INDEX TO BRITISH MEDICAL JOURNAL

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BRITISH MEDICAL JOURNAL

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PRIDE AND PREJUDICE IN THE TREATMENT OF CANCER*

BY

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In eighteen hundred and thirty-three William Wood Bradshaw qualified as a Member of the Royal College of Surgeons of England. He practised at Andover and later at Reading, and was well thought of by the Council of our College, for in 1854 he was elected to the Fellowship without examination, under Clause I of the Charter of 1852. According to various biographies Bradshaw was a student at the Middlesex and Westminster Hospitals, but the only record we possess at the Middlesex is a register which shows that in 1840, seven years after his qualification, he was admitted as physician's pupil.

By the time of Bradshaw's entry at the Middlesex Hospital Charles Bell, the founder of the Medical School, had left on his appointment to the chair of surgery in Edinburgh, but in Erasmus Wilson's history of the hospital we read of others who were on the staff. Among them were Thomas Watson, later President of the Royal College of Physicians, and James Moncrieff Arnott, later President of our College and the benefactor who endowed the Arnott Demonstrations. Francis Hawkins, another member of the staff, was Registrar of the Royal College of Physicians, and his brother, Caesar Hawkins, became President of our College. William Macmichael, the author of the delightful *Autobiography of the Gold-headed Cane*, had recently died, but he had awakened renewed interest in the venerable College of Physicians by directing attention to its past history and to the achievements of the famous men who had been connected with it. Among the other surgeons were Herbert Mayo, who had claimed priority over Bell in his work on the spinal nerves, and Alexander Shaw, Bell's brother-in-law, who was later a Member of the Council of the Royal College of Surgeons. During his time at the Middlesex Hospital, therefore, Bradshaw would be deeply imbued with respect and affection for the two Royal Colleges.

Like many another Middlesex man Bradshaw was a man of piety, as shown by his little book, *Thoughts on the Lord's Prayer*. Like many another Middlesex man he was blessed with a devoted wife, who married him in spite of the fact that her first husband, a rich jeweller of Andover, had jealously tried to prevent her marrying another by leaving his money away in case she re-wed. She showed her devotion to Bradshaw by risking this legacy; together, they showed their sound common sense by buying the reversion for a sum down. In her will Mrs. Bradshaw gave further evidence of her regard for her husband by founding in each of the two Royal Colleges a Lecture to perpetuate his name. This combination of wifely devotion with the "sweet" or "elegant simplicity of the three-per-cents" ensures that each year someone shall occupy this position. In the course of time the appointment of Bradshaw Lecturer has become the highest honour in the gift of the President of our College. I very deeply appreciate the confidence shown in me by entrusting me with this honourable task.

My choice of subject was influenced by various considerations. In the first place, even at the time that Bradshaw came to Middlesex a special department for the investigation and treatment of cancer had been established there for nearly half a century. Bradshaw was also a student of Westminster Hospital, and if he were here in spirit to-day he would find his two hospitals among the foremost in the fight against this dread disease. Moreover, Bradshaw was a general practitioner, and it is on the general practitioner that we rely for the recognition of the significance of symptoms which may lead to the early diagnosis of this disease.

My own path has led me into association not only with the Middlesex Hospital, whose special Department for Cancer Research and Treatment dates from 1792, but also with the Christie Hospital in Manchester, which was founded just a century later. To this latter hospital, now combined with the Holt Radium Institute, I have returned several times, and have seen some of the most successful results of the modern treatment of cancer in certain situations.

This is the fourteenth occasion since the Bradshaw Lecture was founded on which cancer has been chosen as the subject for discussion in our College. It is, however, thirty years, or the conventional length of a human generation, since Sir Alfred Pearce Gould attempted a general survey of the problem. He saw grounds for hope in the fact that in many instances malignant tumours had been observed to disappear under radiation treatment. Towards the end of his lecture he exclaimed, "Watchman, what of the night?" It seemed to me that the circumstances of the present time demanded that someone should pay heed to the answer of the watchman in the Book of Isaiah: "The morning cometh, and also the night: if ye will enquire, enquire ye: . . ." An inquiry into the results of treatment was indeed a matter of urgency. Owing to the war many radiotherapy departments have been partly out of commission and the expert staffs depleted. Large numbers of the population have

* The Bradshaw Lecture delivered before the Royal College of Surgeons of England on November 27, 1940.

been dispersed, continuity of treatment interfered with, and the follow-up of patients made difficult and unsatisfactory.

When I embarked upon my inquiry I found an undercurrent of talk—wild uninformed criticism, a tendency to exaggeration of failures and overstatement of successes. Surgeons and radiotherapists were often in disagreement. There was indeed an atmosphere of "pride and prejudice," frequently the result of "first impressions," which, curiously enough, was the title originally chosen by Jane Austen for her novel. If the pendulum has swung too far away from excisional surgery towards radiotherapy, it is well that it should be so stated in the Royal College of Surgeons. If the swing of the pendulum has been justified by results, it is well that the glad tidings should be welcomed in the headquarters of British surgery.

The present position is that in almost every part of the body except the stomach and intestines the treatment of cancer has become a radiosurgical problem. In the case of the stomach and intestines anatomical conditions are about as favourable as they could be for excisional surgery, provided the disease is diagnosed early. In the stomach excellent results are achieved in early cases. In the streptococcal path of the colon success attends the patient surgeon who will walk delicately like Agag, follow in the footsteps of Paul, adopt the ingenious methods of Seton Pringle, or observe the teachings of our newest Honorary Fellow by conforming to the Devine precepts.

X Rays and Radium

The practice of radiotherapy has grown and is growing at a remarkably rapid rate. This is shown by the increasing number of patients who apply for treatment at the radium centres of the Radium Commission and the Medical Research Council. At the Medical Research Council centres the numbers increased from 1,016 in 1930 to 5,698 in 1938, and in the latter year 60% of patients were having radiation treatment alone—the proportion in general hospitals being 45.5% and in special hospitals as high as 75.9%.

Although man has an inveterate instinct not to confide his weight to a branch until he has tested it, yet in radiotherapy we have for years been using weapons about which we still have much to learn. Terrible mistakes have been made, but there was no help for them. The newfound weapons, however dangerous, simply had to be employed on actual patients, even in an experimental way, because the possibilities of their doing good were so immense. It was one of those instances when, as Trotter said, "In matters that really interest him, man cannot support the suspense of judgment which science so often has to enjoin. He is too anxious to feel certain, to have time to know." It was impossible to maintain an attitude of suspended judgment indefinitely in a matter which might mean life or death to so many—all crying for immediate relief.

When the effects of *x* rays and the gamma rays of radium disturbed established ideas it was inevitable that we should become more and more dependent on more and more division of labour. A division of labour is necessary for the advancement of any science—how much more so in the case of a subject like radiation therapy, which touches so many sciences! As Kipling said, "Isn't it likely that the multitude and significance of the revelations heaped upon us within the past few years have made men in self-defence specialize more and more narrowly? Haven't we been driven headlong to abandon our conceptions of life, motion, and matter? And isn't it human that in the upheaval men may have carried off each his own cherished possession and camped beside it—just as refugees do after an earthquake?" (*A Book of Words*—Speech to the Royal Society of Medicine, November, 1928). So it has happened with the physicist and the radiotherapist, with the result that there is a danger of the surgeon's losing touch.

By specialization, however, the knowledge of what radium and *x*-ray treatment will do has steadily increased. But, as the claims of the beneficial effects of radiotherapy have grown, wiser surgeons have asked that decisions should be deferred and judgments suspended until time had shown whether those benefits were lasting. Surgeons would be failing in their duty if they lightly laid aside the knife or restricted the scope of their operations unless and until they were satisfied that reliable substitutes for radical operative treatment had been made available.

Unfortunately some operations for cancer, although crowned with a large measure of success, entail a heavy primary mortality, and in some cases the resulting mutilation is serious. Radiotherapy acts with greater delicacy, for cancer cells are generally more sensitive than normal cells. The limited tolerance of the skin together with the fact that neighbouring parts may be highly sensitive requires that those who are to use these powerful and dangerous weapons must be very thoroughly trained. Mistakes of the past, now being avoided, showed that in unskilled hands much damage could be done by radiation treatment, and that, like other serious undertakings, it is "not to be enterprised, nor taken in hand unadvisedly, lightly, or wantonly . . . but reverently, discreetly, advisedly, and soberly."

Experimental Cancer

Before considering the results of treatment it is well to call to mind the present state of our knowledge, for this is an essential starting-point for further developments. We still do not know the cause of the disease we are striving to cure, but the results of research lead to the conclusion that there may be a combination of three factors in the induction of an experimental cancer. First, there is an inherent susceptibility or lack of resistance in the individual. Secondly, there may be an irritant, or non-essential, factor: one example of this is the characteristic reaction produced in the skin by the application of a chemical carcinogen, and another is the change produced in the breasts of susceptible animals like mice by overstimulation with large doses of natural or synthetic oestrogenic substances. And, thirdly, there may be a virus as a causative agent, and this may or may not be an essential element.

Research on viruses leads to the very meeting-place between animate and inanimate matter—to the threshold of life itself; for some known viruses seem capable of passing from an inanimate crystalline form to an animate existence. Ideas as to the nature of viruses are conflicting. Some observers regard them as extraneous disease-producing entities, while others maintain that viruses are formed from the protoplasm of the animal cell. Some workers doubt the virus theory and maintain that chemical agents may be sufficient by themselves to induce cancer in a susceptible animal. But, in support of a virus factor in cancer, it must be remembered that tumours have been transmitted from one animal to another by means of a cell-free filtrate, and also that there is evidence suggestive of the development of antibodies (neutralizing and agglutinating immune bodies) in the blood of the host, which raises hopes that a way may be found to stimulate the process of natural resistance.

The occurrence of some cases of experimental cancer is definitely associated with external influences. This is made clear by the demonstration that cancer can be

induced almost at will, that the rate of induction by an extraneous carcinogen can be delayed or accelerated, that the incidence of mammary cancer of hormonal origin can be influenced by environment, and that even the incidence of susceptibility can be modified, for it seems to depend more on some factor in the milk received from the mother or foster-mother than on parentage. In experimental cancer many of these causative factors may be brought under control.

The Problem in Man

Passing from mice to men, there are grounds for believing that the incidence of cancer in the human subject may also be governed by an inherent susceptibility or lack of resistance and, possibly, also by a virus. But in addition to these causes, which we cannot at present control, general environmental factors, such as occupation or social conditions, may play some part in the causation, and there is ample evidence that totally extraneous influences affecting the skin or the respiratory, urinary, or alimentary tract are often local non-essential causes. These extraneous influences may be subject to control.

Experimentalists and clinicians, however, are alike faced with the fact that, whatever causes may combine to produce cancer, once the cancerous cell has developed the malignant growth continues, in spite of the withdrawal of any remote non-essential cause. Various lines of research suggest many possible lines of treatment, but in the present state of our knowledge we can only treat the local manifestation of the disease.

We have not the requisite knowledge to guide us in controlling susceptibility or increasing resistance, nor do we know any general treatment which will arrest the disease process when it has begun. By way of prevention we can, however, do much to exclude extraneous influences which may be remote causes, and we can treat local and general conditions which are known to be frequent precursors of cancer. By way of cure we can attack the cancer locally when it is manifest. This can be done by surgical excision, to which there are limits, or by endeavouring to check an otherwise irreversible process by radiation, a method the full possibilities of which have yet to be learned. There is still an enormous amount of research to be done in radiotherapy, but thanks to the physicist we have now a standard unit of dosage, and with the help of the physicist we can direct the rays accurately and determine the exact dose received by the skin, by the tumour, by the surrounding tissues, and by the individual. But the same dose can be varied in many ways—e.g., in intensity, in time spacing, and in the source of radiation. Moreover, in addition to the physical variables we still have to consider the problem of sensitivity and the different effect produced on the same cells according to the activity or otherwise of mitosis, or the state of nutrition of the cells and, possibly, of the individual. There are favourable times and conditions for radiation treatment, and it is anticipated that if it could be spaced so as to attack the tumour always at times of high radiosensitivity, and to avoid times of high radioresistance, better results would be obtained.

Morbid Histology

The importance of the state of cell activity and its relation to treatment and prognosis has awakened renewed interest in the study of morbid histology, which is by no means so closed or finite a subject or so unprofitable a line of research as many have imagined. The relationship between histological appearance and prognosis has been demonstrated in all the squamous-celled carcinomata, in cancer of the breast, cervix uteri, intestines, and rectum. But the histological grading of tumours, based on the extent of differentiation of the cells and the degree of cell activity, in addition to aiding in the assessment of prognosis may help in deciding on the best line of treatment. If a specimen has been obtained for biopsy the pathologist may have to accept not only the task of exact diagnosis but the additional responsibility of sharing in the decision whether the tumour should be excised, or whether surgical intervention may precipitate disaster; or whether it is of the type that is likely to react favourably to radiation. If a specimen removed by radical operation is submitted for an opinion the pathologist, after careful examination of the whole specimen and after histological grading, may have to help to decide not only the prognosis but also whether post-operative radiation is indicated. It is by these and similar exact scientific investigations in the study of each individual case that results of treatment are likely to be improved; for, as Sir James Paget said in 1882 in the first Bradshaw Lecture ever delivered in our College, "Better treatment will follow better diagnosis, and better diagnosis will certainly follow a more exact pathology."

Early Diagnosis

Morbid histology is one of the important aids not only to exact diagnosis but also to early diagnosis, which is essential to success in cancer treatment. The study of histology may help to reveal, as Paget pointed out, "the time and manner of the first appearing in the case of many diseases."

The master key to success in the treatment of cancer is early diagnosis, and the first step towards this is to secure the opportunity to examine the patient. We must therefore endeavour to remove the haunting fear of the disease. Patients must be brought to realize that cancer is curable and thus led to seek advice without delay. The fact that there is an alternative to operative treatment is a help in leading patients to seek advice early, and indeed has already led to this happy result, as the experience of some radium centres proves.

Now that therapeutic apparatus is so complicated, so costly, and so quickly out of date institutional treatment will become more and more necessary. This will help to dispel the atmosphere of secrecy such as prevailed in the case of President Cleveland when, as dramatically related by Keen of Philadelphia, surgeons were smuggled on to the President's yacht lest during the bimetallism crisis in the United States there should be a financial panic if it were known that he had a malignant growth. (W. W. Keen: *The Surgical Operations on President Cleveland in 1893.*)

The next important step to early diagnosis is skill in clinical investigation, and great advances have been made in methods of examination which can help towards this end.

Results of Treatment

I now propose to attempt a survey of my inquiry into the results of treatment. The opinions I have arrived at must be considered as personal ones. At the same time I have attempted to reach them with a full sense of responsibility, for a Bradshaw Lecture may be vested with some authority, and may be taken to represent an *ex cathedra* statement of the present position. I have endeavoured to avoid bias and to hold a brief neither for surgery nor for radiotherapy, but only for the patient.

In assessing results I have confined myself to a study of those achieved in this country, and as a rule have drawn comparisons between the best obtained by surgery and the best obtained by radiation therapy. I have made no attempt to compare the results of different methods of using radiation as a therapeutic agent; for although it is claimed that methods of treatment have been largely stan-

dardized, yet it has to be admitted that ingenuity in inventing techniques has been so prolific that the different combinations of methods of treatment may be called legion, for they are many. In fact, in a recent report of the Radium Commission it was stated that 110 different combinations had been distinguished for the tongue, 53 for the floor of the mouth, 86 for the breast, 56 for the lip, and 66 for the uterine cervix. Truly a bewildering variety! Technique and clinical judgment count for as much in radiotherapy as in surgery.

The introduction of a new radiological method is likely to lead to excessive enthusiasm, but unfortunately this is often damped by the sobering effect of a cold douche of statistics showing results some years afterwards. Although in the last analysis it is numbers that count, statistics are often misleading and are open to abuse. The study of cancer statistics is very difficult, for there has been no uniform system of keeping records or estimating results. Even when statutory and other bodies have collected information they have acted independently and, as if inspired by some imp of mischief, have adopted different methods of arriving at survival rates. For statistical study it is essential to have uniformity of method. But even when cancer statistics are compiled on identical lines they are often not suitable for comparison, for cases may differ in character in different clinics and there is a personal factor in classifying cases into stages or into operable and inoperable. I have attempted, therefore, to compare results statistically only when numbers, conditions, class of case, and other factors could be reduced to a common denominator and a fair comparison be made.

The Skin

Cancer of the skin is essentially a local disease when first manifest, and even in cases of epithelioma the lymphatic glands are not involved as a rule until the disease is far advanced. Over 90% of 800 cases analysed by the Radium Commission had no glandular metastases when first seen. It is interesting to note, however, that a superficial skin cancer, whether basal-celled carcinoma or epithelioma, is often an outward and visible sign of an inward invisible delitescent and unexplained tendency, for it is by no means uncommon for patients with skin cancer, particularly rodent ulcer, to develop carcinoma elsewhere. In the Radium Commission analysis of 2,534 cases of rodent ulcer 2.1% are reported to have had some other form of cancer before, after, or concurrently with the rodent ulcer. Moreover, multiple rodent ulcers were quite common, over 8% of the patients having more than one (Report of Radium Commission, No. 5883, 1938). At the Middlesex Hospital, where careful note has been kept on this point, 32 out of 671 cases of rodent ulcer, or 4.8%, have had cancer elsewhere, excluding epithelioma of the skin.

It is well known that radiation will cure a large proportion of cases of skin cancer. In some respects this knowledge may be regarded as unfortunate, for many cases are sent direct to the radiotherapist and no other form of treatment is seriously considered. Just as in cancer in other situations, however, a case of cancer of the skin requires to be the subject of joint consideration by surgeon and radiologist. Surgical excision is still the treatment of choice in the case of a small primary lesion when removal can be secured without disfigurement or mutilation. It must also be remembered in this connexion that while recurrences of rodent ulcer are always resistant to radium treatment they are more so after radiotherapy than after excision. Surgery should also be resorted to if the response to radiation is disappointing, and often if the disease has already produced a large defect, for then the surgeon should have the opportunity to remove the growth and plan his line of repair before the healing powers of the tissues have been damaged by radiation. In each case careful consideration should be given as to which treatment will be most successful and least exacting. All circumstances should be taken into account—age and general condition of the patient, as well as the local anatomical problem.

The treatment of *naevo-carcinoma* has been disappointing to surgeon and radiotherapist alike. The extreme malignancy of naevo-carcinomata when they occur on skin or mucous membrane is well recognized. For this reason prophylactic operation by wide excision is indicated when a mole is so situated as to be liable to irritation by pressure or friction. Contrary to general belief many of these tumours are radiosensitive, and it is advisable to try the effect of radiation in all cases. Surgical removal still offers the best chance, however, and successful results have been obtained by removing the whole of the lymphatic drainage area at the time of removal of the primary growth.

The Lip

In cancer of the lip a five-year freedom rate of nearly 65% of all cases can be obtained by radiation and of nearly 90% in Stage I cases. This is as good as or better than surgery, and healing is often obtained without loss of substance. The prognosis depends on the size of the lesion, its site, duration, and whether any glands are involved. In the case of a large, deep, infiltrating epithelioma of the lip, when a considerable defect is inevitable, early surgical excision with plastic repair should be seriously considered. Surgical excision should also be employed when it is clear that a case is not responding to radiation treatment. Neck dissection is required for the lymphatic areas, but only if glands are palpable, for it has been found at the Christie Hospital that in 80% of gland-free cases in which the primary lesion can be made to heal no glandular involvement has occurred. (Christie Hospital and Holt Radium Institute—Five-year Statistical Report, 1939.)

Mouth and Throat

Discussion of cancer of the mouth and throat awakens affectionate memories of Wilfred Trotter and will always evoke a tribute of admiration for his work. If another lateral transthyroid pharyngotomy were never performed we should still owe an immense debt to Trotter, not only for the lessons he taught in operative technique but also for his contributions to what Clifford Allbutt called "the pathology of the living."

Trotter's attitude towards the question of surgical or radiation treatment for cancer of the mouth and throat is expressed in the following statement which he made a few months before his death: "It is a harmful misconception that radiotherapy has already wholly superseded primary radical excision of the disease. That it will ultimately do so we all hope, that it has already done so in large part we all know; but this aspiration and this knowledge leave untouched the fact that, at the present time, there are many cases, easily recognized by the experienced, in which primary operative excision offers by far the most substantial hope of cure." (Unpublished discussion at the Conference of the British Empire Cancer Campaign, 1939.)

Oral Cavity

In the oral cavity radiation has in fact largely superseded radical excision in the treatment of the primary lesion. In recent years at the Middlesex Hospital over 60% of these cases have received radiation treatment only.

In cancer of the cheek, the palate, the floor of the mouth, and the fauces the results of radiotherapy justify the drift from surgery. They are as good as those

obtained by excision and are often secured without mutilation or disfigurement.

In this region as well as in the larynx and pharynx and posterior third of the tongue, we must await the outcome of the radium beam therapy research which has been fostered by our College. The results so far are very encouraging, and in some cases remarkable, but they have still to stand the test of time.

The Tongue

In cancer of the tongue there are fairly comparable figures to help us statistically to assess the value of surgery and radiation treatment. The name of Whitehead of Manchester (not Liverpool as stated in the standard work on *Diseases of the Tongue*) naturally comes to mind in the history of surgical treatment in England, and Sir Henry Butlin, one-time President of our College, set a standard of success which it is often stated has never since been reached by surgery. It has also been stated that it is unsurpassed by radiation treatment, but, as will be seen in Table I, this is not borne out by a comparison of Butlin's results with those of the Christie Hospital.

TABLE I.—*Comparative Tables of Results from Operation and Combined Radiation and Operation for Carcinoma of the Tongue*

Evaluation of Sir Henry Butlin's operation results: Lived for from five to twenty-two years free from recurrence.

Stage	No. of Cases Treated	Net Five-year Freedom Rate
I II III	154	43 (27.9%)
IV	0	Inoperable

(*British Medical Journal*, 1909, 1, 1)

Christie Hospital and Holt Radium Institute: Cases treated in 1932 and 1933.

Stage	No. of Cases Treated	Net Five-year Freedom Rate
I	48	26 (54.1%) } = 45.8% } = 30.8%
II	24	7 (29.1%) }
III	58	7 (12%)
IV	21	0 Inoperable
Total	151	40 (26.4%)

(Five-year Statistical Report—Christie Hospital and Holt Radium Institute, 1939.)

The net survival rate in both tables is calculated after deducting the numbers not traced, those dying from intercurrent disease, and those in whom operation was incomplete.

Stage I = small primary growth, not more than 3 cm.—no glands.
" II = primary spread beyond tissue of origin—still no glands.
" III = ditto—but with glands.
" IV = extensive advanced cases—inoperable.

Net freedom rates are not altogether satisfactory, but they are the only comparable figures in this instance. Butlin's general five-year figure, based on cases traced from five to twenty-two years, is 1.5% better than that of the Christie Hospital for all cases treated, but for the operable cases the rate at the Christie Hospital is 3% better than Butlin's, and we must remember the mutilation and disability resulting from extensive operations in this situation. The conclusion I have come to is that, with the exception of small lesions, recurrences, syphilitic tongues, cancer on leucoplakic areas, and lesions involving bone, radiation treatment of the primary tumour and operative removal of the lymphatic area, if and when the glands become palpable, is the treatment which gives the best prospect of cure.

The choice between surgical and radiation treatment in an individual case may depend on various considerations, such as the site and extent of the primary lesion, and also on the histological type of the tumour. Surgery and radiation are equally successful in small lesions, and surgery may often be indicated—for example, in small lesions of the tip and side of the tongue if the organ has not lost any mobility. We have all had experience of complete cure in such cases. I personally recall a case of hemi-glossectomy for early carcinoma of the tongue in which, in 1905, I assisted the late Sir William Thorburn. The patient lived for thirty-two years without recurrence and held many important positions requiring much public speaking.

Butlin performed a block dissection of the neck as a routine in his later cases. The general plan at the Christie Hospital and Holt Radium Institute is to treat the primary lesion by radiation and proceed to block dissection of the neck if glands are palpable. At one time a block dissection was carried out as a routine procedure, but the mortality of the operation is about 10%, and 68% of all gland-free *mouth* cases did not get any glandular involvement within five years, and *about half the gland-free tongue cases were still gland-free* at the end of five years. Cases without palpable glands are therefore watched carefully and at once submitted to operation if any glands become palpable.

(*The conclusion of the lecture will appear in next week's issue.*)

RECTAL HEXOBARBITONE SOLUBLE

A USEFUL FORM OF BASAL ANAESTHESIA

BY

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The use of hexobarbitone soluble (syn. evipan, cyclonal sodium, etc.) per rectum as a *basal* anaesthetic was first described by Gwathmey in 1936. Subsequently Hogan (1938) published a report of 200 cases of rectal hexobarbitone soluble used as a *total* anaesthetic. Apart from these instances the method does not seem to have been employed by many workers. We therefore decided to try out its application as a *basal* anaesthetic, especially in comparison with avertin, to ascertain its field of suitability in general surgery. The following technique has been evolved from experience gained in over 250 administrations in which hexobarbitone soluble was used per rectum as a basal anaesthetic.

Practical Considerations

We have three main routes at our disposal for the administration of a basal anaesthetic: the oral, the intravenous, and the rectal.

Oral.—This is the simplest method of administration, but in practice it has been found to be unreliable owing to unpredictable variations in the rate of absorption.

Intravenous.—This is the most accurate method, as the dosage can be adjusted during administration according to the patient's reactions. It suffers, however, from the fact that the administration must be carried out by the anaesthetist himself, which as a rule limits its use to the anaesthetizing room. The nervous patient thus loses one of the chief advantages of basal anaesthesia—namely, complete oblivion of his journey to the operating theatre. In addition the effect of a drug administered intravenously is more transient than when given by other routes.

Rectal.—The chief advantages of this route are (1) a fairly even rate of absorption, giving rise to a comparatively constant and prolonged level of narcosis, and (2) the ease of adminis-

tration. The method can soon be taught, and entrusted, to any intelligent nurse.

Most drugs used for rectal administration (e.g., paraldehyde, avertin) require the addition of a comparatively large volume of fluid for dilution. The injection of this large volume into the rectum may cause reflex expulsion, especially in children and nervous patients, unless the solution is run in very slowly by an experienced nurse. Even then "accidents" may occur. Ejection is more likely to happen if the patient has not had his rectum emptied by a preliminary enema, which should have been given not less than eight hours previously. Rectal hexobarbitone, on the other hand, is administered in such a small volume of solution (20 to 30 c.cm.) that its rejection is extremely uncommon: we have not yet had a single case in which this has occurred, even in young children. This is of considerable advantage in dealing with emergency operations. Another advantage is that tests for decomposition of the solution are not necessary as with avertin.

Technique and Dosage for Adults

A preliminary enema to clear the rectum is not required. The patient is weighed; if this is not possible a rough estimate is made. We have found the latter procedure to work satisfactorily in practice, as the dosage of rectal hexobarbitone recommended in adults allows quite a wide margin of error with safety (Hogan, 1938). Accuracy is not essential, since an error of 0.5 gramme either way in the total can be allowed with safety in healthy adults. The dosage varies according to whether there has been premedication with atropine only or morphine or omnopon has been given in addition:

(*a*) When atropine is the sole premedication (e.g., 1/100 grain) the patient's actual or estimated weight in pounds is multiplied by 0.02. The result gives the number of grammes of hexobarbitone soluble to be administered in warm tap-water.

(*b*) When there has been premedication with morphine and hyoscine (or atropine) or with omnopon–scopolamine (e.g., morphine 1/6 grain and hyoscine 1/150 grain one and a half hours before operation) the patient's weight in pounds is multiplied by 0.01 to 0.015 according to his type, age, and condition. The result gives the number of grammes of hexobarbitone soluble required. When morphine or omnopon has been given as premedication the basal narcosis produced is more satisfactory and is less likely to be followed by postoperative restlessness.

To prepare the solution the ampoules of hexobarbitone soluble are opened and each gramme is dissolved in roughly 10 c.cm. of warm tap-water. An hour before the operation the patient is turned on to his left side and made as comfortable as possible. A pillow behind him helps to prevent him from rolling on to his back when asleep. He is then told that a "couple of tablespoonfuls" of solution will be introduced into his "back passage," that he will have no difficulty in retaining it, and that it will soon send him to sleep. The solution is placed in a funnel, which is connected direct (as small a dead space as possible) to a suitable size of soft rubber catheter, the end of which is lubricated with vaseline. Any air is expelled by allowing the solution to fill the catheter, which is then pinched one to two inches from the end to be inserted. The catheter is gently inserted two to three inches into the rectum and the solution is allowed to run in *quickly*. A small additional amount of tap-water, say, about 10 c.cm., is run in to clear the catheter, which is removed immediately. The whole procedure takes not more than five minutes. Sleep usually comes on within twenty minutes and lasts for four to five hours. During the period of unconsciousness the patient responds to painful stimuli if the dosage has been correctly estimated. Respiration is quiet but not unduly depressed. The unconscious patient must be watched by the nursing staff and the usual attention paid to the maintenance of a clear airway. If necessary an artificial airway must be introduced. To prevent his tongue falling back it is advisable to keep the patient on his side till he arrives in the anaesthetic room. This position is also desirable after operation until the patient has recovered the control of his own airway. We have no objection to the adoption of this position after any type of operation, including abdominal operations.

Technique and Dosage for Young Children

For children of 10 months and upwards we use atropine alone or combined with a small dose of nepenthe as premedication. The nepenthe is desirable if the child is to have a local anaesthetic. The patient's weight in pounds multiplied by 0.02 gives the required dose in grammes of hexobarbitone soluble. The child must be weighed *accurately*, and the solution, in contradistinction to that in the adult technique, must be made up correctly by means of a 10-c.cm. syringe, which is connected direct to a small soft rubber catheter, no funnel being employed. The catheter is then gently inserted into the rectum for an inch or so, but the injection of the solution is not begun until the child has been soothed and his attention diverted from the procedure. The administrator may then inject the solution cautiously, being ready to stop temporarily if the child shows signs of straining. When the injection has been completed the catheter is cleared by means of a few cubic centimetres of warm tap-water. It is then clamped and left *in situ* until the child is asleep, as immediate withdrawal may cause rejection of the fluid. As in adults, the lateral position must be insisted upon until the child reaches the theatre.

Clinical Application

We have used the method outlined above on more than 250 cases, some of which have been classified as follows to show its varied uses.

Surgical Procedure	Age Limits	No. of Cases	Supplementary Anaesthesia	Comments
Vaginal repair, and colpo-perineorrhaphy	32–66	12	Open ether. N_2O & O_2. C_3H_6 & O_2	Respiratory and circulatory depression in one patient after unnecessary depth with ether
Excision of adenoma of thyroid	30–53	8	N_2O & O_2. C_3H_6 & O_2	Longer recovery period is here a disadvantage
Inguinal herniorrhaphy	1.5/12–56	33	N_2O & O_2. Open ether. Field block	
Partial gastrectomy	28–62	25	N_2O & O_2. C_3H_6 & O_2. Field block with splanchnic block	
Gastro-enterostomy	38–59	13	N_2O & O_2. C_3H_6 & O_2. Field block with splanchnic block	
Amputation of leg ..	50–67	5	C_3H_6 & O_2	All patients with gangrene: four diabetic, one traumatic
Appendicectomy ..	8–68	66	Open ether. Warmed ether. N_2O & O_2. C_3H_6 & O_2. Field block	Respiratory and circulatory depression in one patient after unnecessary depth with ether. A number of emergency cases are included here
Radical amputation of breast	38–62	9	N_2O & O_2	
Mastoidectomy ..	4–42	10	N_2O & O_2. C_3H_6 & O_2	
Change of plaster ..	10–52	26	Nil	One case became restless in theatre and required some N_2O & O_2
Toilet of burns in children	3–12	17	N_2O & O_2 required in some cases	

Advantages and Disadvantages of the Method

Advantages.—(*a*) There is usually complete amnesia of the journey to and from the theatre and for some hours afterwards, even if the patient has had a small dosage and has appeared only drowsy on arrival in the anaesthetic room. (*b*) Less inhalation anaesthetic is required. (*c*) The incidence of post-operative vomiting seems to be less than when inhalation anaesthesia is used alone. (*d*) Compared with avertin, hexobarbitone soluble is easy to prepare and administer and rejection does not occur. (*e*) The method is very suitable for combination with local infiltration and field-block anaesthesia. When injecting a local anaesthetic into a patient under this form of basal narcosis the limbs should first be strapped down, as the patient is liable to move in response to the needle prick. The fact that barbiturates in general protect the patient against toxic effects of local anaesthetics is an additional advantage when using this combination. (*f*) The above advantages, especially ease of preparation, make it suitable for Service patients under war conditions

Disadvantages and Untoward Effects.—The only untoward effects we have observed have been as follows: (*a*) Restlessness in a few patients. This has not been severe and has been easily controlled by the attendant nurse. It rarely occurs if an opiate has been included in the premedication. (*b*) In only two cases has undue respiratory and circulatory depression been seen in patients premedicated with morphine; these were given an unnecessarily deep ether narcosis following a full dose (e.g., 0.2 gramme per pound body weight) of rectal hexobarbitone. Since we have gained more experience in dosage we have not seen this complication. The above patients responded to intravenous coramine and inflation with oxygen. (*c*) The length of the period of post-operative unconsciousness. This might be a disadvantage in certain cases, such as when fluid therapy by mouth is indicated as soon as possible after operation—e.g., partial thyroidectomy, etc.

The contraindications are those which apply to basal anaesthesia in general.

Summary

More than 250 patients undergoing various surgical procedures have been given rectal hexobarbitone as a basal anaesthetic followed by various forms of supplementary anaesthesia. Our experience suggests that the method is a satisfactory and easy way of producing basal narcosis.

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The Government's proposal to fortify white bread by the addition of vitamin B_1 and calcium to flour is an acknowledged compromise on the subject of brown *versus* white bread for public consumption, and the Food Education Society, which has done much over many years to educate the public on food values, views the proposal with misgivings. The society has therefore published a pamphlet entitled *Bread in Peace and War*, in which is collected much of the material that has appeared in scientific journals and the lay press on this subject and also in the columns of *Hansard*. The pamphlet opens with reports of four conferences on whole-wheat bread, which the society arranged, and the subsequent material, which is taken from a wide variety of sources—the columns of the *Journal*, the correspondence columns in the *Times*, the writings of Professor J. C. Drummond, Sir Robert McCarrison, and Dr. L. J. Picton, and even from a report of a conversation with an "interested party," a baker—presents a convincing case for the introduction of a wholemeal loaf and not a reinforced white one. The booklet should serve as a *vade mecum* for members of Parliament and of the medical and dental professions, for social workers and practical housewives. It can be obtained from the Food Education Society, temporary address, 27, Denning Road, N.W.3, price 2s. 6d.

THE EFFECT OF POTASSIUM SALTS ON CARDIAC IRREGULARITIES *

BY

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The use of potassium salts to check attacks of paroxysmal ventricular tachycardia and to prevent the occurrence of auricular and ventricular ectopic beats was reported by Sampson and Anderson (1930). In 5 cases out of 12 they were able to control the arrhythmia. The same workers (1932) later published their observations on 58 further cases, in 50% of which auricular or ventricular ectopic beats or tachycardia were checked for varying periods by an oral dose of a potassium salt of from 1 to 16 grammes. In several of their patients the arrhythmia could be permanently controlled by a maintenance dose of a potassium salt. Five different salts of potassium were used—the chloride, iodide, bromide, citrate, and acetate—all with apparently identical effects.

Extrasystoles after Injection of Adrenaline and of Insulin

The appearance of extrasystoles after an injection of adrenaline is a well-known phenomenon, and when it was shown that this substance causes a fall in the serum potassium level in man (Castleden, 1938; Allott and McArdle, 1938), the possible connexion between these phenomena and the work of Sampson and Anderson seemed worthy of investigation. At the same time the effect of potassium salts was tried upon patients who had spontaneous extrasystoles.

Adrenaline.—Of 18 subjects, aged from 21 to 71 years, who received an injection of 1 mg. of adrenaline hydrochloride intramuscularly 8 produced extrasystoles; but these varied in number per minute and were usually too transient to be useful for testing the effect of potassium in preventing them. In one of these subjects—who fairly regularly had 4 or 5 extrasystoles per minute, beginning at 16 and lasting till 24 minutes, after an injection of either 0.5 or 1 mg. of adrenaline hydrochloride—they were not abolished by an oral dose of 6 grammes of potassium chloride given one hour before they were due. In another, who had about 17 extrasystoles per minute, beginning at 4 and lasting until 29 minutes after receiving 1 mg. of adrenaline hydrochloride, they were reduced to 4 per minute by 6 grammes of potassium chloride orally one hour before they usually appeared.

It was considered that for the experimental production of extrasystoles adrenaline hydrochloride was too inconstant and unreliable a method for proper controls to be obtained.

Insulin.—Insulin by subcutaneous injection, sugar by mouth, or both together have been shown to cause a fall of serum potassium level (Aitken, Allott, Castleden, and Walker, 1937; Allott and McArdle, 1938; Harrop and Benedict, 1924; Kerr, 1928). It was of interest, therefore, when a female diabetic patient, aged 52, who was difficult to stabilize, was found to have attacks of extrasystoles during her periods of hypoglycaemia. When she was stabilized the following experiments were performed:

On May 25, 1938, at 11 a.m., her resting cardiac rate on auscultation was 65 per minute and perfectly regular, no extrasystoles being present. The blood sugar was 90 mg. and the serum potassium 18.2 mg. per 100 c.cm. At 11.30 a.m. she received her usual dose of 15 units of insulin, the meal due at 12 noon being omitted. At 12.25 p.m. a typical hypoglycaemic attack was beginning and there was an average of 10 extrasystoles per minute, counted over a long period. The

* This work was done at the British Postgraduate Medical School during the tenure of a Medical Research Council Fellowship.

blood sugar at this time was 70 mg. and the serum potassium 14.2 mg. per 100 c.cm. Glucose orally relieved the hypoglycaemia, but extrasystoles persisted for some time afterwards.

On May 28 at 11 a.m. the cardiac rate was 64 per minute and regular, no extrasystoles being present. Blood examination showed a sugar content of 112 mg. and a serum potassium level of 18.4 mg. per 100 c.cm. A dose of 6 grammes of potassium chloride was given orally at 11.10 a.m. and the usual dose of insulin at 11.30 a.m., the midday meal being omitted as before. At 12.20 p.m. hypoglycaemic symptoms were present and the apical rate was 75. There were no extrasystoles. Blood sugar at this time was 66 mg. and the serum potassium 20.1 mg. per 100 c.cm. Glucose by mouth relieved the hypoglycaemia, and no extrasystoles were observed up to the end of the experiment at 2 p.m., when the blood sugar was 170 mg. and the serum potassium 23.6 mg. per 100 c.cm.

Spontaneous Extrasystoles

Case 1.—A man aged 83 was admitted in cardiac failure due to hypertensive heart disease and auricular fibrillation, with completely irregular rhythm. An electrocardiogram showed auricular fibrillation with a slow ventricular rate and many ventricular extrasystoles. A dose of 6 grammes of potassium chloride was given orally, and 32 minutes later the ventricular extrasystoles were abolished. Four hours after the administration of the potassium chloride the extrasystoles began to return.

Case 2.—A woman aged 61, admitted with hypertension and cardiac failure, was observed to have continuous pulsus

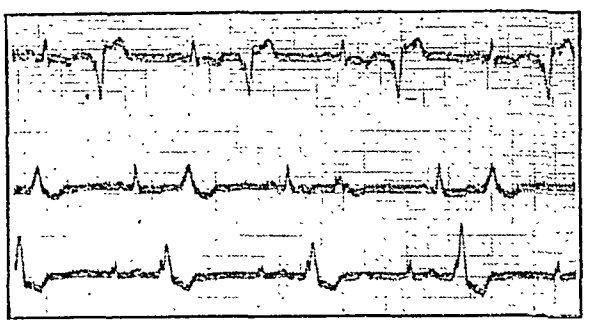


FIG. 1.—Electrocardiogram of Case 2 before administration of potassium chloride.

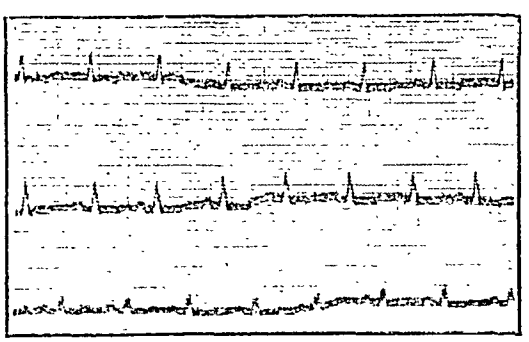


FIG. 2.—Electrocardiogram of Case 2 after administration of potassium chloride.

bigeminus a few days after admission. This was at first thought to be due to digitalis intoxication, but after omission of this drug the coupling continued (Fig. 1). A dose of 2 grammes of potassium chloride orally had no effect on this rhythm. A dose of 4 grammes reduced the number of extrasystoles from 48 to 20 per minute, and 6 grammes orally abolished them entirely for two hours (Fig. 2).

Case 3.—A woman aged 56, suffering from rheumatoid arthritis, regularly had 13 to 18 extrasystoles per minute. A dose of 3 grammes of potassium chloride orally abolished these, the effect being observable at 25 and lasting till 175 minutes after the dose. On another occasion the number of extrasystoles was 13 per minute and the serum potassium was 21.1 mg. per 100 c.cm. A dose of 4 grammes of potassium chloride orally raised the serum potassium to 28.1 mg. per 100 c.cm. in 48 minutes and abolished the extrasystoles from 18 minutes after it was taken until 2¼ hours later, when there were 3 extrasystoles per minute and the serum potassium had fallen to 22 mg. per 100 c.cm.

Case 4.—A man aged 43, suffering from dyspepsia, was observed to have 10 to 12 extrasystoles per minute constantly. The serum potassium was found to be 16.5 mg. per 100 c.cm., and 6 grammes of potassium chloride was given orally. The number of extrasystoles progressively diminished until one hour after the dose none was observed. At this point the serum potassium had risen to 23 mg. per 100 c.cm. The effect of the potassium persisted for a further two hours, when extrasystoles began to make their appearance again, and the serum potassium level had fallen to 19.5 mg. per 100 c.cm. This man was then put upon a maintenance dose of 2 grammes (30 grains) of potassium chloride three times a day orally, and during the time he was taking this he had no extrasystoles.

Extrasystoles after Ephedrine

An asthmatic woman aged 29 was found to have extrasystoles on the day following a dose of 1/2 grain of ephedrine by mouth, given during the preceding night for an attack. She stated that this drug gave her palpitations, her own doctor having advised its discontinuance for this reason. A first dose of 1/2 grain by mouth was found to cause a fall of serum potassium from 17.7 mg. per 100 c.cm. before the dose to 15.8 mg. four hours after, no extrasystoles occurring during that period. A further test dose of 1 grain by mouth caused the serum potassium to fall from 18.2 mg. to 14.2 mg. per 100 c.cm. in two hours. There were again no extrasystoles, but the patient complained of consciousness of the heart's action. On examination the heart was overacting; the resting rate had increased by 10 beats per minute, and the pulse pressure by 15 mm. Hg, chiefly by a fall of diastolic pressure.

One subject who refused to have samples of blood taken consented to an intramuscular injection of 1/4 grain of ephedrine, following which he had a pronounced elevation of systolic blood pressure with numerous extrasystoles for two hours. These observations make it all the more unfortunate that his serum potassium could not be estimated.

A further series of tests to determine the effect of ephedrine on the serum potassium level was therefore made. It was found that this substance, in contrast to adrenaline (Castleden, 1938), did not always produce a fall in the serum potassium level. It was also found to be more inconstant than adrenaline in the production of extrasystoles, and sometimes failed to produce the rise of blood pressure which is to some degree a constant effect of adrenaline (see accompanying table).

Discussion

Ever since the classical experiments of Ringer (1882, 1883) it has been realized that the presence of potassium

Table showing Effect of Ephedrine on the Serum Potassium Level

Experiment	Age of Subject	Resting Serum K (mg. per 100 c.cm.)	Dose of Ephedrine in grains	Serum Potassium Levels in mg. per 100 c.cm. at the Following Hours after Ephedrine								Remarks
				½	¾	1	1	1½	2	3	4	
1	29	17.7	0.5 (O)								15.8	No E.S. No change in B.P.
2	29	18.2	1.0 (O)						11.2			No E.S. Slight rise of B.P.
3	45	20.6	0.5 (O)						18.6		20.6	No E.S. No change of B.P.
4	38	17.3	0.5 (I.M.)		20.7		17.3	19.3	18.4	20.8		No E.S. Pallor and marked rise of B.P.
5	30	16.5	0.5 (I.M.)	17.6	17.1	17.6	20.3					No E.S. No change of B.P.

O=Oral I.M.=Intramuscular E.S.=Extrasystoles.

was necessary to the proper functioning of heart muscle. Ringer showed that full relaxation of the heart muscle in diastole did not occur in the absence of potassium, that potassium increased the latent period of the response to stimuli and lengthened the refractory period, and that an excess of it caused a cessation of the heart-beat in diastole. He further showed that all these actions were the opposite of those produced by calcium, a proper balance between this element and potassium being necessary to the normal functioning of heart muscle.

Since then a great deal of experimental animal work has been done on this subject. Gross (1903) found that calcium increased the strength of cardiac contraction, lengthened systole, and decreased the sino-auricular nodal rate. Von Egmond (1913) showed that calcium increased the auriculo-ventricular conduction time and tended to produce spontaneous auricular and ventricular ectopic beats. Excess of calcium has also produced auricular and ventricular fibrillation (Rothberger and Winterberg, 1911; Hofmann, 1915).

Gross (1903) and Hofmann (1915) showed that potassium diminished the strength of cardiac contraction, shortened systole, increased the sino-auricular nodal rate, and lengthened the auriculo-ventricular conduction time in animals. Hering (1903) was able to stop paroxysmal ventricular tachycardia and ventricular fibrillation by the intravenous injection of potassium salts in the dog, and many other examples of the arrest of auricular or ventricular ectopic rhythm by this means are on record (Rothberger and Winterberg, 1911; D'Halluin, 1926; Wiggers, 1930). These workers and Norn (1929) have shown that the chloride, citrate, and acetate of potassium can be taken by man in oral doses of 1 to 15 grammes without danger, and that 10 c.cm. of a 1% solution could be given intravenously without ill effect. They have also shown that potassium salts are fairly rapidly absorbed from the alimentary canal, the maximum rise of serum potassium being observed in from three-quarters of an hour to two hours after ingestion, which agrees with our own observations (Aitken *et al.*, 1937). Potassium salts are rapidly excreted except in renal failure, which seems to be the only contraindication to their use (Smillie, 1915; Wilkins and Kramer, 1923; Rabinowitch, 1925; Cushny, 1917).

The cases recorded in this paper confirm the work of Sampson and Anderson, which seems to have attracted little attention in this country, and the work on insulin, adrenaline, and ephedrine indicates that it is possibly the fall of serum potassium which causes the well-known phenomenon of extrasystoles to appear after their therapeutic use and suggests that the oral administration of a potassium salt would sometimes eliminate this action where it occurs.

It is worthy of note that the initial level of serum potassium is not always low in patients with spontaneous extrasystoles and that the dose required to establish normal rhythm varies from patient to patient. There would seem to be four possible ways in which potassium might act in abolishing arrhythmia:

1. By the mechanism discovered by Ringer—that is, by depression of the conductivity and prolongation of the refractory period of heart muscle.

2. By replacement of the deficient potassium which has been postulated to be present in the heart muscle in some of these patients (Sampson and Anderson, 1930; Harrison, Pilcher, and Ewing, 1930).

3. By altering the hydrogen-ion concentration of the blood—an aspect of the problem which it is proposed to investigate.

4. By altering the ratio between the potassium and calcium or the potassium and sodium. This would seem to be supported by the facts that potassium chloride has been shown experimentally to produce cardiac irregularity (Wiggers, 1930; Report of Strangeway Laboratory, 1926) and that in three of Sampson and Anderson's cases a paradoxical effect was noticed after ingestion of potassium salts. In two of these there was an increase in the number of extrasystoles, and in one paroxysmal ventricular tachycardia was initiated. The oral administration of 4 grammes of potassium chloride three times a day increased the number of attacks of paroxysmal tachycardia in a patient of Dr. Paul Wood's (personal communication).

Summary and Conclusions

The administration of potassium salts caused the disappearance of extrasystoles in one case in which they were associated with insulin hypoglycaemia and in four in which they were spontaneous.

In three of these five cases the level of potassium in the serum was estimated and the disappearance of the extrasystoles was associated with a rise in potassium level.

Attempts to produce extrasystoles by the administration of ephedrine were not successful. In contrast with insulin and adrenaline, ephedrine does not produce consistently a fall in the serum potassium.

Potassium salts have been reported to produce cardiac irregularities in experimental animals and to increase the incidence of extrasystoles and paroxysmal tachycardia in some patients, so that their action in suppressing extrasystoles cannot be utilized with confidence in the treatment of patients until further work has clarified the mechanism of these effects.

My thanks are due to the Chief Medical Officer of the London County Council and to Mr. J. N. Deacon, medical superintendent of Redhill Hospital, for their consent to the publication of this paper.

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J. Mathieu (*Thèse de Paris*, 1940, No. 297), who records twenty-one cases in patients aged from 25 to 45, states that the pseudo-ulcerative form of duodenitis is assuming an increasing importance among duodenal affections. The condition is to be explained by inflammation in the ileo-caecal region, especially chronic appendicitis. Although the symptoms closely resemble those of duodenal ulcer, the correct diagnosis can be made by radiological examination. Treatment should start as soon as possible and should consist in removal of the chronically inflamed appendix and ileo-caecal adhesions. In cases where the symptoms persist, gastrectomy or duodeno-jejunostomy should be performed.

BROMIDE THERAPY AND INTOXICATION

BY

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In these days of "the war of nerves," especially in the present phase of nightly air raids, many people of "nervous" temperament suffer from an increase in their feelings of anxiety: moreover, exceptional nervous strain may produce symptoms of anxiety (such as irritability, tenseness, physical and mental restlessness, or insomnia) in individuals not constitutionally anxious. The most widely used drug in the treatment of such cases is one of the bromide salts, and there is no doubt that bromides when properly administered are extremely effective for those "nervous" cases in which anxiety in one or other of its forms is the outstanding feature, and especially so when there is reason to believe that *external* events (in contrast to intrapsychic conflicts) are causing it.

Finding the Optimum Dose

It is often not realized, however, that there are considerable variations in the dosage required to produce the greatest therapeutic effect, and that it is necessary, when once the optimum dose is discovered, to maintain it, usually for several weeks. It may be added that a gradual lowering of the dose at the end of treatment is sometimes better than a sudden cessation. Now this variability in the optimum dose depends on two factors: first, the rate of excretion of the drug: and, secondly, the personal factor whereby the optimum concentration of bromide in the blood can vary widely in different individuals. As an example of this second factor a blood bromide of 150 mg. per 100 c.cm. may be the optimum level in Patient A, while 50 mg. is best for Patient B. Moreover, Patient A might be completely unaffected if his blood bromide was kept at 50 mg., whereas Patient B if allowed to have 150 mg. per 100 c.cm. of bromide in his blood for many days might develop an acute toxic delirium. It is therefore useless, when giving bromides, to aim at reaching any definite level in the blood, and it is impossible to state what is a definite toxic threshold. On the whole, however, levels of under 100 mg. per 100 c.cm. may usually be considered safe, while in the range from 100 to 200 mg. toxic symptoms are likely to appear in certain subjects, and levels of over 200 mg. more often than not produce such symptoms. But the personal factor must never be forgotten since levels of over 350 mg. have been recorded without symptoms having been observed. In short, when considering bromides, "one man's meat is another man's poison."

The rate of excretion depends chiefly on the efficiency of the kidneys and the daily fluid and sodium chloride intake. It should be remembered that bromide acts by replacing the chlorides in the body, and the greater the consumption of salt in the diet the more rapid the excretion of bromide. Thus, if 50 grammes of bromide is given to a person who is on a low salt diet and has a small fluid intake the blood bromide at the end of twenty-four hours will be appreciably higher than when the same amount of bromide is given to someone having a greater salt-fluid intake. Patients with arteriosclerosis or cardiac or renal disease are slow excretors of bromide, and so are apt quickly to accumulate toxic concentrations of the drug, and, in general, elderly patients—with or without obvious arteriosclerosis—are liable to become intoxicated even with a low concentration.

Need for Careful Clinical Observation

The above considerations should make it clear that medication with bromides calls for careful clinical observation and control if real success is to be achieved. Doses must be large enough to be effective yet not so large as to intoxicate. It is not suggested that routine blood-bromide estimations should be made, though the test is extremely valuable in some cases—e.g., in giving guidance as to whether a swaying gait is due to an increase in hysterical symptoms or an early intoxication, and in such cases as are presently recorded. Above all, in our efforts to give bromides scientifically we must not forget that our patients are morbidly over-anxious and that they are asking for reassurance, though perhaps many of them are too anxious to ask out loud. In nine out of ten cases with prominent anxiety symptoms one or other of two recurring dreads is worrying the patient: it is either "Shall I lose my reason?" or "Shall I suddenly drop down dead?" Yet it is surprising how rarely a patient will dare to disclose either of them spontaneously. In short, the individual must be treated with psychological understanding, and when the symptoms have been clearly produced by environmental stress the advantages and disadvantages of sending the patient away for a time must be carefully considered.

When bromide treatment has been decided on, a useful initial dose is 10 grains of one or other of the salts thrice daily. On the other hand young adults showing acute symptoms of anxiety can be given double the above dose—i.e., 20 grains thrice daily. In either case the patient should be seen at the end of a week, as by that time there should already be some improvement if the dose is adequate. (Renewed psychological help will also be demanded by that time.) If there is no improvement the dose can be increased by about 50%, but not more than 90 grains daily should ever be given. On the whole those with intense symptoms need larger doses than mild cases, but the drug should always be prescribed with care for patients over 50. After two weeks mild symptoms of intoxication can begin, and should therefore be watched for. The common symptoms are complaints of tiredness, weakness, "dopeyness" or "drunkenness," inability to concentrate through mental sluggishness, failing memory, loss of appetite, and broken uneasy sleep. Some of these symptoms, of course, may have been complained of before the bromide treatment was started, but if the original symptoms of anxiety first recede and then some of the symptoms common to anxiety and intoxication develop a few weeks later, one's suspicions should be aroused.

Treatment of Bromide Intoxication

As the subject of bromide intoxication was ventilated rather freely a few years ago (Barbour, Pilkington, and Sargant, 1936), it is not proposed to dilate on the different mental and physical conditions that may be produced. It will suffice to say that the more severe intoxications are typical toxic-delirious states with confusion and visual hallucinations, while in the most severe cases coma is produced which in rare instances is fatal. It should be emphasized in passing that the presence of an acneiform skin eruption which the older textbooks used to delight in mentioning is the exception rather than the rule (Craven, 1933; Sharpe, 1934). The treatment of bromide intoxication when established or suspected is a simple procedure. The bromide is immediately stopped and large quantities of bland fluids are given. Sodium chloride is also given—30 grains four-hourly. As a precautionary measure while administering long courses of bromide the drug should be stopped for about ten days every few weeks: it is sometimes wise to give, in addition, a salt mixture during these "rest periods."

Bromide is of course one of the most widely used of all drugs, yet it is surprising how often patients with anxiety states are seen in consultation who have never had any, or at any rate not more than an odd bottle, which is practically useless. Nevertheless, in every few months of psychiatric practice a serious case of bromide intoxication crops up. The following two cases are reported, not to discourage the use of a valuable drug, but because they are of special interest. Case I was a patient practically moribund during the peak of her intoxication; it illustrates the danger to life from what is sometimes considered a harmless drug.

Case I

The patient, a woman aged 58, was first seen on December 19, 1939. Until two months previously she had always been healthy and had had no illness of any kind. She is a happily married woman, cheerful and well adjusted, and comes of a healthy family.

In October, 1939, she developed a right facial herpes zoster, the area supplied by the ophthalmic division of the fifth nerve being chiefly affected. The eruption became infected and she developed erysipelas. This quickly subsided, but she became drowsy and a diagnosis of meningitis was considered. She was then given a blood transfusion, but without noticeable improvement. For the next three weeks she became increasingly irritable, tearful, resentful, and paranoid. She then became semi-comatose and frequently screamed and moaned. When examined on December 19 in a general hospital she was extremely drowsy, but could be roused for short intervals. It was apparent that she was very confused and completely disoriented. The only constant feature of her confused state was an idea that the nurses were laughing at her. Physically her general condition was poor, and she looked very toxic and dehydrated. There was no rash. A diagnosis of a toxic-confusional state was made, and bromide intoxication was suspected because she had a tendency to herpes labialis, though her husband thought she had not been having any bromides. A sample of blood was then examined, and bromide content was found to be 300 mg. per 100 c.cm.

When next seen, on December 22, her general condition was much worse. There had been difficulty in giving her the large quantities of fluids ordered and she had consequently become even more toxic and dehydrated. Her temperature was 100° and she had a thready pulse, the rate being between 120 and 130. She was quite unconscious but very restless. She was moved to the Warwickshire and Coventry Mental Hospital the same afternoon and rectal salines were started immediately. She became so restless that repeated small injections of morphine (combined with coramine) were given during the first twenty-four hours. The main eliminative treatment was with large quantities of bland fluids, and during the three and a half days immediately following her transfer she received at least 584 oz.—an average of 167 oz. (i.e., more than 8 pints) a day. She at once began to improve, and by December 27 was conscious enough to be able to describe visual hallucinations, the occurrence of which is so common in toxic mental states. On December 29 her blood bromide was down to 250 mg., and by January 3, 1940, to 175 mg., per 100 c.cm. By the beginning of January she was able to walk a few steps unaided, and, apart from an anaesthetic right cornea and diminished appreciation to pin-pricks in the 5^1 and 5^2 areas, there were no physical signs. She was almost clear mentally and had good insight. Her blood bromide when last examined on January 23 was 125 mg. Other tests done at this time included urea clearance, which gave 70% of normal function; C.S.F. examination, which was normal in all respects (bromide 125 mg.); and the Wassermann, which was negative.

By the time she was discharged on January 31 she had completely recovered physically and mentally, and has remained well since except for occasional pain around the right eye.

Case II is of interest because it was produced accidentally by me while the patient was in hospital, in spite of precautions against intoxication having been taken; it illustrates the degree of vigilance necessary. The chief clinical interest of the case, however, was the greatly disordered carbohydrate metabolism which was temporarily produced by the toxaemia and which at first confused the diagnosis. Eric Holmes (1939) in a critical survey of the literature of abnormal carbohydrate metabolism states that it is well known that toxaemia produced by bacteria, and also by substances such as chloroform and phosphorus can have drastic effects on carbohydrate metabolism, and Elkeles and Heimann (1927, 1928) found that 40 grammes of fructose given to diphtheritic patients sometimes caused hyperglycaemia and glycosuria. Such abnormality of metabolism occurring as the result of bromide toxaemia has not been previously reported so far as I know, though Dr. R. D. Lawrence informs me that he has seen almost the same with morphine poisoning.

Case II

A 64-year-old widow was admitted to hospital in April, 1939, in a depressed and agitated condition. She also expressed some depressive delusions; but there were no hallucinations, nor was there any evidence of intellectual deterioration. Physically she was in good health and there were no signs of disease. The blood pressure was within normal limits and no arteriosclerosis was found. Urine was normal and contained no sugar; the Wassermann reaction was negative and the blood count normal. Previously she had been a cheerful and capable woman and had always been healthy. She had been a hotel manageress, and when she retired in 1937 she at once regretted it. By the end of that year she had become agitated and depressed, in which state she remained without important change till her admission to hospital.

A few weeks' treatment, however, resulted in considerable improvement, and soon she started to lead an active life in hospital. Nevertheless on September 6, 1939, as she was still over-anxious, she was given a bromide mixture (ammonium bromide, 10 grains thrice daily), which was continued until October 18. A slight sedative effect was obtained, but there were no signs of intoxication. The mixture was then withheld for ten days purely as a precautionary measure, it being my practice to do this when giving bromide to elderly patients who might perhaps easily become intoxicated. The same mixture was started again on October 28, and was continued till November 24, when it was again stopped, this time for six days, as a precautionary measure. Again only a slight sedative effect had been produced. During the last week of November, however, she became agitated almost at once, so on November 30 the bromide mixture was given once more. As there was no improvement she was put to bed on December 8, and 10 grains of medinal and 5 units of insulin were ordered twice daily to produce a drowsy, restful condition. After only one dose, however, she was noticed to be perspiring freely and the nurse reported that she did not seem "very well." The case proceeded as follows:

December 9.—Slightly drowsy. Condition satisfactory. Medinal and insulin continued.

December 10.—Very drowsy, so the medinal and insulin were given once only.

December 11.—Still very drowsy, but both doses of medinal and insulin were given. Had to be helped with feeding.

December 12.—Still very drowsy. Fed by nurse. All drugs were stopped. (In addition to the medinal, insulin, and bromide she had been having thyroid for arthritis associated with obesity. She began with 1/2 grain of thyroid in September, the dose being gradually increased till in November she was having 1 grain thrice daily.)

December 13.—The patient was comatose, though her general condition was fairly good. Physical examination did not reveal any abnormal signs in the C.N.S. or other systems, but a most puzzling finding was the presence of glycosuria and a blood sugar of 230 mg. per 100 c.cm., which later in the day rose to 400 mg. The absence of acetone in the urine excluded diabetic coma. No diagnosis was made this day, though an acute cerebral condition—most probably a cerebral

haemorrhage—was considered a possibility. That the coma was due to an idiosyncrasy to barbiturates was ruled out because several months previously she had had the same doses of medinal and insulin daily for two weeks without any ill effects. Bromide intoxication was not seriously considered because of the precautions which had been taken to prevent it and because the development of coma from mere drowsiness had been more rapid than usually occurs in a bromide coma. Treatment consisted in giving plenty of glucose in orange juice and 10 oz. of rectal saline, while later in the day, when the high blood-sugar level was known, treatment with insulin and glucose was started. The blood urea was 50 mg. per 100 c.cm. Full details of urine and blood-sugar examinations, insulin dosage, etc., for December 13–16 are shown in the Table.

Table showing Details of Urine, Blood Sugar, Insulin, etc., during December 13–16, 1939

Date	Urine	Blood Sugar per 100 c.cm.	Insulin Given	Glucose Given
Dec. 13 ..	Sugar ++ (a.m.), s.g. 1022, sugar + + + (p.m.)	2.30 p.m., 230 mg. 5.30 p.m., 400 mg. 11 p.m., 340 mg.	7 p.m., 20 units During night, 80 units	Considerably more than 8 oz. of pure glucose
Dec. 14 ..	S.g. 1042, Sugar + + +, Alb. +, Acetone, nil	10 a.m., 160 mg. 4.15 p.m., 290 mg. 8 p.m., 150 mg. 10.30 p.m., 110 mg.	During day, 60 units During night, 10 units	Not noted, but not a great deal
Dec. 15 ..	Sugar, trace Alb., trace Acetone, nil	10.15 a.m., 150 mg. 5 p.m., 170 mg.	During day, 40 units During night, 20 units	No record
Dec. 16 ..	Sugar, trace Alb., trace Acetone, nil	10.30 a.m., 130 mg.	None	

December 14.—During the night of December 13 the coma deepened very much, and by the next morning she was extremely ill; the pulse ranged from 104 to 120 and the temperature averaged 100°. The blood bromide was estimated early in the morning and was found to be above 400 mg. per 100 c.cm.—an exceedingly high figure—and this knowledge made the unexpected diagnosis of bromide intoxication quite certain. Detoxication was at once started. During the day were given 2 pints of intravenous saline, 4 pints of bland fluids containing a fair amount of glucose by nasal tube, an intravenous injection of mersalyl (as no

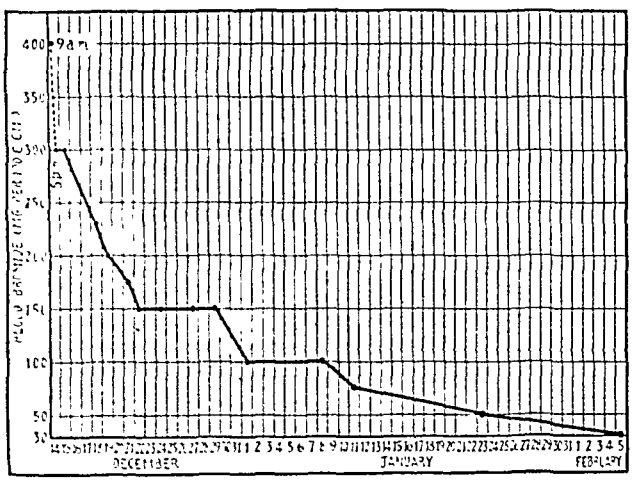


Chart showing the fall in blood-bromide levels from December 14, 1939.

urine had been passed for nine hours), and 30 grains of sodium chloride every four hours. Three injections of nicamide were also given and 70 units of insulin in the twenty-four hours. The second intravenous saline had a dramatic effect, as there were for the first time signs of the coma lessening immediately after it had been given. This energetic treatment lowered the blood bromide to 300 mg. by 5 p.m.

December 15.—She was definitely better and the coma was lighter. The pulse was slower (average 102) and she managed to swallow some fluids unaided. Altogether 6 pints of fluids were given.

December 16.—Further improvement. Temperature normal; pulse 90. Able to swallow quite well. Conscious but confused. From this date progress was rapid, and by January 1, 1940, she was in just the same physical and mental state as before December 8. The accompanying chart shows the fall in blood-bromide levels. A blood-sugar curve and a urea-clearance test done some months later gave normal results.

Summary

The commonest indication for bromide therapy is given, and problems regarding dosage are discussed.

The importance of concurrent psychological help is stressed.

Notes on bromide intoxication and its treatment are given, and a case of almost fatal intoxication is reported.

Another case of severe intoxication is described in which hyperglycaemia and glycosuria were produced.

I wish to record my thanks to Dr. R. D. Lawrence for his helpful criticism and to Dr. D. N. Parfitt, medical superintendent of the Warwick County Mental Hospital, for permission to publish the two cases.

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A CONTRIBUTION TO THE STUDY OF HUMAN FERTILITY

BY

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Divergent opinions are expressed regarding the possible existence within the human intermenstrual cycle of a limited period of fertility. The affirmative views of Knaus and of Ogino are well known. Contrary views—for example, those of Weinstock (1934)—should also be noted. The problem is largely one of collecting reliable statistics, and it is evident that the keeping of day-to-day records by competent observers would materially clarify the position. As a contribution towards this aim I give data abstracted from complete records of sexual activity kept by two pairs of young married partners (all in the early twenties). They fulfilled the necessary experimental conditions of desiring parenthood to follow marriage after an interval of one year or, preferably, two or more years, and, furthermore, were prepared to rely upon a "safe period" procedure, in accord with the views of Knaus, as the primary means of controlling conception.

In both cases the records were kept by the husbands, who noted the date of the start of successive menstrual flows and the date and nature of all acts of intercourse. In both cases positive contraceptive measures were exclusively employed only during the six-day "fertile" period of Knaus—that is, from the tenth to the fifteenth day inclusive following the onset of the preceding menstrual flow. At other times contraceptive measures were largely or entirely dispensed with. As a result in Case A 126 totally uncontracepted acts, distributed throughout the "safe" periods of thirty-three consecutive monthly cycles, preceded the impregnating coitus, and in Case B

450 such uncontracepted acts were similarly distributed throughout sixty-one consecutive monthly cycles. In addition to these, in Case A two further uncontracepted acts just trespassed within the "fertile" period (fourteenth and fifteenth days), and in Case B there was one such further act (fifteenth day). In both cases, when the positive contraceptive measures previously employed during the "fertile" periods were discontinued the desired pregnancies were achieved and followed immediately upon the first uncontracepted acts occurring within the tenth to thirteenth day of the intermenstrual cycles. The figures for uncontracepted acts are alone relevant for our consideration, and Table I records the day-to-day distribution of such acts throughout the thirty-four monthly cycles of Case A and the sixty-two cycles of Case B, the last cycle preceding the establishment of pregnancy being recorded separately from the totals of the preceding non-fertile cycles.

TABLE I.—*Distribution of Acts of Uncontracepted Intercourse*

Days of Cycle	Case A		Case B	
	Non-fertile Cycles 1-33	Fertile Cycle 34	Non-fertile Cycles 1-61	Fertile Cycle 62
1	0	0	6	0
2	1	0	0	0
3	0	0	0	0
4	2	0	1	0
5	3	0	2	0
6	6	0	2	0
7	3	0	2	0
8	2	0	0	0
9	1	0	1	1
Fertile period :				
10	0	0	0	1
11	0	2	0	1
12	0	3	0	1
13	0	2	0	0
14	1	2	0	0
15	1	2	1	1
16	5	0	3	0
17	3	0	5	1
18	3	0	7	0
19	5	0	20	2
20	4	0	26	0
21	4	0	30	1
22	10	0	36	0
23	9	0	47	1
24	8	0	41	1
25	9	0	42	0
26	11	0	42	2
27	6	0	37	0
28	7	0	34	0
29	9	0	27	1
30	10	0	16	0
31	2	0	7	1
32	1	0	7	0
33	0	0	3	1
34	0	Pregnancy	3	Pregnancy
35	0		3	
36	0		3	
37	0		2	
38	0		1	
39	1		0	
40	1		0	
Totals ..	128		451	

It should be added that both women were reasonably "regular," but there were some few occasions when menstruation was delayed. The duration of all the intermenstrual cycles over which the data extend is given in Table II.

TABLE II.—*Duration of Intermenstrual Cycles*

Duration in Days	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	Total
No. of cycles, Case A	0	0	3	7	4	5	8	2	2	0	0	1	0	0	0	0	1	33
No. of cycles, Case B	1	2	4	11	9	15	10	2	2	0	1	1	2	0	0	1	0	61

In Case A the war provided an interesting control in that when pregnancy was desired a short period of leave from service coincided with five of the six "fertile" days and there was naturally considerable sexual activity during this short period. No further cohabitation took place during the remainder of this last cycle in the record. Other points of interest are these. In Case A eighteen uncontracepted acts, and in Case B eight such acts, preceded the tenth day in different cycles (and therefore preceded ovulation) yet did not produce pregnancy. In Case A single acts on the ninth, fourteenth, and fifteenth days and in Case B on the ninth and fifteenth days of different cycles did not produce pregnancy. Further data which I have accumulated lead me to support the view that the type of fertility response shown by the cases described is probably widespread. The present data are published with no controversial aim, but rather with the hope that further day-to-day notes of sexual activity be kept and put on record in cases in which circumstances approximate to those here described. It is necessary to emphasize the importance of day-to-day records. Memory seems to be more than usually fallible in this sphere of human activity.

Summary

Data are given from two cases in which the dates of menstruation and of all acts of intercourse were recorded throughout periods of two and three-quarter and five years respectively. In the former case a total of 126 and in the latter case a total of 450 uncontracepted acts were distributed throughout thirty-three and sixty-one consecutive intermenstrual cycles respectively, at such times that no one of these acts fell within the tenth to the thirteenth day of the cycles. No pregnancy resulted. On the other hand, when pregnancy was desired, it was immediately achieved in both cases following the first uncontracepted acts falling within the tenth to the thirteenth day of the thirty-fourth and sixty-second cycles respectively. These results point to the existence, in the cases described, of a limited period of fertility within the intermenstrual cycle, and afford support for the view that such behaviour may be of more general occurrence.

Finally I should like to add an expression of deep appreciation and thanks for the care and understanding which my young friends gave to the collection of the data.

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Clinical Memoranda

Transplacental Tuberculous Infection

The following case may be considered of sufficient interest to merit publication.

CASE HISTORY

A married woman, aged 26, eight months pregnant, was admitted to hospital on April 21, 1939, with a history of headache and vomiting for three days. On admission she was semiconscious and showed clinical evidence of meningitis. Four hours after admission she was delivered of a living female child 5¼ lb. in weight. Lumbar puncture before delivery showed a cloudy cerebrospinal fluid under pressure. Analysis confirmed an increase in lymphocytes and polymorphs, with a decrease in the chloride to 0.62%. A few tubercle bacilli were seen. The mother died on April 24, three days after delivery, without having regained consciousness.

The child, on clinical examination apparently normal for a pregnancy of eight months' duration, gained weight steadily for three months. The feeds, which consisted of secway for the first few days, followed by Cow and Gate half-cream, were well tolerated from the start. At three months enlargement of axillary and inguinal glands was noted, the glands being firm and discrete, with no tendency to break down. The temperature was intermittent in type and the child began to lose weight rapidly. At the same time it developed a cough, but there were no definite clinical findings in the chest. Radiographic examination revealed miliary tuberculosis of

both lungs. Later the liver and spleen became moderately enlarged. The child's condition deteriorated rapidly and it died on August 13, three weeks after the onset of symptoms.

POST-MORTEM FINDINGS

There was extreme emaciation. The heart and pericardium were normal, but both lungs were studded with miliary tubercles, which had coalesced into caseous areas. Large caseating glands were present in the mediastinum. The liver and spleen showed extensive caseous areas, and the kidneys had scattered tubercles in the cortex, with one or two immediately deep to the capsule. The mesenteric glands were large and caseating, and several extensive tuberculous areas were observed in the pancreas. The peritoneum appeared to be quite free from infection.

The child had no contact with the mother after delivery, and owing to domestic circumstances remained in hospital from birth. Members of the families of both parents were interrogated, and so far as could be ascertained there had been no history of tuberculosis in the past on either side. It has since been found that the house in which the woman had been living for the last twelve months of her life had been occupied immediately before by a now known open case of pulmonary tuberculosis.

Unfortunately pathological and bacteriological examination of the placenta was not carried out. Close investigation failed to establish any definite source of infection, and it appears reasonable to suppose that in this case infection was conveyed to the foetus through the placenta.

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Acute Malignant Tertian Malaria: Treatment Aided by Reconstituted Serum

Since in several dockside hospitals in the British Isles there have recently been a number of deaths from acute malignant tertian malaria acquired abroad, it is thought that a note on the treatment of one such case might be of interest.

CASE REPORT

An Indian seaman aged 35 was brought into hospital on a stretcher at 2 p.m. on August 18 and was admitted immediately. Owing to the restriction of shipping through the Suez Canal his ship sailed from India via the Cape. She had left Calcutta two months previously, calling at Capetown, and then Freetown, where she lay at anchor for two weeks before proceeding to England. At Freetown no mosquito nets were provided, and soon after leaving the port most of the crew suffered from fever and rigors. The patient had felt strong and well before this trip. Soon after the onset of fever he received on board "some pills and a watery mixture."

On examination he looked very ill; he was rather emaciated, was drowsy, and appeared to be jaundiced. The tongue and mouth were extremely dry and he was very thirsty. The spleen and liver were palpable; the urine was dark, bile-stained, and scanty. He felt very weak and had vomited several times during the preceding few days. The temperature was 102° F., pulse 120, and respirations 28. A blood count showed: red cells, 2,750,000 per c.mm.; white cells, 6,500 per c.mm.; haemoglobin 50%. Many malignant tertian ring forms were detected in every microscopical field. Gametocytes were not seen. The red cells showed secondary anaemia changes, achromia, punctate basophilia, and anisocytosis; some revealed the so-called "brassy" staining of malignant tertian malaria. The case proceeded as follows:

August 18.—At 5 p.m. 9 grains of quinine dihydrochloride was given intramuscularly, and tab. atebrin 1 grain t.i.d., alkaline mist. plus glucose by mouth to excess. At 6 p.m. the patient had a rigor. The temperature was 104°–105°, pulse 128, and respirations 28.

August 19.—At 2.30 p.m. there was no improvement in the patient's condition. He was still very drowsy. The temperature had fallen to subnormal at 10 a.m., but was now 99°. He passed some urine, the reaction being faintly alkaline. Blood smears still showed as many malignant tertian rings as on the previous day. His general condition was causing considerable anxiety. At 2.45 p.m. 7 grains of quinine was injected intravenously, followed by 10 minims of adrenaline subcutaneously. At 3 p.m. 400 c.cm. of reconstituted serum was administered intravenously by the drip method, 40 to 60 drops per minute. The patient's condition at 5.15 p.m. was much improved; his drowsiness had almost gone, he looked quite different, and he smiled and talked intelligently. Fluids were still forced.

August 20.—His condition was very much improved. The temperature rose to 101° F. at 6 a.m., then fell to 99.4° at 10 a.m. and 99° at 2 p.m. and 6 p.m., but increased to 101° again at 10 p.m. No rigors were observed, the patient ate well, and no parasites were seen in blood smears.

August 21.—The patient was getting along nicely. Temperature and urine were normal and he was taking a normal diet. Parasites were not seen in blood smears. He now made what appeared to be an uninterrupted recovery.

COMMENTARY

Until 2.30 p.m. on August 19 the patient had been gravely ill and appeared to be sinking. At this point intravenous quinine followed by reconstituted blood serum was suggested by one of us (A. H. W.), and permission was sought from Dr. P. H. Manson-Bahr to follow this course; he immediately agreed. The improvement in the man's condition after starting this treatment was striking. It is suggested that the action of the reconstituted serum is twofold: it tends to dilute and perhaps to some degree neutralize the circulating malaria toxin, and also to minimize quinine shock, sometimes sustained by toxically debilitated patients of this type.

Our thanks are due to Dr. P. H. Manson-Bahr for permission to try out this treatment and to publish this note.

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House-physician.
A. H. WALTERS,
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Pentothal Sodium in Tetanus

Pentothal sodium is of little value in the routine treatment of tetanus owing to its transient effect. In a severe case the actual administration would be difficult, and there may be a considerable local reaction if the drug is accidentally injected outside the vein; while marked trismus might lead to difficulty in maintaining a free airway if the dose given were insufficient to relax the jaw. The drug does, however, seem to have a certain use in such a situation as that here described.

CASE REPORT

A man aged 26 was found to have well-marked tetanic paroxysms eight days after the amputation of two fingers of the right hand which had been crushed by an overturning plough, although he had had 1,000 units of A.T.S. at the time of operation. There was, however, no trismus.

It was decided to give an intravenous injection of pentothal sodium to control the paroxysms during the journey to hospital by ambulance. Ten c.cm. of a 1 in 15 solution (0.66 gramme) was injected into a vein of the left forearm, well clear of the antecubital fossa. A generalized spasm was induced by the prick of the needle, but the arm was easily controlled by an assistant, and induction was otherwise smooth. An airway was inserted, and the journey of about fifteen minutes was completed without incident, the patient remaining relaxed and unconscious and breathing quietly. Shortly before arrival the airway was removed, as masseteric tone was returning and the gagging which often follows closely on this sign might have induced another paroxysm. The patient subsequently recovered from his tetanus after treatment on the usual lines.

Winchester. H. NOEL DAVIS, B.M., B.Ch.

J. Habas (*Thèse de Paris*, 1940, No. 306), who records seven cases in women aged from 23 to 51, states that lactation should not be regarded as the only cause of mastitis, though it presents the most favourable conditions for its development. Mastitis may develop in the course of certain infections such as typhoid fever, in which abscesses with a pure culture of *B. typhosus* are found, and in mumps.

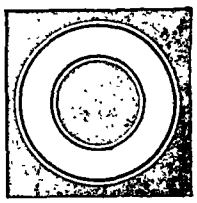
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Reviews

PSYCHIATRIC CLINICS

Psychiatric Clinics for Children: With Special Reference to State Programs. By Helen Leland Witmer, Ph.D. (Pp. 437. $2.50, or 14s. net.) New York: The Commonwealth Fund; London: Oxford University Press. 1940.

When after the war the social services come to be reconstructed and, it is to be hoped, extended, the "mental side of medicine" will have to be considered equally with the physical side, which has heretofore occupied such a disproportionate amount of attention. Guidance will be required for those concerned both directly as executive officers of the public health and indirectly as the intelligent lay public, whose approval is necessary, in a democratic State, to make any official enterprise a success. Dr. Witmer's book should therefore command a wide circle of readers, for in it she has lucidly surveyed thirty years of experiment in the mental field of medicine in America, where enterprise and resources have both so much exceeded our own.

The author starts with a historical survey of the influences which led to interest in the study of the psychiatry and psychology of childhood. There have been three avenues of approach. The first, the "organic" approach, is based on the theory that structural defects are to be looked upon as the main cause of mental deviation in children. Workers who deal with the subject from this angle will devote attention to the feeble-minded and those with neurological manifestations, and their chief object will be diagnosis and the proper distribution of such children in institutions or in "care," either in their own homes or in foster-homes, with little attention to treatment, since the condition cannot be cured. The second avenue of approach is based on analytic theories, the protagonists of which hoped that by early treatment an appreciable number of people would be kept out of mental hospitals and prisons. Experience has shown, however, that, even in the case of the functional psychoses and delinquency, pathogenic influences are not simple, that it is not easy to pick out those children who are certain or even likely to become psychotic or criminal, and that the attempt to do so is often attended by most unfortunate social consequences. The third means of approach is that of Adolf Meyer (rightly hailed by the author as the father of modern child guidance), whose main object is to afford treatment to those children who seem to require psychiatric help irrespective of ulterior motives for the future.

The second part of the book consists of a survey of the activities and difficulties of a large number of State-aided clinics throughout the Union. Owing to their declared objects, which often have not been fulfilled because of the varied standard of training and personal qualities of the staff, confusion and difficulties have arisen; these are reviewed.

Finally, the three objects of children's clinics as outlined above are discussed in more detail, and the conclusion is reached that the third approach is much the safest. There are undoubtedly very many children, whether supernormal, average, or subnormal in intelligence, who require psychiatric help in their adjustment to life. Such help must be given to the best of professional skill and ability; and if in the process better distribution is achieved of those who require "care," whether in or out of institutions, or if some who would otherwise have become psychotic or criminal do not do so, so much the better, but a start must not be made with claims which are based on ignorance and are therefore unlikely to be justified. In the last chapter is discussed the important subject of State-aided clinics for small and scattered communities. *Altogether this is a most important and useful book.*

VENEREAL DISEASES

Venereal Diseases. By E. T. Burke, D.S.O., M.B., Ch.B.Glasg. (Pp. 550; 133 illustrations and 6 colour plates. 30s. net.) London: H. K. Lewis and Co., Ltd. 1940.

There can be few venereologists who have a wider experience of the subject or who have given more time and thought to it than Colonel Burke, so that his book is sure of a wide circulation, and justly so. It can be said at the outset that as a guide to diagnosis it could hardly be bettered; the clinical pictures are well drawn and the colour plates and photographs are unsurpassed. On the other hand, some of the theories—such as the calculation of the amount of treatment for early syphilis, the therapeutics of bismuth, and the pathology of gonorrhoea—will hardly commend themselves to the average venereologist: a theory, after all, is only a theory till it has been proved, and the propounding of it does not establish it as a fact. In short, this book consists of matter of which 70% is thoroughly sound and 30% highly controversial, not to say heretical. As regards the former, in few books could a reader find so much valuable information put so clearly and succinctly: the clinical acumen of the author perhaps finds expression best in the statement (p. 102), "Over-treatment [of early syphilis] need not be harmful; under-treatment is bound to be disastrous." The latter cannot be discussed in detail within the limits of a short review. Suffice it to say that Colonel Burke has long ploughed a lone furrow in his evaluation of anti-syphilitic therapy and has not yet succeeded in converting any large body of venereologists.

The section on gonorrhoea is altogether admirable, but the reader will do well to ponder over what is said about the bacteriology of that disease and to accept with considerable reserve some of the views put forward.

This volume is well produced and is remarkably free from typographical errors. As constructive criticism it is suggested that rather more might have been said about post-arsphenamine jaundice and that some colour plates showing urethroscopic appearances in chronic urethritis would be a great help to those who have small experience in the use of the urethroscope. The book is hardly one for the unqualified student, as examiners might not approve of some of the views expressed; but there are few venereologists who will not learn something from it, and there is much in it to give them food for thought.

ATLAS OF SKIN DISEASES

An Atlas of the Commoner Skin Diseases. By Henry C. G. Semon, M.A., D.M., F.R.C.P. With 120 plates reproduced by direct colour photography from the living subject, under the direction of Arnold Moritz, B.A., M.B., B.C. Cantab. Second edition. (Pp. 272. 42s. net.) Bristol: John Wright and Sons; London: Simpkin Marshall. 1940.

This atlas, one of the best dermatological atlases yet produced, has deservedly attained a second edition. Seventeen plates, fully up to the standard set by the authors, have been added. Although primarily devoted to the commoner skin diseases—and this is what makes the book so useful—there is an interesting appendix of examples of less common diseases. As evidence of the efforts made by the authors to give the fullest help to the practitioner we may mention that no fewer than twenty-one plates are illustrations of various forms of dermatitis. Not only have new plates been added but

the text, which was always instructive and full of sound suggestions, has been revised and in a few instances corrected. As we noted on the appearance of the original work, colour photography is often a snare and a delusion, and frequently provides pictures that are less recognizable than are monochrome illustrations; but in the present case the authors have given us something that defies criticism. A striking testimony to their excellence is the fact that eight of the plates have been included in the recent new edition of the great French work *La Pratique Dermatologique*. We congratulate the authors on their second edition, but condole with them on the fact that it has had to appear under the shadow of war, which provides an atmosphere by no means conducive to the contemplation of pictorial art. Nevertheless, practitioners will find the atlas very useful and dermatologists will enjoy it.

NUTRITION

The Fundamentals of Nutrition. By Estelle E. Hawley, Ph.D., and Esther E. Maurer-Mast, M.D. Including Table of 100-Calorie Portions, by Estelle E. Hawley, Esther E. Maurer, and Herbert F. Van Epps, and Discussions on the Dietary Management in Specific Conditions. With a foreword by John R. Murlin, Ph.D., Sc.D. (Pp. 477; illustrated. $5.00 post paid, or 27s. 6d.) Baltimore: Charles C. Thomas; London: Baillière, Tindall and Cox. 1940.

The contents of this book fall naturally into four sections. The first deals with the basic facts of the physiology of nutrition, and in the short space of fifty-six pages an excellent review of the problem is given. The second section deals with dietotherapy in disease and in special conditions such as pregnancy, growth, etc. Discussions of the dietary management in specific conditions are contributed by some twenty specialists associated with the School of Medicine and Dentistry in the University of Rochester. The general standard is high, and the modifications of the diets advised are based on sound physiological principles, the influence of faddism or fashion being noticeably absent.

The translation of these scientific principles into practical dietetics for the general practitioner and the housewife is based on a knowledge of tables of foods arranged in 100-calorie portions. These tables occupy thirty-three pages of the book. A great mass of information about the contents of every kind of food is available; this will be most valuable to the professional dietitian. For the general practitioner, however, diet sheets with daily menus and adequate food exchanges appear to the reviewer to be a simpler method of translating scientific principles into practice. Much useful information will also be found in regard to such problems as the planning of diets, the evaluation of nutritional states, the cost, potency, and dosage of commercial vitamin products, the preparation of food for allergic patients, etc.

The book can be recommended with confidence to those who already have some knowledge of the physiology of nutrition and to beginners who wish to make a serious study of the subject.

LAW FOR NURSES

Law for Nurses and Nurse Administrators. By S. R. Speller, LL.B., Barrister-at-Law. (Pp. 206. 10s. 6d.) London: H. K. Lewis. 1940.

The nurse, especially when she becomes senior in her profession, needs to know a surprisingly large amount of law. A matron must have at least a working knowledge of the law of master and servant, sale of goods, defamation, the liability of a hospital for its staff, the law relating to poisonous and dangerous drugs, and a dozen other subjects. The profession badly needed a book on law, and no better author could have appeared than Mr. S. R. Speller. In addition to his legal qualifications he is in close touch with the practical problems of nurses and hospital managers as secretary of the Incorporated Association of Hospital Officers and editor of *The Hospital*. He explains in his preface that his chief difficulty was to know where to set bounds to the work. Certainly within a moderate compass he has covered a very wide range. He gives an outline of English law—always a useful beginning to a book on law for lay persons—and he then sets out the legal basis of the status of a registered nurse and a certified midwife. Other chapters deal with the various contractual relations of a nurse and the difficulties of the master and servant relationship between a nurse and a hospital committee. Termination of service, dismissal without notice, testimonials, and references are discussed in this section. Other practical problems arising out of the loss of a patient's property, the detention of a patient against his will, breach of confidence, mental defectives, insurance, evidence, cheques, wills, and many other legal incidents are concisely treated. It is refreshing to see the very detailed table of contents, which makes any required part of the book easy to find; also the precise documentation of every controversial proposition and the complete references to tables of cases and statutes. Perhaps the author has devoted too much space to setting out the general law. For instance, it is a little difficult to see quite why a nurse—unless she has to answer questions in an examination—needs a list of the contracts which are only valid if set out in a deed, or of those which must be in writing. It might have been better also to confine discussion of the law of sale of goods to the immediate requirements of nurse administrators. Similarly, much of the Public Health Act and Factories Act seems a little outside the ordinary experience of nurses. These, however, are minor details, and the book should be invaluable not only to the nursing profession but also to hospital managers, owners of nursing homes, and persons whose business takes them into contact with nursing. A useful feature is the classified bibliography at the end.

Notes on Books

Dr. R. W. LAWRENCE'S well-known and useful book *The Diabetic Life* (J. and A. Churchill, 9s. 6d.) has now reached a twelfth edition, to which has been added a loose page on "Wartime Precautions for Diabetics." In his preface the author refers to inquiries he has received about food in wartime, and points out that butter and vitaminized margarine are of equal value in the treatment of diabetes. Fresh cream will be missed by many diabetics, but a satisfactory substitute can be made from milk and butter or margarine emulsified in one of the cheap apparatuses now on the market. It is also pointed out that by giving up the sugar ration diabetics receive one extra meat ration and two extra fat rations a week, for which a doctor's certificate is required by the Food Office. Dr. Lawrence well fulfils the object he set himself in the first edition of his book—namely, "to bring the modern treatment of diabetes by diet and insulin within the scope of the general practitioner and the understanding of the patient, whose intelligent co-operation is necessary for the best results."

A fourth edition of *Psychology and Psychotherapy* reminds us again of Dr. WILLIAM BROWN'S extensive culture and wide erudition, but there is still the old complaint of a lack of that cohesion in his system of psychology which we should like to see. He has added chapters on the psychology of later life and on sublimation, both of which are essays only indirectly connected with the rest of the book. Those who read this book for the first time will find much to stimulate thought, and those who already know the author's work will have

pleasure in reminding themselves of the many problems which he has opened up, even though he may not have solved them satisfactorily. The publishers are Edward Arnold and Co., and the price is 12s. 6d. net.

The appearance of a fifth edition of Conybeare's *Textbook of Medicine* (E. and S. Livingstone, 24s. net) shows that it has become firmly established in the affections of those who need a handy compendium of medical knowledge either for passing examinations or for keeping abreast of the times. In the preface the editor points out that his task has been made difficult by the dispersal of his contributors in the Services or in the Emergency Medical Service. The section on cardio-vascular diseases has been thoroughly revised by the editor in conjunction with Dr. Maurice Campbell. Dr. Maurice Mitman has co-operated with Dr. Harries in the revision of the section on infectious diseases. Fresh knowledge of the use of the sulphonamide group of drugs has been incorporated in those parts of the book which deal with the treatment of infections with micro-organisms susceptible to these compounds. Other innovations include an article on congenital cystic disease of the lung, on herniation of the nucleus pulposus, and new radiographs. Revision has in fact brought this well-known textbook up to date.

That a second edition of Mr. EUGENE WOLFF'S *Anatomy of the Eye and Orbit* (H. K. Lewis, 31s. 6d.) should be called for after seven years is evidence of the usefulness of this volume, which is wider in scope than the well-known treatise of Whitnall on the anatomy of the orbit. The book is a clear and profusely illustrated exposition of the more elementary aspects of ocular anatomy. Avoiding the minutiae of the subject, the author includes little that is controversial, though he imparts some individuality by drawing rather freely on his own material. The present edition is richer by some sixty illustrations than the previous edition, and contains a series of drawings of flat sections of the retina. The chapters on the embryology and the comparative anatomy of the eye add to the interest of the work. Much care has obviously been given to the production of this volume, but some of the references are incomplete.

Preparations and Appliances

CUT-OUTS FOR TO-AND-FRO ABSORBERS

Dr. F. BARNETT MALLINSON, honorary anaesthetist, Princess Beatrice, Royal Waterloo, and Woolwich Memorial Hospitals, anaesthetist to E.M.S., writes:

Since I described the absorber cut-out in the *Journal* for May 11, 1940 (p. 774), an improved model has been designed which, while embodying exactly the same principle as the last, has several more convenient features. A photograph of the apparatus is reproduced herewith (Fig. 1) along with diagrams depicting end and side views (Figs. 2 and 3).

The circulation of the gases is as before—passing direct from the face-piece into the canister, thence via the external pipe (P) across into the bag via a separate channel through the cut-out body, and then back again (following the same route reversed) in inspiration. A neater form of control (C) is incorporated, marked "Bag," "S/L," and "Off." The last-named is a new feature which cuts off the bag and allows the patient at the same time to breathe direct to the outside atmosphere; the purpose of this is to conserve the contents of the bag when removing the face-piece for intubation, etc. The port communicating with the air ensures that during the interval between cutting out the bag and unharnessing the face-piece the patient will still have unobstructed respiration.

As in the earlier model, the control will divert any desired proportion of the gases through the canister, but is more accurate and is easier to adjust. There is now no bayonet catch on the barrel of the control, the cut-out being a simple push-fit into the canister. A Waters canister is now generally used, and thus the owner's canister will fit without the need for a bayonet groove. The bag has been mounted in a more convenient position, and has a movable joint, thus ensuring a free and unimpeded situation for the bag, whatever the position of the cut-out or the patient.

If the patient is positioned well down the table so as to leave plenty of room on the head-piece, and his head is placed slightly to one side, it will be found that the face-piece can be applied quite comfortably, and the canister and cut-out will rest easily on the pillow with a little adjustment:

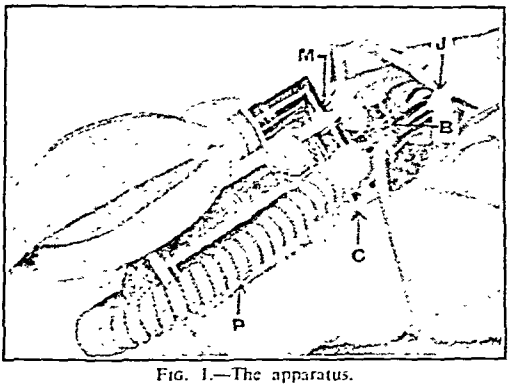


FIG. 1.—The apparatus.

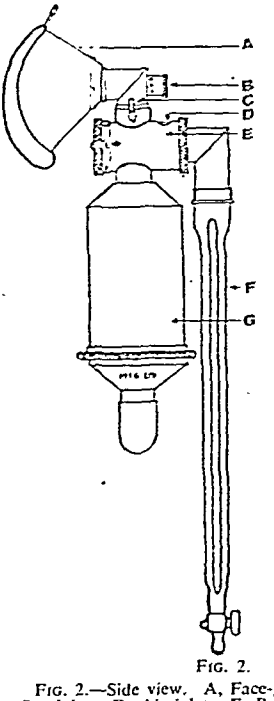


FIG. 2.

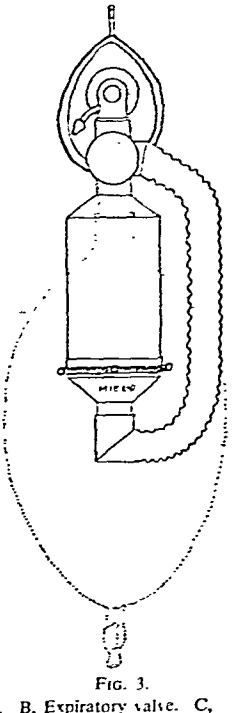


FIG. 3.

FIG. 2.—Side view. A, Face-piece. B, Expiratory valve. C, Gas inlet. D, Air inlet. E, By-pass stopcock with three positions: (1) to-and-fro breathing into bag only; (2) to-and-fro breathing through soda-lime canister and into bag; (3) canister closed both ends, bag closed and contents conserved, patient breathing air during change over. F, Bag. G, Soda-lime container.

FIG. 3.—End view.

face-piece drag does not occur, so no flexible junction is needed. Adjustment can be made: (*a*) horizontally, by rotating the angle-piece (J) in relation to the face-piece; (*b*) vertically, by varying the amount of inclination of the patient's head to the side.

Owing to the elimination of the flexible junction between the face-piece and the apparatus dead space is virtually excluded. Larger ports have reduced internal resistance to negligible proportions. The apparatus was also made for me by the Medical and Industrial Equipment, Ltd., of 12, New Cavendish Street, London, W.1.

IMMUNIZATION AGAINST INFECTION IN THE ARMY

In the recent Harben lectures Lieut.-Colonel H. J. BENSTED gave a valuable review of active immunization in the British Army.

Inoculation against Typhoid

Wright's first injection of typhoid vaccine in 1896 into two I.M.S. officers preceded much anxious work before inoculation was introduced into the Indian Army in 1906. In 1907 C. J. Martin's Committee assessed the evidence, and in 1914, when the war came, T.V., as typhoid vaccine was then called, was available for the immunization of the Expeditionary Forces. In 1915 T.A.B. was introduced. The wise author of the *Medical History of the War* safely prophesied that, as T.A.B. was superior to the vaccine used in the South African War, so would the vaccine of the future surpass the tried friend of 1914–18. From 1928 to 1932 the famous Rawlings strain of typhoid chosen by Leishman troubled the Army authorities responsible for vaccine production through its tendency to roughness in culture. In 1932 Grinnell showed that, though vaccination with certain strains protected mice against lethal doses of typhoid bacilli, the Rawlings strain then in use failed to do so. The Army group—Perry, Findlay, Bensted—and Felix supplied the key: an efficient vaccine must be derived from strains virulent to mice, giving smooth colonies and easily made suspensions and therefore containing O and Vi antigens. Our bacteriological enlightenment during this period is probably reflected in the reduction of enteric incidence in the Army in India from 4 per thousand in 1929 to 1.5 per thousand in 1936, during which time the civil incidence was raised. The Rawlings strain has been "rejuvenated," and, safely sealed on Dorsett egg medium or embedded in "lablemco agar," will continue its beneficent career. It is interesting here to recall that Greenwood and Yule were of opinion that the odds against the great reduction in enteric infections during the first world war being due to chance were 9,999 to 1.

It has been customary to give yearly to forces over-seas a reinforcing dose of T.A.B., the hypothesis being that the duration of immunity is short. Yet the laboratory staff at the Washington Army Medical School in 1939[1] found that the serum of volunteers who had been inoculated from two to ten years previously contained considerable amounts of mouse-protective antibody; after one intracutaneous dose of vaccine they showed as high titre as subjects who for the first time received the regular three doses of vaccine subcutaneously. Hahn, in the great Hanover epidemic in 1926, also found the incidence of infection among men aged 30 to 50 only half that of women of similar age, whereas between 10 and 30 the figure was the same for both sexes. Hahn attributed the escape of so many of the elder men to residual immunity from typhoid vaccination during their army days long previously.

An interesting sidelight on dosage is that in 1923 the half-starved refugees in Thrace responded to the inoculation of the T.A.B. vaccine with very severe reactions. The problem in the future is to maintain the present high immunizing potency of T.A.B. while eliminating the tendency to produce local pain and general malaise. Grasset[2] claims that the injection of efficient immunizing doses of his formolized bacillary extract causes no interruption of work among the coloured mine workers on the Rand. Should this hold good for large numbers of European children and adults the vaccine will be welcome—until in its turn it may be replaced by chemically pure antigen fractions. Colonel Bensted inclined to the view that the universal immunization of the civil population of England is unnecessary, but that since immunization during an epidemic gives virtually the same degree of protection as in non-epidemic periods inoculation may be kept in reserve for sections of the population who may be specially endangered at any time.

Cholera, Plague, Tetanus

Anti-cholera vaccination is in a different category from that with T.A.B. The long array of earnest workers since Ferran first made his injections in 1885 have not yet, in Colonel Bensted's opinion, proved the case for the value of anti-cholera inoculation; nevertheless, he believes that an immunity of short duration occurs. The Inaba and Ogawa strains used by the Army contain the all-important heat-stable O antigen.

It is not easy to assess the value of vaccination against plague, though Taylor's report indicates that the Haffkine vaccine confers a four-fold protection. Schütze's demonstration that the thermolabile envelope antigen produced during growth at 37° C. is essential for protection may result in higher efficiency in future vaccines.

For protection against tetanus in the Army we owe much to the efforts of General Marrian Perry, who in 1936 initiated work by Colonel Boyd at the Royal Army Medical College, in collaboration with the Wellcome Laboratories, to examine Ramon's findings. Toxoid recommended itself, though floccules and alum-toxoid were tried; since the replacement of Witte peptone by peptic digest in the preparation of toxoid, reports of anaphylactic reactions have become even rarer than before. The immunity of the inoculated soldier is sufficiently high to protect him against tetanus, and some 90% of our troops sent to the Continent were actively immunized, but the Army practice is to provide for the unimmunized; therefore all wounded men receive 3,000 international units of tetanus antitoxin, followed, if the patient has not been inoculated, by two weekly doses of 3,000 units. General Perry[3] reported that there have been a few cases of tetanus (actually eight) among unimmunized men, but none so far among the much greater number of immunized. Colonel Bensted called attention to the deadly danger, emphasized by Okell, Colebrook, recently Miles and his colleagues,[4] and others, of ward contamination of wounds with streptococci; he also mentioned—what probably is not so well known—that many extrafaucial infections with diphtheria in the first world war were undoubtedly due to cross-infection during war dressings. "Desert sores" were often found to be due to infection with diphtheria, and Bensted himself has recorded a persistent extrafaucial epidemic on the N.W. Frontier ended only by active immunization.

With regard to vaccination against smallpox, a large proportion of recruits have not been vaccinated in infancy and some of these suffer unusually severe reactions after vaccination. It was also clear from these lectures that the R.A.M.C. maintains a lively interest in vaccination with the stabilized attenuated strain of yellow fever virus cultivated on chick embryo at the Wellcome Bureau; in attempts to protect against influenza with a multivalent strain of influenza virus together with dog distemper virus; and in the Durand protection against typhus with centrifuged lung juice of heavily infected mice.

Colonel Bensted's lectures, though containing nothing strikingly new, constitute a timely record of the sterling work of the R.A.M.C. The British Army is one of the best protected in the world against infection.

[1] *Amer. J. Publ. Hlth.*, 1939, 29, 95
[2] *British Medical Journal*, 1939, 2, 58.
[3] *British Medical Journal*, 1940, 2, 364.
[4] Ibid., 1940, 2, 855.

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SATURDAY JANUARY 4 1941

MEDICAL PLANNING COMMISSION

As announced in this week's *Supplement*, the British Medical Association has set up a Medical Planning Commission. The matter has been under consideration for some time now in view of the changes that have taken place in the medical services since the beginning of the war. The English Royal Colleges and the Scottish Royal Corporations were invited to co-operate with the B.M.A. in this important work of reconstruction, and have agreed to do so. The Society of Medical Officers of Health, close collaborator of the Association in many matters for many years, has also promised to help. Other bodies represented are the Medical Women's Federation, the Faculty of Radiologists, and the Parliamentary Medical Committee. The Commission starts with a *tabula rasa* upon which to impress its recommendations for the future medical services of this country. It will be bound by no covenant other than its terms of reference, which are: To study wartime developments and their effects on the country's medical services, both present and future. This was amplified by the Chairman of Council at its recent meeting when he said that the time had come for the profession to give serious consideration to the problem of reconstruction and reorganization in the field of medicine in the post-war era.

The Commission has a great opportunity and an equally great responsibility—an opportunity to seize with both hands and a responsibility to call for much searching of heart and mind. It has among its numbers men of all shades of medical experience, and, incidentally, many who are well below the Psalmist's three-score years and ten. Those who are to live and to work in the future must have a prominent voice in deciding what that future shall be. But the visions of the younger men may well be framed in the experience of those whom the years have brought, not stagnation of mind, but the wisdom of maturity. The cynic will be tempted to doubt whether some seventy men, of whatever persuasion, are capable of reaching a common measure of agreement on matters of great moment. He will fear that fundamental principles will be watered down to a solution whose specific gravity will indicate the smallest possible amount of solid matter. He will forecast with glee that compromise will raise its accommodating head when a plain yea would settle a plain issue for men of sound sense. So those who doubt should hold it clearly in mind that the Commission in its full assembly is to be no more—and no less—than a forum for the discussion of the hard facts collected and classified by the committees and subcommittees formed from its number. The Commission is to be the market place in which its members, as sound Athenians, will discuss what is new and reject what is false. It will have one great advantage over the market place in that it will be presided over by a Chairman, whose qualities of tact, discrimination, and judgment will be taxed to the full.

The present war found the medical profession well prepared to play its essential part in the struggle in which the British Empire has now been engaged for some sixteen months. In October, 1937, the British Medical Association started the compilation, in its War Register, of a list of the medical men of this country in terms of their aptitude and desire for service with the Forces or on the home front. The response showed that there was no more loyal section of the population than the medical profession. But patriotism and loyalty have not stifled criticism. Rather has it been tempered in the fire of emotions from which self-interest and sectional interests have receded into the background. War has thrown up into sharp relief the deficiencies of our peacetime system of administering relief to the sick and of promoting and maintaining the health of the people. These deficiencies were, of course, plain enough to many medical men before the war, and the B.M.A. had formulated a series of constructive proposals to deal with them in its report published in 1938 on "A General Medical Service for the Nation," and in other documents. It now proposes to prepare for the return of peace so that Medicine may be ready to meet its responsibilities in a world in which many values will be changed, fresh conceptions of society will be formed, and in which new stresses and strains will appear in the moral, material, and economic fabric of the democracy we hold to be our rightful heritage.

BIOLOGY OF INFECTIOUS DISEASE

Throughout the Middle Ages, and indeed up to some seventy-five years ago when the last epidemic of cholera occurred in this country, infectious diseases were inevitably part of the experience of every citizen. Plague was endemic and at intervals epidemic in all large cities until well on into the seventeenth century; leprosy was without the walls; typhus, small-pox, and later cholera lay in wait for those—and they included the whole population—who flouted the laws of sanitary hygiene. To-day, however, in time of peace, infectious disease is only rarely of primary concern to urbanized Western man. Though he may be worried because his children have measles, annoyed that his office staff should go down with influenza, outraged on the rare occasions when he and his fellows are exposed to the risk of typhoid through contamination of the milk or water supply, he regards all these as matters for his doctor and the public health authorities. Even the doctor, in "resolving the enigma of the fever chart" for his own particular patients, has tended to forget that before all things he is a biologist, an actor in a biological drama which has for its plot the finding of a *modus vivendi* between parasites and their hosts.

When the environment is more or less stable an equilibrium is sooner or later reached, but if the environment is suddenly altered the relations between parasite and host may be violently disturbed. This explains why every major war that has ever taken place has been either accompanied or followed by epidemics of infectious disease. Totalitarian war, with its shifting of entire populations and its enforced return to a life in caves and shelters that man abandoned at the end of the Old Stone Age, gives no promise of differing from

previous conflicts in its association with crowd disease. Infection has once more become of personal interest and importance to us all. It is thus fortunate that in these critical times it is possible to refresh our knowledge of the broad biological aspects of disease by reading a book ably written by Dr. F. M. Burnet,[1] the assistant director of the Walter and Eliza Hall Institute, Melbourne. In his search for the basic facts underlying infection Dr. Burnet takes us back to the very origins of life itself. With our human egotism we are apt to think that man, with discoveries such as those of fire, of the wheel, and of how to work metals or domesticate animals, has alone been responsible for advances in the art of life. Actually the fundamental discoveries were all made by much more primitive organisms: one of these discoveries was that instead of building up the body directly from the air and from such constituents of the earth as are soluble in water it is far simpler to obtain one's food by feeding on other living organisms. To this discovery is due the development of animal life and of all forms of parasitism. Animal nutrition and parasitism are in fact identical in origin, and the work of Metchnikoff in pointing out the similarities between unicellular organisms such as the amoebae and the phagocytic cells of more complex animals is duly emphasized. Incidentally, anyone who wishes to gain some idea of what life was like in Metchnikoff's laboratory should read the entertaining biography of Dr. Etienne Burnet, the distinguished director of the Pasteur Institute of Tunis, written by his talented wife.[2]

The problem of who shall eat and who be eaten is thus a matter of aggression and defence, but whereas the methods of defence are fundamentally the same throughout the animal kingdom the aggressors vary greatly. Of the aggressive parasites, however, only protozoa, bacteria, and viruses are emphasized in Dr. F. M. Burnet's book, worms being dismissed in four lines. This omission is curious, since in tropical and subtropical countries more ill-health is caused by helminthic infections such as ankylostomiasis and bilharziasis than by any other disease, with the exception of malaria. Ankylostomiasis and bilharziasis, in fact, were mainly responsible for the increasing mummification of Egyptian civilization from the end of the Fourth Dynasty onwards. If the one aim of parasites is to obtain as much nourishment as possible at the expense of their hosts, the only real purpose in life would seem to be that of reproduction—an interesting side-light on Whitehead's dictum that the essence of life is that it exists for its own sake, as the intrinsic reaping of value. The death of its host, however, is a disaster for the parasite as much as for the host, and the most successful parasitism is that in which there is a balance between the defence mechanisms of the host and the aggressive actions of the parasite, so that neither host nor parasite is destroyed. An example of such a successful association is seen in the relation of the psittacosis virus to wild parrots, though if, as is suggested, psittacosis arose in Australia, it is difficult to conceive how this or a closely allied virus has become adapted to the fulmar petrel, *Fulmarus glacialis*, for the fulmar petrel is a North Atlantic and North Pacific species of strictly marine habit and can have had little association with the parrots of Australia.

Just as the delicate balance between host and parasite may be upset by changes in the host, so, too, variations may occur in the parasites and new diseases may arise. Apart from encephalitis lethargica, no fewer than ten new virus diseases affecting man have been described in the past twenty-five years, and of these at least nine are capable of attacking the central nervous system. Some of these infections, such as Rift Valley fever and louping-ill, are probably new only in the sense that they have been newly discovered; but with some of the others, such as St. Louis encephalitis, the evidence suggests that they really are of recent development. Although Dr. Burnet does not mention it, unequivocal evidence of a new disease arising in historical times is forthcoming in the case of myxomatosis of rabbits, which must undoubtedly have developed since the Spanish conquest of South America. If, as John Donne remarked long ago, "with new diseases on ourselves we war," it is by no means inconceivable that infectious diseases may have an important part to play in determining the shape of things to come, and a really serious world-wide epidemic would probably do more to set going a sense of genuine co-operation than anything else. Unfortunately, notwithstanding our increased knowledge of infectious diseases, the control of such a pandemic might not be easy, despite the encouraging example set by the hero of James Bridie's *Sleeping Clergyman*.

[1] *Biological Aspects of Infectious Disease.* By F. M. Burnet, M.D. Cambridge University Press. 1940. (15s. net.)

[2] *Etienne Burnet: Un Humaniste Français de son Temps.* By Lydia Burnet. Tunis: Bascone and Muscat. 1939.

TREATMENT OF TETANUS

The occurrence of three fatal cases of tetanus in children within a relatively short time led the staff of the department of paediatrics in the College of Medicine, State University of Iowa, to reconsider the treatment employed. This happened about seven years ago, and now Dr. Ralph Spaeth has recorded[1] the clinical histories of approximately the same number of patients with tetanus treated before and since 1933, when modifications were introduced. The principles of the treatment now employed include the systematic use of sedatives, intravenous injection of antitoxin, conservative surgery, and careful general management. With regard to the last, Spaeth urges the creation of special units in charge of persons drilled periodically. For the cases admitted to the University Hospital in Iowa City a printed outline of treatment has been drawn up to facilitate nursing care, especially as regards the maintenance of an adequate fluid and caloric intake and measures to prevent pneumonia. In order to secure an adequate sedative effect avertin is given per rectum with amylene hydrate. Sodium amytal has also been used alone or in conjunction with avertin, and Spaeth recommends an intramuscular injection of a 10% aqueous solution. As to antitoxic therapy, it is stressed that early and intensive treatment must be given to all patients in order to save perhaps only a limited number. In the Iowa new series (since 1933) the intravenous route has been used as the most satisfactory and the dosage has varied between 10,000 and 80,000 units as a single injection. The intrathecal route is strongly condemned. The routine now adopted is 60,000 units for patients admitted during the first five days of the disease and 40,000 units for the mildly to moderately ill patients first treated late. Spaeth sums up as follows the views on surgery of the Iowa school: "Surgical treatment of tetanus ordinarily is not an emergency procedure," and, "The principles of surgery to be followed

[1] *Amer. J. Dis. Child.*, 1940, 60, 130.

in the treatment of tetanus are identical with those recommended in the absence of this disease." In considering the general management of the patient particular care is directed against the risks of pneumonia. When there is prolonged rigidity of the thorax inhalations of carbon dioxide (5 to 10%) in oxygen for ten minutes or so at four-hourly intervals are recommended. Change of position, tepid baths, protection from draughts, and measures to deal with secretions in the mouth or nasopharynx, even including mechanical suction, are all mentioned as important. At the same time an optimal fluid and calorie intake must be obtained, but with a minimal disturbance to the patient. Spaeth emphasizes that it is much more important to keep the patient quiet than to meet theoretical metabolic needs. In discussing the prognosis, comparison is made between the results of the older and the present programmes. Here at once comes the difficulty of the degree of severity of the cases encountered. On a classification of the disease as mild, moderate, and severe, it is found that the incidence of mild tetanus was considerably lower in the new series than in the old. Only seven out of thirty-three patients treated in the past seven years could be called "mild," as compared with seventeen out of thirty-three treated by the older methods. Nevertheless the total mortality rates showed a difference of 9% in favour of the more recently treated patients. The results among those moderate and severe cases admitted during the first four days of the disease showed that the newer methods of treatment secured thirteen recoveries and that there were nine deaths, as compared with three recoveries and ten deaths in the similar groups treated before 1933. Spaeth concludes with a strong plea for the production of active immunity among the population as a whole by the use of toxoid, as with prophylaxis against diphtheria. He also urges the more intelligent use of antitoxin. "Physicians who have encountered numerous cases of tetanus are inclined to administer antitoxin for practically all injuries, whereas those with more limited experience are prone to withhold serum in the presence of minor wounds." Spaeth sums up the indications for the use of antitetanic serum as follows: blank cartridge and powder injuries, penetrating wounds, dirty lacerations, infected burns, self-induced abortions, and injuries of any type in which contamination with soil, dust, or animal dung might have occurred. He suggests 5,000 units as a suitable prophylactic dose, although more is often employed. It should be pointed out that although the majority of the patients discussed in the review were children some adults are also included.

The most debatable item in this policy is the embargo on the intrathecal injection of antitoxin. Sherrington's classical experiments on the effect of antitoxin given by different routes point clearly to the intrathecal as the most effective, and recent observations on the same lines by W. M. Firor[2] lead to the same conclusion. Dogs were given approximately double a lethal dose of tetanus toxin intravenously, and treated with a moderate amount of antitoxin some fifty hours later, when signs of tetanus had become manifest. When this was given by the intracisternal route only three out of thirty-six died, whereas the same dose given intravenously saved only six out of twenty-five. The lumbar intrathecal route was rather less effective than the intracisternal, but still much superior to the intravenous. The treatment of animals with more advanced tetanus was naturally less successful, but even here the results favoured intrathecal administration. Clinical evidence to the same effect and on an impressive scale was put forward by B. B. Yodh[3] in this *Journal* eight years ago. This is therefore at least an open question, if indeed Spaeth's conclusion is not positively wrong.

[1] *Arch. Surg.*, 1940, 41, 299.
[2] *British Medical Journal*, 1932, 2, 589.

TREATMENT OF FROST-BITE

Frost-bite, owing to the conditions of trench warfare in the winter months, was a frequent cause of disability during the war of 1914–18, but it has not reached serious proportions in the rather different circumstances of the present war. In the meantime some valuable contributions have been made to the study of peripheral vascular diseases and their treatment by sympathetic denervation. Three recent papers, all of them brief because the work was carried out under conditions of military necessity, make out a good case for fuller and more carefully controlled investigation of the treatment of frost-bite of the hands and feet on the lines of surgery of the sympathetic nervous system. Soupault and Orsoni[1] record a case of bilateral frost-bite of the feet which developed some days after prolonged exposure in the wet and cold. The feet were discoloured, oedematous, cold, and painful, and it was thought that a bilateral Syme's operation would be necessary. After a series of lumbar injections of syncaine there was a marked improvement in the local signs and the subjective symptoms, and ultimately the patient lost only the tips of three toes on one side and the tip of one on the other. Five similar cases recorded by Simon and Filhoulaud,[2] none of them as severe as many seen during the last war, did not come under observation for seven to nine days after the onset of the frost-bite. Two were treated by lumbar injections of novocain and the others by femoral sympathectomy. Good circulatory responses were obtained in all, and it is claimed that necrosis was thereby limited and healing facilitated. Forster and Wiederkehr[3] report the case of a patient who developed frost-bite in one hand after motor-cycling in intense cold and came under observation eight days later. The stellar ganglion was injected by the method of Leriche and Fontaine; vasodilatation, diminution in the swelling and pain, and rapid healing followed. Under conditions of warfare frost-bite is likely to attack young men with healthy arteries—that is, excellent subjects for surgery of the sympathetic nervous system. An approach on these lines is a rational one, since the smaller arterioles are in a state of spasm. At the same time the gangrenous process is one which spreads from the surface towards the deeper tissues. The elimination of vasoconstriction may in the early stages prevent the onset of gangrene, or, when gangrene is established, may limit its spread, diminish pain, assist in the separation of dead tissue, and promote healing.

PSYCHO-ANALYSIS AND PSYCHOSES

Psychiatry, like anthropology generally, owes a great debt to Freud and some of his pupils. They have made some dry bones live, and illumined much that was mysterious. In particular, as by now every schoolboy knows, psycho-analysis has transformed our outlook, if not our treatment of what is conveniently and, *pace* some writers, even scientifically segregated as "psychoneurotic" reaction types. If some people of simple mind have sought to see behind every hysterical paralysis a fixation of the libido at the genital level, this is not the fault of the founder of psycho-analysis. But his success in describing the mental processes in a case of paranoia in "dynamic" terms—that is, as the interplay of competing "mental forces" derived from fundamental instincts and attitudes—has tempted his followers to present a "psycho-analytic psychiatry" *in the sense not only* of a description of psychotic phenomena but in the sense also of causal explanation. For example, Rickman some years ago tabu-

[1] *Mém. Acad. Chir.*, 1940, 66, 358.
[2] Ib'd., 359.
[3] Ibid., 367.

lated the various psychotic syndromes in terms of levels of libidinal development, especially of fixations and regressions therein, and seemed to suggest, in Birnbaum's famous term, a pathogenic as well as a pathoplastic function for these miscarriages. It is true that a schizophrenic dissolution does sometimes allow to appear in full consciousness, as if the repressive barrier had been burst, a set of feelings and ideas which form a textbook illustration of the truth of Freud's views as to the latent content of some people's minds. But is this causal or indicative of at least a constant time-sequence; or is it concomitant only? Is it the complex and the resultant conflict with reality that have disrupted the patient's mind; or has the latter only dissolved backwards along the lines of its evolution? Are we contemplating the volcanic forces behind the earthquake; or only the ruins? This is a question to which there is as yet no agreed answer; but some psycho-analysts appear to have no doubt. This attitude is less excusable when, for example, in a recent paper by Silbermann[1] the facts of observation do not present themselves in ready-made Freudian form but are reformulated by the observer in psycho-analytic language and are then said to "explain" the psychiatric process—in this particular instance a process, under the influence of shock therapy, towards recovery. Briefly, Dr. Silbermann's notion in everyday language is this. The patient receives an alarming form of treatment by which he is so frightened that he appeals to God (a father-figure), having previously neglected the existence of anyone outside himself. Now, however, he remembers to love someone other than his own image. The crucial point at which the patient undergoes the significant psychical experience of complete helplessness is considered to be the few seconds preceding the coma, which is "the deepest level of unconsciousness." But why should this be more significant than other similar kinds of experience—the stages of chloroform narcosis preceding complete unconsciousness, for example? Why, above all, if care is taken to avoid this ultimate experience, as in the method of precardiazol narcotization by N_2O or cyclopropane, or in the electrical method of evoking convulsions, does recovery still occur? This attempt to give a fundamentally psychological, and more particularly a psycho-analytic, account of what happens in shock therapy is another example of the tendency to elevate psychological description into explanation, of which the symbolic interpretation of an epileptic fit, cited in this paper by Dr. Silbermann, is a traditional and, to some minds, particularly unfortunate example, tending to bring the whole of psycho-analytic theory into discredit.

TREATMENT OF TRICHOMONIASIS IN MALES

Although *Trichomonas vaginalis* infestation in males is thought to be comparatively rare, and is certainly so when compared with the incidence of the condition in females, there is evidence that it is commoner than is generally supposed. In many cases, no doubt, the presence of the organism causes no symptoms, but routine examination of cases of chronic gleet would probably reveal trichomonads in a fair proportion. The protozoon, should it succeed in penetrating between the epithelial cells lining the urethra, may produce stricture,[2] and infection of the prostate, bladder, and kidneys may give rise to serious symptoms. Accurate diagnosis and a knowledge of the conditions which favour the growth of this protozoon are essential for successful treatment. Excellent work on this has been done by Liston,[3] who found that the organism thrives best at a *p*H of about 5.5, but cannot long survive at a *p*H of 4—that of the normal vagina—or at one of 7 to 7.5.[4] Early treatment should therefore be the aim, and an attempt should be made to render the urine neutral or slightly alkaline as quickly as possible. For this purpose the bicarbonates and citrates of potassium or sodium are most useful, and they should be persevered with because of the tendency to relapse if treatment is stopped too soon. On the other hand, it would appear, in theory at any rate, that mandelic acid therapy in the form of calcium mandelate might be successful, but it is doubtful whether it would be possible to keep the *p*H at a low enough level for a sufficient length of time to destroy all the organisms. Acriflavine, given orally in half-grain "enteric-coated" tablets, and sulphanilamide have been tried with doubtful success. Various local remedies, including devegan or stovarsol, silver picrate, and negatol, have been used successfully in cases of vaginitis. Negatol may be employed in the male as a urethral irrigation or instillation in a strength of 1% to 2%. Experience has shown that routine irrigation with the usual antiseptics, such as potassium permanganate, is not only useless but may be positively harmful, though some workers employ mercury oxycyanide. Where the infestation is only superficial maintenance of a urine *p*H of 7 to 7.5 will probably be successful, but when the submucous tissues are involved local treatment is indicated. In all cases failing to clear up with alkalis an endeavour should be made to locate lesions in the urethral canal. Infected follicles and submucous infiltrates, which if left untreated might lead to stricture formation, should be dealt with by either massage over a straight sound or the use of Kollmann's dilator. In some instances it may be necessary to employ the cautery, which should always be followed by dilatation, as strictures are more easily prevented than cured. If symptoms of prostatitis occur appropriate treatment consists in regular massage and diathermy. Cystitis has been treated successfully by daily irrigation with 1 in 1,000 nitrate of silver, and pyelitis by lavage of the pelves of the kidneys with 2% mercurochrome; in both these conditions it is worth while keeping the urine alkaline. It cannot be too strongly stressed that success in treatment depends on starting it before the organisms have got out of reach beneath the mucous membrane, and on maintaining it for some time after all symptoms have subsided. Nor should it be forgotten that in the case of a married man the wife is almost certainly infected also, and it is useless to treat the one and not the other.

[1] *Int. J. Psycho-anal.*, 1940, 21, 179.
[2] *Surg. Gynec. Obstet.*, 1940, 71, 369.
[3] *Brit. J. Vener. Dis.*, 1940, 16, 113.

INTRANASAL IMMUNIZATION

The Chinese for many centuries, it is said, have attempted to produce immunity against small-pox by the intranasal instillation of variolous material. That this method of immunization has a sound scientific basis has been proved by a number of observations during the past few years, while the method has been shown to be applicable to a wide variety of antigens. Attention to the possibilities of producing immunity against diphtheria by intranasal instillation was first directed by Ramon and Zoeller[5] and later by Jensen,[6] who immunized a number of children with diphtheria toxoid by this route. Fraser, Davey, and Halpern[3] in Canada have now further studied the antitoxin response in children and adults treated intranasally with concentrated and purified diphtheria toxoid, the preparations used having Lf values of 900 and 850 per c.cm. The technique consisted in soaking a small pledget of

[4] *C. r. Soc. Biol.*, Paris, 1927, 97, 701.
[5] *Proc. roy. Soc. Med.*, 1937, 30, 1117.
[6] *Canad. Publ. Hlth. J.*, 1940, 31, 376.

absorbent cotton-wool in 0.5 c.cm. of toxoid and inserting it through the anterior nares till it rested between the septum and the anterior end of the inferior turbinate. The pledget remained in the nose from fifteen minutes to six hours. The antitoxin titre was tested before and after immunization, and though the individual response varied greatly, 83% of the entire group showed a good response. The Canadian workers, however, regard intranasal instillation as more suitable for reinforcing antitoxic immunity than for primary inoculation. In Japan, Kodama, Sato, and Hata[1] believe that by intranasal instillation of toxoids it is possible to bring about an effective immunity against such conditions as diphtheria, tetanus, and streptococcal and staphylococcal infections. The effects of nasal immunization are said to be more definite if, instead of saline solutions, glycerin carbolic saline solutions of the toxoids are used, as these mixtures permit much longer contact with the nasal mucosa. No undue reaction was noted in children when they were treated with a mixture of different toxoids—in fact, the effect on the production of antitoxins was more pronounced than when only a single toxoid was employed. Intranasal reimmunization invariably stimulated a rapid and high production of antitoxin. The possibility of immunizing against whooping-cough by the intranasal route has also been considered by Dow.[2] Mice, it was found, could be actively immunized intranasally with the antigens of *Haemophilus pertussis*, the results being sufficiently clear-cut to admit of a comparison of the antigenic powers of various antigenic fractions. Actually, whole vaccines of *H. pertussis* gave more effective immunization than so-called soluble antigens. After the successful immunization of mice by intranasal instillation, active immunization of human beings was attempted, the nasal mucosa being first treated by an instillation of gluco-fedrine. No unpleasant reactions were encountered, and the serum of one person so immunized was found to possess sufficient antibody to be used prophylactically with success in two children who had been exposed to infection with whooping-cough.

[1] *Kitasato Arch. exp. Med.*, 1940, **17**, 155.
[2] *Canad. publ. Hlth. J.*, 1940, **31**, 370.

BAN ON HIGH-FREQUENCY APPARATUS

It is necessary to draw attention once more to the restrictions which have been placed by an Order of the Home Office on the use of high-frequency apparatus. Although the Order, which was published in full in the *Journal* of September 7 (p. 333), came into effect on September 2, many practitioners still possess high-frequency apparatus without being aware that they should have reported the fact. The Order provides that no person may have such apparatus in his possession except under permit of the Postmaster-General. The apparatus includes diathermy and electro-medical equipment using valves or spark coils. Unauthorized possession constitutes an offence under the Defence Regulations, and any possessor who has not either applied for a permit from the Engineer in Chief, Radio Branch, General Post Office, Harrogate, or reported his possession to the local police, should do so at once. At the time the Order was issued the British Medical Association sent an expert representative to discuss the matter with the authorities concerned, and it was found, and later agreed by the Physical Medicine Group Committee of the Association, that the measures taken were fully justified and "were in no way out of proportion to the exigencies of the moment." The immediate object was to reduce the number of sources of electrical disturbance and to effect some measure of centralization which would facilitate exercise of control and enforcement of precautions directed towards the abolition of interference by screening and the use of filters. This is a Home Office Order made under the Defence Regulations, and owners of apparatus to which it refers must make known that fact in their own interests and those of national security.

THE NEW YEAR HONOURS LIST

A list of the New Year Honours conferred on members of the medical profession will be found at page 25. A baronetcy has been conferred on Mr. Hugh Lett, President of the Royal College of Surgeons. The Hon. Godfrey Martin Huggins, F.R.C.S., Prime Minister of Southern Rhodesia since 1933, receives the K.C.M.G. The K.C.I.E. has been bestowed on Major-General E. W. C. Bradfield, medical adviser to the Secretary of State for India and lately Director-General, Indian Medical Service. Dr. J. H. Hebb, Director-General of the Emergency Medical Services, Colonel C. T. Champion de Crespigny, a leading Australian physician, and Brevet Colonel Ram Nath Chopra, Professor of Pharmacology and Director of the School of Tropical Medicine, Calcutta, receive the honour of Knighthood. Dr. A. G. H. Smart, medical adviser to the Secretary of State for the Colonies, and Dr. R. T. Leiper, F.R.S., Professor of Helminthology in the University of London and Director of the Department of Parasitology at the London School of Hygiene and Tropical Medicine, both receive the C.M.G. Members of the British Medical Association will note with pleasure that Dr. R. W. Craig, Scottish Secretary, has been awarded the O.B.E., and Mr. A. T. Twelftree, Chief Clerk to the Association and to the Central Medical War Committee, the M.B.E.

"MEDICAL DIRECTORY," 1941

The ninety-seventh edition of the *Medical Directory* has been published by Messrs. J. and A. Churchill, Ltd. The typographical improvements introduced last year are repeated, and the arrangement of the *Directory* and its price (42s.) remain the same. There has been a net increase of 1,457 entries, while the number of pages of text has increased by thirty-two. The numerical summary of the medical profession shows that there are now 64,304 names, compared with 62,847 in 1940. Increases will be found in most of the sections of the *Directory*: 895 under Provinces, 75 under Abroad, 277 under Scotland, 265 under Ireland, and 96 under Wales. Two decreases are recorded: 85 under London and 66 under Services.

Dr. R. A. O'Brien, C.B.E., who joined the staff of the Wellcome Physiological Research Laboratories at Beckenham in 1910 and became director in 1914, retired at the end of 1940. Dr. J. W. Trevan, who became head of the pharmacological section in 1920, has been appointed to succeed him.

Already about 100 fully trained State-registered nurses have been allocated to various London boroughs for shelter work. More nurses, either trained or auxiliary, have been supplied locally, and the total available is now over 300. Fully trained nurses receive an inclusive salary of three guineas a week. Hours of duty are approximately ninety-six a fortnight, involving alternate nights on duty while the hours of blackout are at their longest. Four part-time shelter matrons are being appointed by the Ministry of Health to visit and supervise the nursing personnel in the shelters in consultation with the medical officers.

HEALTH IN THE SHELTERS

FURTHER RECOMMENDATIONS BY LORD HORDER'S COMMITTEE

Further proposals of Lord Horder's Committee on health in air raid shelters have been presented to Parliament by the Minister of Health and the Minister of Home Security and are now published as a White Paper.* The recommendations and the action of the Government taken thereon are printed below.

Tuberculosis

(i) That arrangements be made to hospitalize at once cases of "open" tuberculosis known to frequent shelters. If necessary, compulsory powers should be taken to effect this.

(ii) As far as possible each tuberculous family should have a family shelter and should obtain priority in the issue of an Anderson shelter or of other assisted shelter accommodation.

Local Authorities and Medical Officers of Health have been urged to see that action is taken along these lines. The necessary compulsory powers have been obtained.

Louse Infestation

(i) The Committee endorsed the action taken by the Ministry of Health for arranging (*a*) short courses of instruction at the London School of Hygiene for shelter wardens; and (*b*) the preparation and issue of a short pamphlet suitable for shelter wardens giving briefly the essential facts in the life history of the louse, the flea, and the bed-bug, and summarizing simple measures for dealing with these pests.

(ii) Selected insecticides should be made available and the methods of their application should be submitted to trial. The method or methods chosen should be set out in a leaflet for the guidance of wardens acting under medical supervision.

(iii) If compulsory powers to delouse do not at present exist they should be taken immediately.

(iv) The advisability of obtaining more accurate information in regard to the incidence of louse infestation in shelters is recognized. To this end the inquiries which have been already set on foot should be extended to other areas.

Medical officers of health are now reviewing the facilities available in their areas for cleansing. Where these are inadequate the necessary cost of making additional provision to meet the needs of persons attending public shelters will be reimbursed to the local authorities by the Ministry of Health. The Ministry is also taking steps to establish a supplementary service of mobile disinfesting units so far as supplies of necessary materials and labour permit. Quantities of the insecticides recommended have been ordered, and instructions for use, based on the results of trials, will be issued. The compulsory powers referred to have been obtained. The investigation of lice incidence will be extended as soon as methods and technique are further developed.

Bug infestation in Shelters

(i) In the construction of shelters, bunks, and other fittings, measures should, as far as possible, be taken to avoid cracks, crevices, and other harbourages for insects. To this end the Committee suggests that the practicability of treating all internal walls with impermeable paint to render them impervious to bugs should be investigated.

(ii) When a shelter is found to be infested the Committee suggests the adoption of the following method, which should result in a large measure of success, namely:

An organized system of cleaning and scrubbing and the liberal use of soap and water containing cresol. The use of a painter's blow lamp carefully applied to all cracks, etc., is an excellent simple method, which is generally applicable for small infestations.

Instructions on this matter are on the point of being issued to the authorities concerned.

Chemicals in Latrines

In view of the need for economy the Committee would point out that it is usually unnecessary to use disinfectants in latrine containers when these are being flushed or emptied frequently and regularly.

Instructions are being issued on this.

Masks

In response to a request from the Minister of Health the question of the use of masks by shelter users was submitted to an *ad hoc* Committee. Two representatives of the Medical Research Council were co-opted and have carried out helpful researches. The following tentative recommendations have been accepted by the main Committee. Meanwhile the researches referred to are being continued.

(i) The principle of the mask for reducing the risk of droplet infection is sound and should be capable of practical application.

(ii) It seems desirable to choose as a standard a type of mask that will best serve the dual purpose of reducing the spread of micro-organisms from an infected person, and, at the same time, of protecting as far as possible the uninfected person.

Bearing in mind the importance of availability of material, ease of adjustment to the face, and rapidity and thoroughness of disinfection, in addition to the main consideration of actual protection, a cellulose acetate (cellophane) screen, 5½ in. square supported by an elastic cord, is considered to be the best for standard purposes. A suitable number of such masks should be ordered so as to meet the arrival of any contingency. To obviate an unforeseen difficulty in the supply of cellophane, masks of the gauze type, consisting of at least four layers of muslin of at least forty-four threads to the inch, should also be ordered.

(iii) The yashmak type of mask, which some persons prefer to wear, and which is being commercialized, is regarded favourably by the Committee.

(iv) A memorandum for the information of medical officers of health concerning the use of masks should be issued. A leaflet should also be prepared for issue to shelter users when the necessity arises.

Orders for large numbers of the types of masks recommended in subsection (ii) above have been placed, and arrangements are being made whereby further supplies may be quickly obtained should the necessity arise. A memorandum and leaflet on the lines proposed in subsection (iv) have been prepared.

Lozenges, Gargles, and Throat Sprays

The Committee has considered the use of certain reputed prophylactic measures such as medicated lozenges, gargles, and throat sprays. From the evidence placed before it the Committee concludes that there are not sufficient grounds on which to recommend any of these methods as part of the general hygiene campaign against infection in shelters. At the same time the Committee does not wish to discourage the use of these measures by individual shelter users. It does not, however, advise that these kinds of medicaments be included in the list of drugs supplied by Government.

Smoking

(i) In the interests of public health, smoking should be prohibited in public shelters except where a separate compartment can be set aside for smokers.

(ii) This prohibition does not, of course, apply to any form of domestic shelter or domestic communal shelter.

(iii) Facilities for smoking can usually be provided in the brick surface public shelters by setting aside a compartment for the purpose.

(iv) It is suggested that, in order to avoid confusion in the public mind, the different categories of shelter should be carefully explained to the Press if, and when, this recommendation is handed to them.

* H.M. Stationery Office. Cmd. 6245. (Price 1d. net.)

The Public Shelter Rules made under Regulation 23AB of the Defence (General) Regulations, 1939, contain provisions enabling smoking to be prohibited or controlled according to circumstances.

Other Points under Consideration

The Committee is sponsoring certain controlled experiments with some of the newer forms of chemotherapeutic drugs, used as nose and throat sprays under medical supervision, and these are still in progress.

NEW YEAR HONOURS

The names of the following members of the medical profession were included in a New Year Honours List published in a Supplement to the *London Gazette* on December 31, 1940.

Baronetcy

HUGH LETT, C.B.E., M.B., Ch.B. President of the Royal College of Surgeons of England.

K.C.M.G.

The Hon. GODFREY MARTIN HUGGINS, F.R.C.S. Prime Minister of Southern Rhodesia since 1933. On the occasion of the Jubilee celebrations of the Colony.

K.C.I.E.

ERNEST WILLIAM CHARLES BRADFIELD, C.I.E., O.B.E., M.B., M.S., F.R.C.S.Ed. Major-General, Indian Medical Service. Medical Adviser to the Secretary of State for India and lately Director-General, Indian Medical Service.

Knighthood

RAM NATH CHOPRA, C.I.E., M.D. Brevet Colonel I.M.S. (ret.). Professor of Pharmacology and Director, School of Tropical Medicine, Calcutta.

CONSTANTINE TRENT CHAMPION DE CRESPIGNY, D.S.O., V.D., M.D., F.R.C.P. For public services in the Commonwealth of Australia.

JOHN HARRY HEBB, C.B., C.B.E., M.B., B.Ch. Director-General, Emergency Medical Services, Ministry of Health.

C.B. (Military)

ROBERT WALTER DICKSON LESLIE, O.B.E., L.R.C.P. & S.I. Major-General, late Royal Army Medical Corps. Honorary Physician to the King.

JOHN WALTER LENNOX SCOTT, D.S.O., M.R.C.S., L.R.C.P. Major-General, late Royal Army Medical Corps. Honorary Physician to the King.

CECIL PEMEREY GREY WAKELEY, D.Sc., F.R.C.S., F.A.C.S., F.R.A.C.S. Temporary Surgeon Rear-Admiral, Royal Navy.

C.S.I.

HUGH CLIVE BUCKLEY, M.D., F.R.C.S. Major-General, Indian Medical Service. Honorary Physician to the King. Lately Surgeon-General with the Government of Bombay.

C.M.G.

JOSEPH WELSH PARK HARKNESS, O.B.E., M.B., B.Ch., D.P.H., Colonial Medical Service. Director of Medical Services, Gold Coast.

ROBERT THOMSON LEIPER, D.Sc., M.D., F.R.S., F.R.C.P., Professor of Helminthology in the University of London and a Director of the Department of Parasitology, London School of Hygiene and Tropical Medicine.

ERIC DENHOLM PRIDIE, D.S.O., O.B.E., M.B., B.S. Director of the Sudan Medical Service.

ARCHIBALD GUELPH HOLDSWORTH SMART, M.B.E., M.D., D.P.H. Medical Adviser to the Secretary of State for the Colonies.

BERNARD TRAUGOTT ZWAR, M.D., M.S., F.R.A.C.S. President, Royal Melbourne Hospital, State of Victoria. For public services.

C.I.E.

DAVID CLYDE, M.D., D.P.H. Lieutenant-Colonel, Indian Medical Service. Civil Surgeon, Lucknow, United Provinces.

WALTER HUGH CRICHTON, M.B., Ch.B., D.P.H. Lieutenant-Colonel, Indian Medical Service. Chief Health Officer, Delhi.

HENRY HAWES ELLIOT, M.B.E., M.C., M.B., B.S., F.R.C.S. Lieutenant-Colonel, Indian Medical Service. Surgeon to His Excellency the Viceroy.

HENRY EDWARD SHORTT, M.D. Lieutenant-Colonel, Indian Medical Service. Director, King Institute, Guindy, Madras.

C.V.O.

EDMUND CLAUD MALDEN, M.B., B.Ch.

C.B.E. (Military)

ROBERT FRANCIS PRESTON CORY, M.R.C.S., L.R.C.P. Surgeon Captain, Royal Navy.

FRANCIS ROSSALL SANDFORD, M.C., M.B., B.Ch. Colonel, late Royal Army Medical Corps.

C.B.E. (Civil)

Lady RUTH BALFOUR, M.R.C.S., L.R.C.P., Chairman, Women's Voluntary Services for Civil Defence in Scotland.

THOMAS HERBERT GODDARD, M.B. For devoted services to public and philanthropic movements in the State of Tasmania.

ARTHUR HUTTON MCSHINE, O.B.E., M.D., C.M. For public services in Trinidad.

Mrs. RUTH YOUNG, M.B.E., M.B., Ch.B., Women's Medical Service. Lately Principal, Lady Hardinge Medical College, Delhi.

M.V.O. (Fourth Class)

GEORGE PROCTOR MIDDLETON, M.B., Ch.B.

O.B.E. (Military)

REGINALD ANSON MANSELL, M.B.E., M.B. Major, Royal Army Medical Corps.

ALFRED WILLIAM NORTH, L.M.S.S.A. Surgeon Commander, Royal Navy.

ARNOLD ASHWORTH POMFRET, M.B., Ch.B., D.O., D.O.M.S. Surgeon-Commander, Royal Navy.

O.B.E. (Civil)

Mrs. KATIE ARDILL-BRICE, M.B., Ch.M. For philanthropic and welfare work in the State of New South Wales.

JAMES HAMILTON CAMPBELL, D.S.O., M.B., B.Ch. Colonel, Royal Army Medical Corps (retired). Air Raid Precautions Controller, Kent.

ROBERT WILLIAM CRAIG, M.D. Scottish Secretary, British Medical Association. For services in connexion with civil defence.

CLYDE CORNWALL FENTON, M.B. Flying Officer, Royal Australian Air Force. Lately Medical Officer, Northern Territory Medical Service, Commonwealth of Australia.

SYDNEY NUTTALL HAYES, F.R.C.S., F.R.C.O.G. Lieutenant-Colonel, Indian Medical Service. Professor of Midwifery, King Edward Medical College, Lahore, and Medical Superintendent, Lady Willingdon Hospital, Lahore, Punjab.

GEORGE KINNEARD, M.D. Colonial Medical Service. Senior Medical Officer, Falkland Islands.

GOPAL DAS MALHOUTRA, M.B., B.S. Lieutenant-Colonel, Indian Medical Service. Civil Surgeon, Moradabad, United Provinces.

SULTAN BAKSH MALIK, M.R.C.S., L.R.C.P. For public services in the Tanganyika Territory.

SHAMRAO RAMRAO MOOLGAVKAR, F.R.C.S. Professor of Surgery, Grant Medical College, and Honorary Surgeon, J.J. Hospital, Bombay.

ARTHUR AUBREY PALMER, M.B., C.M., F.R.C.S. For public services in the State of New South Wales.

JOSEPH FRANCIS ENGLEDUE PRIDEAUX, M.R.C.S., L.R.C.P. Director of Medical Services, Ministry of Pensions.

JOHN WIGHTMAN STIRLING, M.B., Ch.B., J.P. Principal Medical Officer, Bechuanaland Protectorate.

MOORE TAYLOR, M.D., D.P.H. Major, Indian Medical Service. Superintendent, European Mental Hospital, Kanke, Ranchi, Bihar.

M.B.E. (Civil)

FRED BARRETTO, L.M. & S., D.P.H. Assistant Director of Public Health, in charge of the Public Health Laboratory, Poona, Bombay.

GERALD HUGH BLAKER. Captain, Indian Medical Department (retired).

Miss MARIE CÔTÉ. Retired Medical Practitioner, Thandaung, Toungoo District, Burma.

Mrs. DOSSIBAI JEHANGIR RATANSHAW DADABHOY, M.D., M.R.C.P. Honorary Consulting Surgeon, Cama and Albless Hospitals, Bombay.

Rai Bahadur NAGENDRA NATH DUTT. Honorary Captain. Medical Practitioner, Calcutta.

CHARLES NORMAN GRIFFIN, M.D. Colonial Medical Service. District Medical Officer, St. Kitts, Leeward Islands.

WILLIAM ST. ALBAN HENDRICKS, L.M.S. Assistant Surgeon. Civil Surgeon, Gangtok, Sikkim.

Miss URSULA MARIE LOBO. Women's Medical Service, Junior Branch, Shegaon, Buldana District, Central Provinces and Berar.

ANTONIO JOSE NORONHA, M.D., F.C.P.S. Lecturer in Bacteriology and Pathology, B.J. Medical School, Poona, Bombay.

ANTONY JOHN SELVEY. Assistant Surgeon. Acting Vice-Consul and Medical Officer, British Consulate-General, Kashgar.

SAYAD HABIBULLAH SHAH. Major, Punjab Civil Medical Service, *Army in India Reserve of Officers*. Superintendent, Old Central Jail, Multan, Punjab.

WILFRID REGINALD TAYLOR, M.R.C.S., L.R.C.P., D.P.H. Assistant Medical Officer, Grimsby. For services in connexion with civil defence.

RAGHUNATH SABAJIRAO TIRODKAR, M.D. Professor of Medicine, Grant Medical College, and Honorary Physician, J.J. Hospital, Bombay.

D.S.C.

THOMAS BENEDICT FITZGERALD, M.B., Ch.B. Surgeon Lieutenant, Royal Naval Volunteer Reserve.

JOHN THOMAS, M.R.C.S., L.R.C.P. Surgeon Lieutenant, Royal Navy.

M.C.

KEVIN CORMACK DONOVAN, M.B., B.S. Flight Lieutenant, Royal Air Force Volunteer Reserve.

Air Force Cross

HUGH WOLFE CORNER, M.D., Ch.B., M.R.C.P. Wing Commander, Royal Air Force.

Bar to Kaisar-i-Hind Gold Medal

Mrs. OLIVE MONAHAN, M.D. Chief Medical Officer (retired), Kalyani Hospital, Madras.

Kaisar-i-Hind Gold Medal

ROBERT GREENHILL COCHRANE, M.D., M.R.C.P. Medical Superintendent, Lady Willingdon Leper Settlement, Chingleput, Madras.

Miss REBA CUTHBERT HUNSBERGER, M.D. Lady Doctor-in-Charge, Memorial Hospital for Women and Children, Sialkot City, Punjab.

WILLIAM PATRICK SMYTHE MITCHELL, M.B.E. Lieutenant, Indian Medical Department. Chief Medical Officer, Bastar State.

Mrs. DAISY ELIZABETH MUNRO, M.B.E. Lady Superintendent, Civil Hospital, Karachi, Sind.

JOSEPH LOCKHART DOWNES YULE, M.B., Ch.B. Lieutenant-Colonel, Indian Medical Service. Lately Officer Commanding, Indian Military Hospital, Delhi Cantonments.

Mentions in Dispatches

JOHN CAMPBELL HILL AITAN, M.B., Ch.B. Acting Wing Commander, Auxiliary Air Force.

FRANK CUNNINGHAME COWTAN, M.R.C.S., L.R.C.P. Air Commodore, Royal Air Force.

FREDERICK MITCHELL DUTHIE, M.B., Ch.B. Surgeon Lieutenant-Commander, Royal Navy.

JAMES HILL, M.B., Ch.B., D.P.H. Wing Commander, Royal Air Force.

REGINALD HERBERT KNOWLES, M.D., D.P.H. Group Captain, Royal Air Force.

THOMAS CLOVER LARKWORTHY, M.B., B.S. Acting Surgeon Commander, Royal Naval Volunteer Reserve.

DAVID ANDERSON SMITH, M.B., Ch.B. Flight Lieutenant Auxiliary Air Force.

GEORGE JON WALLEY, B.M., B.Ch. Temporary Surgeon Lieutenant, Royal Naval Volunteer Reserve.

Reports of Societies

HYGIENE IN AIR-RAID SHELTERS

A discussion on "Hygiene in Air-raid Shelters" was held at a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on December 20, Dr. J. ALISON GLOVER presiding.

Dr. P. G. STOCK (Ministry of Health) gave a brief history of recent events. With the onset of the air offensive there was a rush to the tubes. The herd instinct asserted itself in the desire for human companionship, which led to the desertion of the domestic for the communal shelter, with overcrowding of the latter. In many cases the people sought refuge in places which had never been approved as shelters. Until this state of affairs developed, questions relating to shelters had come under the Ministry of Home Security, and medical officers of health had not been expected to interest themselves in the matter. On September 25 the Chief Medical Officer of the Ministry of Health addressed a letter to the medical officers of the metropolitan boroughs asking them to carry out instructions regarding public air-raid shelters in their areas, but by mid-October, for one reason or another, little improvement was apparent in the sanitary conditions. Shortage of materials and labour contributed to the difficulty. Additional medical officers were detailed to visit shelters and co-operate with the public authorities. The fundamental problem was overcrowding, with its attendant evils of defective ventilation and lack of sanitation. Another serious defect in many shelters was dampness due to faulty roofing, flooding of entrances with storm water, or condensation of moisture on the walls. Apart from the deep tube stations lighting was inadequate and badly placed. In many shelters there were no means of artificial heating in cold weather. In many also there was an absence of piped water supply.

The Ministry of Health was not, as some of its ill-informed critics supposed, content to sit back with folded hands after having issued its circulars. Dr. Stock mentioned with high appreciation the personal interest of the Minister, Mr. Malcolm MacDonald. Everything possible was being done to secure the voluntary evacuation of children, of mothers with young children, and of expectant mothers. A ticket system for habitual shelterers had been introduced. A resurvey had been made to discover further shelter accommodation. At the same time it had to be admitted that such a degree of overcrowding still existed as no medical officer of health could regard with equanimity. As to ventilation, early in October a committee was appointed to consider this question, along with that of heating, and efforts were made to improve conditions by installation of fans, opening up of shafts hitherto closed, and other measures. After considerable hesitation it had been decided to put in coal-burning stoves for use in public surface shelters holding fifty persons or more in one compartment. Experiments were being made with electric heating, but the supply question rendered this impracticable in the majority of shelters.

In shelters where the night population was 500 or over the local authorities had been asked to establish medical aid posts, the cost of equipment being the responsibility of the Exchequer. He showed the meeting a plan of a post for a tube station. It consisted of two main apartments: one containing a number of bunks, a cupboard for dressings and medicines, and a dressing table; and the other an isolation space with more bunks. As a rule only cases of minor illness or accident should be retained for the night at the post, serious cases (subject to enemy activity) being removed to hospital. One disease which was considered likely to have increased incidence as a result of shelter conditions was diphtheria, and immunization free of cost was being actively encouraged. The risks of air-borne infection might be reduced by spraying the air. Following upon researches at the National Institute for Medical Research a large-scale trial of antiseptic mist had been made at the Marble Arch tube station, where the mist was introduced into the plenum ventilating system, and as many stations had not this system a further trial in which the sprays producing the mist were operated by compressed air laid in the pipe along the wall of the platform had been made at the station at Bond Street. Much of the hand-spraying at present going on probably did not create a true bactericidal mist. Perhaps the shadow of Lister would note that something like his carbolic spray was again coming into its own. The wearing of masks against droplet infection had been carefully considered, and the principle had been accepted as sound and its practical application was being worked out.

Measures against lice-borne disease were being taken, including certain instructions to shelter marshals, but there was no evidence at present of any special spread of lice in shelters. Delousing stations were being made available, medical officers of health were being asked to consider what improvised measures might be brought into use, and an investigation of a new bactericidal powder was being made. Mosquitos had proved a source of trouble in the tubes, where in the older workings there were large collections of stagnant water in which the mosquitos bred. The species was *Culex molestus*, which, although not a disease-carrier, bit humans viciously. In the tubes, where practically summer temperatures always prevailed, the mosquitos had been obtaining plentiful blood meals from the shelterers and did not go into hibernation. With regard to latrines, he mentioned the installation of hoppered cylinders, in which the pails were emptied and, after closing a valve, the contents of the cylinder were driven up a pipe which discharged into a sewer. Finally he showed a graph of the shelter population of the tubes. The highest peak—186,000—was reached in September; the numbers had now fallen to about 100,000, but the reduction was mainly in the tube stations patronized by the more prosperous part of the sheltering community.

Dr. J. ALISON GLOVER, from the chair, said that the first and hardest fight was against overcrowding, which facilitated the transmission of every infectious and contagious disease. In the broadest sense its abatement was mainly a matter of administration. Public Enemy No. 2 was damp, which was of three kinds: percolation from sides, roof, and floor; condensation; and, most important of all, the respiratory miasma which overhung all crowded assemblies. There was much, however, to be thankful for. The *Blitz* started early in September, four months before the beginning of the epidemic season, which gave time not only for material improvement in the shelters but also for acclimatization to shelter conditions by the public and the mutual exchange of nasopharyngeal organisms with, it was to be hoped, some degree of non-specific immunity in the shelter population. In the last week for which he had figures the notifications for diphtheria and scarlet fever, though numbering more than in the corresponding week of 1939, when they were remarkably low, were still less numerous

than in 1938. Pneumonia notifications were at about the usual level. Casualties had been extraordinarily small in proportion to the weight of the air attack, and, although the work of the R.A.F. and the defence services must have the major credit, the fact that the shelters had stood up to splinters and blast much better than many anticipated must be taken into account.

The City of London

Dr. C. F. WITTI (medical officer, City of London) said that the majority of shelterers who came into the City nightly for refuge congregated in four deep tube stations. But there were a number of other shelters capable of accommodating over 500, and about one hundred in the "under 500" class. It was easy to talk about dispersal, but the difficulty of persuading people to leave an overcrowded deep tube station or tunnel for a more comfortable and airy basement had to be experienced. He had found surface shelters practically unused at night. It was a question of balancing the value of sleep and freedom from fear against the ill effects of vitiated air and risk of infection in crowded shelters. Compulsory evacuation of children was not practicable, and refusal to accept evacuation was seldom, if ever, due to the indifference of parents. At the same time, if a child's health was definitely suffering as a result of shelter life or endangered by the prevalence of epidemic disease in a shelter it should be possible to insist on evacuation or at least on transference to another shelter which, though not capable of standing up to a direct hit by a high-explosive bomb, was, perhaps for that very reason, more hygienic. If the shelter doctor could certify that the health of a child was obviously suffering, then removal might be enforced, for public sympathy would at once be on the side of the authorities. What about the disposal of cases of German measles and mumps occurring in the shelters? It was useless to suggest that these should be treated at home. If the isolation hospitals could not take them they must be kept in the medical aid posts and adjoining sick bays or transferred to shelters reserved for cases of minor illness. He was strongly in favour of the latter course.

It was difficult to believe that aerosols would be of much value for the disinfection of the air in the enormous spaces with which it was necessary to deal. The barrier method might be practicable and useful if they could concentrate in a certain part of the shelter cases liable to disseminate infection. It was useless to expect the installation everywhere of efficient mechanical ventilation; the best possible must be done by keeping open entrances and emergency exits and the use of electric fans. The heating of shelters might or might not be necessary. Deep underground shelters were usually too hot and humid. In one tunnel the temperature was never less than 70° F. at night. Smaller shelters with concrete floors and brick walls were usually too cold, yet on account of deficient ventilation heating could not be introduced. The shelterers must make adjustments by having more clothing or bedding.

The disposal of excreta was an enormous task. In the City, in the expectation that the shelterers would be mainly persons employed in offices or shops, an excellent type of chemical closet was installed in the proportion of one closet to every twenty-five persons in the day capacity. As the night capacity was from one-half to one-third of the day capacity there was an ample supply of conveniences, but he had been appalled at the way in which they had been abused by a certain section of the population. He had come to the conclusion that anything but the simplest appliance—a pail straddled by a wooden frame—was a waste of money, and in the pail he would have only a solution of some coal-tar disinfectant as a deodorant. He understood that the tube shelters were trying to work to a figure of one convenience for every seventy-five shelterers, but he doubted whether they would attain this. In the City it had been arranged to have the large public conveniences which were in close proximity to the tube stations open free all night long, but the results had been disappointing; the shelterers either would not take the trouble or were afraid to make the short journey outside. The only thing to do in the tube stations was to arrange for the closets to be kept under observation and emptied as necessary during the night. The installation of the pneumatic ejector systems would reduce the labour of the cleansing department.

There was no serious lice infestation as yet in the City, but he was afraid this might not continue to be the case. For homeless shelterers some opportunity for personal ablution must be provided, but for the washing of clothing and bedding shelterers must be referred to the districts in which their homes were situated. Bunks would have to be dealt with *in situ* by the application of liquid insecticides. In conclusion he begged critics of medical officers of health to realize the difficulty of the conditions under which they had been working.

General Discussion

Dr. S. DAVIDSON thought it a too optimistic view to expect that major epidemics would be escaped unless much more care was taken than at present. From his observation in the north-west of London brick shelters were almost unoccupied; people thought there was more protection in a deep shelter, and took the risk of contracting disease. It was also well to remember that eight or ten people in an Anderson shelter or fifty or sixty in a brick shelter were just as much overcrowded as 2,000 or 3,000 on a tube platform. The medical profession ought to concern itself with the provision of some form of bomb-proof shelter, possibly on the Haldane model (*British Medical Journal*, November 16, page 678). Dr. SINCLAIR-LOUTIT said that the fouling of lavatory accommodation was largely by young children, who found the adult-size chemical closet too big a problem. The provision of closets in the proportion of 1 in 25 if a fair proportion were small ones should make a great difference. As to the problem of the people who were ill but not in hospital, in a community of 50,000 there were roughly 1,400 cases of notifiable disease, of which only about 600 were sent to hospital. The population of the area he had in mind was now reduced to 38,000, but it still left a large number of persons with notifiable disease who had to be dealt with in their own homes or in the shelters. Among the same community there were about 350 young adults with a history of tuberculosis. Some plan ought to be found for the allocation of shelter space to these cases. Dr. UNDERWOOD (West Ham) did not believe that this policy of isolating tuberculous cases would meet with success. It would have to meet the psychological objection that people would refuse to declare themselves tuberculous by going into the special shelters. As in the City of London, so in his own borough of West Ham, there did not appear to be any evidence as yet of infestation in the shelters. Dr. A. BENJAMIN pleaded for more co-ordination between the engineering and medical departments of the local authorities. He related a case in which, in a shelter with seating accommodation for 180 people, exactly that number of bunks had been put in, resulting in overcrowding. The safe number was 132, but there was extraordinary delay in getting the surplus bunks removed. Dr. W. H. BRADLEY (Ministry of Health) described some work on the design of masks to prevent danger from droplet infection. The main difficulties in introducing light muslin masks in the shelters were the shyness of those whom it was hoped would use them, the absence of aesthetic appeal, the general indifference in the absence of any heavy infection, and the fact that the masks soon became moist and uncomfortable. It was fully realized that masks could be of great use in preventing direct projectile infection, but there were a number of practical difficulties in the way.

The Chairman of the Government Committee

LORD HORDER said that he had always regarded the shelter problem as an emergency one, rather like an acute if not fulminating disease. There would never be an ideal shelter. The problem had to be dealt with in opportunist fashion, and the difficulties removed so far as possible when they could not be got rid of entirely. From his experience of the framing of recommendations he felt strongly that these should be couched in positive, not negative, terms, also that they should be practicable, and, finally, that the psychological effect should be kept in mind. One must not be afraid of making suggestions which to the scientific ear might sound rather trivial. He thought it not incompatible for two policies to be pursued side by side; one of these was a long-term policy, in regard to which the refrain must be "Unload! Unload!" But it took a long time to "unload" these shelters, and therefore a short-term policy was also needed if the situation was

to be saved before the height of incidence of epidemic disease was upon us. He did not agree with one speaker who had suggested that doctors ought to concern themselves with the safety aspect of shelter policy—that is, safety against enemy action—but he reminded the audience that so far as fatal casualties were concerned it was a question of half-and-half anyway as between above-ground and under-ground shelters, and it was as well to bear in mind that some of the deep shelters were actually under military objectives, and for this reason the people might be safer on the surface.

There were some compensations in this "hideous emergency which has been thrust upon us." The research which had been stimulated would undoubtedly lead to valuable and permanent contributions to preventive medicine. It had also opened up a field for health education second to none in his experience. The shelterers were ready to listen to the advice given them and could be trusted to a large extent to carry out the instructions given by medical officers of health. Lord Horder added that he trembled every time he signed the final form of a recommendation, wondering what would be the reaction among his colleagues, and he was amazed at his "luck" so far in that his attention had not been drawn to any very obvious errors.

Dr. STOCK, in replying on the discussion, said that when school shelters were used as public shelters during the night very special care should be taken over the cleansing. The difficulty of cleansing bedding and clothing might be solved by mobile units. Further recommendations of the Horder Committee would be issued as a White Paper, and he thought would include advice on the wearing of masks, as to which valuable co-operation had been given by workers at the National Institute for Medical Research. One provision about bunking was that there must be at least two feet between the rows of bunks. Where, for some reason, this was impossible a partition had been devised for use between the head portions of adjacent bunks. He concluded by saying that there was one gleam of hope in the situation—namely, that the constitution of the "herd" in the public shelter might help to avert the disasters of the old epidemics. The "herd" was of much the same constitution as the ordinary population of London, but with a large number of the more susceptible members—namely, children—removed.

Correspondence

Unification of Shelter Control

SIR,—Your correspondent Dr. A. S. Jarman (December 21, p. 880) raises a point of central importance when he says that it is time we, as doctors, faced our social responsibilities. But the rest of his letter appears to be based on a misconception of the present situation. The shelter problem of London divides itself into two parts. The first part is that of providing reasonable safety from disease (as well as bombs) for that part of the population of this and other big cities who either live in or are able to reach districts where big buildings or such public works as tubes are available for use as shelters. To these, doctors and nurses have in many cases been appointed, bunks and canteen facilities provided, and to these shelters apply those improvements of which, in the B.B.C. and the Press, we have heard so much.

Quite different, however, is the problem presented by those areas of London and other cities where no such buildings exist, and where the district is composed of small dwellings, wharves, etc., incapable of providing large shelters. To talk of shelter doctors in relation to these is an absurdity, as no such shelters exist, and the fleeting moments of the visits of doctors and nurses, when they occur, can do no more than deal, and that unsatisfactorily, with pressing emergencies. In these areas the population is compelled to save itself as best it can with assistance from none but voluntary bodies, since nothing else is forthcoming. If it is argued that the central Government has delegated sufficient powers to local authorities to deal with all emergencies, the answer is that the multiplicity of these authorities, the apathy of many, and the extreme overwork of others almost wholly negate these powers. The problem is much greater than that of shelter diseases; it is that of securing the elementary necessities of living, hygiene, and sanitation, for an immense mass of our fellow citizens.

The areas and the people who inhabit them are the front line of the war, and as an army cannot act without a general and as the work of excellent relief units in the past has been ruined by an attempt to run them by committees, so the creation and organization of the measures to deal with this situation demand a directing mind with adequate resources and full authority to act. To urge arguments against this proposal because the term "dictator" has been used is to quibble about words. As I attempted to point out in a previous letter, the whole structure of local administration and the education of its officers is aimed at preventing the possibility of swift and co-ordinated action, and it is exactly that which the whole of Britain now urgently demands should happen in London. If the situation in the poorer areas of London and of the other bombed cities is to be met with energetic unified action, a single head who tackles the problem as a whole and acts directly through obstacles to the central objective is essential.

As a profession we are responsible to the people for their health. Is it not time that we roused ourselves, and as a body saw to it either that the central Government makes use of those powers we have delegated to it, or that by other and more direct means this objective is gained? We have in the British Medical Association the necessary instrument to collect information, disseminate it, and see that pressure is brought to bear on the authorities. Let us then take responsibility for our part of the war and "go to it."—I am, etc.,

London, W.1, Dec. 26. MARGARET LOWENFELD.

SIR,—Nearly every day for many years my work has taken me to the East End of London. I have therefore read with keen attention what the official representatives of the medical profession have permitted to appear about the shelter problem. It seems to me that the medical profession, whose individual devotion is unquestionable, has in one respect failed collectively to do its duty in the present crisis.

In addition to the natural obligations of community, there are other and forceful reasons why we, as a profession, should rise to this occasion, which is unique only in its urgency. The people living in industrial areas, particularly the East End of London, who always face circumstances with courage and heroism, have for the moment become an integral part of the front-line defences of this country. They are not just a group living within a national front; they are an integral part of it. It is for them that government exists. The Germans, who, since they planned it, have clearly visualized the nature of this war, know that civilian morale is a military objective. Now the medical profession who work among the poor know the appalling conditions which have always existed and which are intensified by the *Blitzkrieg*. Human beings deserving of comfort and security have as their constant lot overcrowding and anxiety. Now they live in conditions which approximate to the filth of the Middle Ages. This is particularly true of the smaller shelters which have not yet been brought under co-ordinated control. Such conditions, if perpetuated, must undermine that integration of character which we call morale.

It is therefore the natural duty of the medical profession to investigate and to make known the facts of the situation against whatever official opposition exists. I suggest that we should appoint a body whose business it is to amass information and to make it known to the general public together with its recommendations. Our position is happily still such that no Government could exist for long which ignored a report based, not on sectional and professional interests, but on the objective necessities of a social situation.

A large part of the solution of these problems depends on powers of control. In this connexion it is necessary to point out to some of your correspondents that there is a difference between a director appointed by a democracy and a dictator in the totalitarian sense. One is armed with plenary powers to carry out the intelligently conceived plans of a community, the other obtains power for its own sake by giving

a social sanction to the free expression of those wilder fantasies and deeper prejudices which it has been the business of nearly 2,000 years of civilization to tame and turn to useful social ends.—I am, etc.,

London, W.1, Dec. 26. H. W. S. WRIGHT.

Control of Lice in Shelters

SIR,—In your excellent leading article on "Unification of Shelter Control" (December 21, p. 873) you rightly call attention to the likelihood of the swift spread of lice-borne disease and indicate some of the measures to be adopted to prevent it. You omit, however, to mention the most important measure for preventing infestation—namely, the necessity for changing the clothes, especially the under-garments, at night and the regular washing of the underclothes. In peacetime body lice are rarely seen and are then found only in tramps and the inhabitants of common lodging-houses, who rarely change their underclothes. In the last war infestation with lice was high when the troops were compelled to wear their clothing for long periods at a time, but rapidly fell when they were living under more favourable conditions. Body lice live and breed in the underclothing, and, though nits may sometimes be found on the body hairs, this only occurs in heavily infested individuals. If the clothes are worn continuously temperature conditions are favourable for the rapid breeding of lice. If, on the other hand, the clothes are allowed to get cold for several hours each night, breeding is seriously interfered with and may even stop altogether. Washing of the garments further tends to reduce the chances of infestation. Cotton garments are as a matter of course boiled, and this will kill off all lice and nits. Unfortunately woollen garments cannot be boiled, but washing will mechanically remove the lice and most of the nits.

I venture to suggest that the vital importance of changing their clothes at night and of the regular washing of their garments should be impressed on all those who use shelters. The prevention of infestation is primarily a matter for each member of the community and not for the public authorities, and it is important that the public should be informed of this without delay and in no uncertain manner. On the public authorities rests the responsibility of dealing with already infested persons and of providing the necessary clothing and washing arrangements for those who have lost their homes.—I am, etc.,

London, W.1, Dec. 23. A. M. H. GRAY.

Removal of Nits

SIR,—It is stated in a note attached to the memorandum dealing with drugs used in dermatological practice drawn up by the Therapeutic Requirements Committee of the Medical Research Council (December 7, p. 795) that ". . . the nits can then be removed by a fine comb after the application of vinegar or dilute acetic acid." On the other hand, in an article entitled "The Control of Lice," by Prof. P. A. Buxton (November 2, p. 603), we read: "The legend that vinegar or acetic acid loosens nits and enables them to be combed out was disproved twenty-five years ago: it dies hard."

It seems a pity that a memorandum containing recommendations which are of interest to the majority of doctors should help to keep alive this legend.—I am, etc.,

Hornchurch, Essex, Dec. 27. PATRICK X. O'DWYER.

Air-raid Casualty Services

SIR,—Having been a member of both a first-aid post and a stretcher party since September, 1939, I was extremely interested in the editorial "Air-raid Casualties" (November 23, p. 716) and am sorry that it has not evoked more comment.

The article contains references to the work of the stretcher parties and of their difficulties in exercising proper judgment in the classification of casualties according to immediate need for first-aid treatment and priority of removal to hospital or F.A.P. under the adverse conditions of darkness, bombs, and the necessity for speed. Such references are in my experience (and that of my colleagues) quite true. Stretcher parties for the most part are quite unable to carry out the "pre-blitz" plans assigned to them, in which it was expected that they would be able to sort out, treat, and despatch casualties in a certain prescribed manner so that every injured person might be sent to the place at which the appropriate treatment necessary could be given at the earliest possible moment. As you state, the ghastly appearance of many, yet whose injuries are but minor, does suggest a hospital case, whereas treatment could be more conveniently given at a first-aid post. As a result of the disability to differentiate, almost all cases are sent straight to hospital, with little or no attempt at classification or priority of removal, while the first-aid posts and mobile units are used only to a very minor extent.

The need for accuracy in the sorting of cases according to immediate need for first-aid treatment and priority of removal, difficult though it is, is so important for the injured and the smooth working of the plans for their treatment that some steps must surely be taken to remedy the present position. A much greater use should be made of the medical profession; a doctor ought to be present at each incident if at all possible; as it is, I believe that many practitioners attend voluntarily and unofficially. The mobile units could also be used more frequently if their number were increased, the individual personnel of each reduced, and their equipment simplified. They could be sent out to each incident to return if not wanted or to remain and act as a classification centre if needed.

Even then the problem would not be solved, and the success of the present plans will still remain in large measure with the stretcher parties, on whom the main burden will still rest. In my opinion it is not possible to expect the stretcher parties to do their work efficiently unless more care is taken in the selection of personnel and their training is adequate to overcome the difficulties under which they are called to exercise their judgment in dealing with all types of injuries. Not the least of the errors of local A.R.P. organization has been the herding together of all types and conditions of men into stretcher parties without any real attempt at selection in accordance with ability, giving them eight lectures in first aid (in most cases from the British Red Cross or St. John Ambulance manuals, which have little relation to air-raid casualties), and then expecting that they can exercise a judgment that many medical men would hesitate to give under the conditions encountered.

I am sure that a much greater degree of efficiency, and a much closer approach to the intentions of those who planned the work of stretcher parties, could be obtained by a carefully planned selection of personnel into two sections—that is, stretcher bearers and first-aid workers, with special appropriate training for each based upon the experience of the past few months.

The first-aid section, chosen for their ability to make use, under adverse circumstances, of special tuition, would be trained to exercise to a much greater degree than at present possible that judgment so essential in rendering the most appropriate form of first aid, the initiation of anti-shock treatment, and in determining the order of removal and proper destination of casualties. Freed from the need of having to do any transporting, which would be done by the bearers, they would have more time to do the important work and to do that more effectively and speedily than is possible by less-trained workers, especially if they can work in co-operation with a doctor. It has to be remembered that, even if a doctor is present, his work is seriously handicapped unless the stretcher parties are highly trained, for he must rely to a great extent upon their judgment in either bringing the injured to him or indicating the position of those who need his services most; and any errors may lead to his attending to certain cases while someone else is bleeding to death a few yards away.

The stretcher bearers should be specially equipped and trained in the removal of all types of injury from wrecked houses and over debris, and I must emphasize that training in this respect still leaves much to be desired (*vide* many letters on the removal of the injured and shock), probably due to the fairly constant change of personnel owing to call-up for military service. There are plenty of opportunities for lifelike training among air-raid ruins. There is an appalling waste of good material in the stretcher parties as at present organized. Almost any doctor attached to or engaged in lecturing to them will bear out this statement that there are large numbers of the personnel who could, with suitable train-

ing, become extremely valuable assets in the difficult and responsible tasks of the stretcher parties, and I feel sure that the answer to many of the points raised in your article will, in part, be met by the suggestion put forward. No one would dare to question the courage or resourcefulness of the stretcher parties, but I can assure you that not many of them are satisfied with the present position, in which the most and best that they can do is to hurry all casualties off to hospital. Most of them would welcome being placed into the category for which they were best suited and given a training that would make them more efficient and able to render the assistance that they want to be capable of giving.

I enclose my name and address, not for publication, in case this letter be misunderstood and taken to be a criticism of the Borough Council that employs me.—I am, etc.,

Dec. 23. F.A.P. AND S.P.

London Air Raids

SIR,—There has been such an interesting response, both in your columns and in personal letters, to my letter (November 9, p. 643), that I am tempted into print again. My experience has been in an outer borough in the London region. We have in this area few factories and few high buildings: we have received probably between 60% and 80% of London's average damage in terms of tons of bombs per square mile.

Most of the control room duties of the medical officer of health can safely be delegated to a well-trained lay deputy, provided the M.O.H. can be contacted within a few minutes (which is possible via a wardens' post system wherever in the area he may go). It therefore seems proper for the medical officer to go out to any incident with numerous or trapped casualties without waiting to be sent for. He is likely to be valuable as a senior officer or as a doctor, or both. After bombs have fallen it should often be possible to decide soon and reasonably accurately which incident is more suitable for the mobile unit (or for the unit doctor with one or two assistants) and which for the M.O.H. In our own case geography often gives the answer. The control centre and mobile unit are near opposite ends of an awkwardly-shaped administrative area.

Several correspondents visualized the exact difficulty of giving morphine injections and had probably experienced it. It is often essential to prepare and give an injection in a really awkward position with one hand. The tubunic ampoule by Roche is an elegant and adequate answer. Alternatively a 1-c.cm. syringe with its piston ring intact (and therefore no tendency to empty under the force of gravity) can be stowed temporarily in one of the narrow cylindrical tins commonly used for diphtheria swabs, and put in a buttoned pocket.

One hears that in certain areas stretcher party men "wait on the pavement for their casualties" and will undertake no other activities of any sort. As regards air-raid action, I am convinced that the stretcher party leader, like the doctor, should be encouraged to reached trapped casualties at the first moment he can be of any use without dangerously obstructing the rescue parties. In the absence of raids and even during daytime "alerts" we have now received an official blessing for a most desirable practice—the assistance by up to about 50% of the stretcher party strength in clearance and salvage work. Most of the men are glad to do this once they realize its value, and I think the service would be improved if this work were put on a compulsory basis and grousers, if any, dismissed. One of the main difficulties in maintaining morale has been and always will be the provision of sufficient worth-while "fatigues." An unnecessarily large amount of floor scrubbing is better than everlasting ping-pong and darts, but it is a poor substitute for a proper day's work.

So far as I can ascertain, certain authorities accept and others refuse altogether the conscientious objectors sent to them by the tribunals. As tolerance is one of the things we happen to be fighting for, they are accepted here if they live in the area and vacancies exist. I am glad to be able to say that this has not led to difficulties with other personnel.

A large number of civil defence volunteers, full- and part-time, were persuaded, or ordered, rather against their own wishes, not to join the Home Guard on the ground that they could not properly undertake both responsibilities. They now look with envious eyes at the warm overcoats, boots, etc., of the H.G. (and, incidentally, the A.F.S.), and wonder why they are expected to undertake their own onerous and often dirty duties in their own clothing, or, at best, in an aged boiler suit and, with luck, a pair of gum-boots.

The following is quoted merely as one of many amusing but rather appalling examples of the results of divided control. We received verbal instructions many months ago that in stretcher party depots there ought to be an individual issue of three blankets per man. Recently I was able to obtain documentary backing for demanding this reasonable issue (but not, needless to say, the blankets). I have also received an instruction that the proper issue of blankets for a first-aid post is three blankets per bed for 75% of personnel on duty—that is, in our case 37½% of the proper issue per man for a depot. It is, or rather ought to be, surprising that the Ministry of Health is the more conservative in a matter of this kind.—I am, etc.,

Dec. 23. E. B. GROGONO.

The Mobile Unit in Action

SIR,—I have read with great interest Dr. J. J. Cremin's letter on the mobile unit (December 14, p. 847), and I endorse heartily his views, which I have held since the inception of the mobile unit. Quoting from the Ministry's Circular 1789: "The intention in using mobile units is partly to enable a complete first-aid medical unit to proceed to the actual site, there to set up, either in the shelter of any convenient building, or even, if the weather is fine, in the open air, and partly to reinforce the fixed aid posts. It is not proposed that first aid should be carried out inside these vehicles." It is exactly in these respects that the mobile unit will often fail in its object, as it failed in Dr. Cremin's case.

Trueta, in an address to the Royal Society of Medicine (*Proc. roy. Soc. Med.*, 1939, **33**, No. 1) stated: "Sometimes hindrance is due to defects in the organization itself, as happened in Barcelona when emergency treatment posts were set up inside ambulances." Again "... after the tragic experience of Barcelona I maintain that the immediate intervention of the surgeon in hospital is the only useful form of first aid other than the application of a tourniquet to the limb which bleeds excessively, and this can be applied by the ambulance man. The application of a splint, bandage, or other form of first aid has been shown in my city not only to be useless but actually harmful, because it always delays the surgical treatment."

Personally I have seen the mobile unit at practice in co-operation with the various A.R.P. services in mock raids, and I am of the opinion that they are a waste of time and personnel. I feel that it would be far better to employ a larger personnel of trained stretcher-bearers, who could work swiftly in co-operation with an adequate first-aid party, rapidly transferring cases to a fleet of speedy ambulances, which would proceed forthwith to hospital. This active body of first-aid workers under the direction of their squad leaders would be responsible to one medical officer and nurse, who, armed with morphine, should have reached the scene of activity in a small fast car, being summoned from the control room at the earliest possible moment.

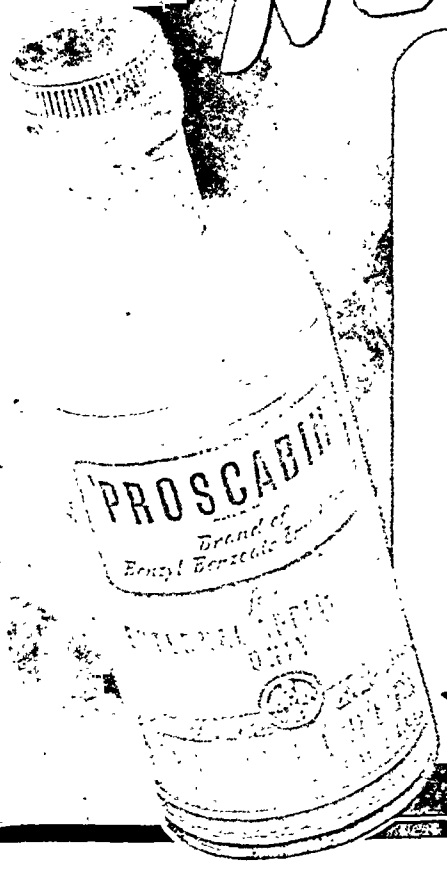
Finally, I agree that it is reprehensible for "key" medical and nursing personnel to take part in the mobile unit. I know of one hospital where the medical officer in charge would be obliged to go out with the mobile unit, attend and supervise casualties, return to hospital to supervise admissions, etc., and then operate, being one of the few surgeons available in that district.—I am, etc.,

Barnsley, Dec. 18. ISAAC ROSE.

SIR,—A letter from Dr. J. J. Cremin (December 14, p. 847) expresses exactly the opinion we have come to from our experiences in this city. On the occasion of a recent air raid instructions were given from A.R.P. Main Control for one of our mobile posts to proceed to the scene of an occurrence where we were led to presume the presence of a considerable number of casualties. However, when the mobile post reached the scene the few casualties that had occurred were already cleared away to hospital. The second mobile post was sent out to the scene of another occurrence where one of our aiding

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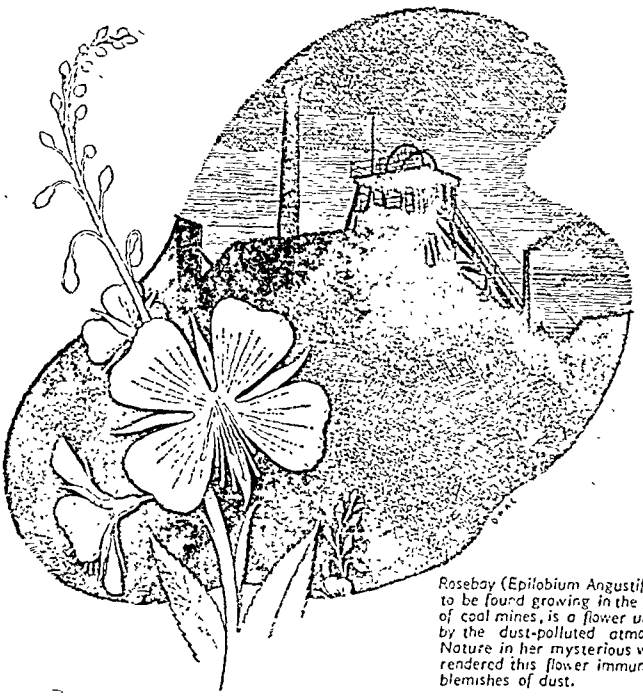
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depots had been destroyed. Certainly there was no lack of casualties in this case, but the light from burning buildings proved, as it so often does, a target for further bombs, with the result that the mobile post was burned out and though there were no casualties among the personnel the unit was rendered useless. If they had been stationed at a fixed post I am of the opinion that their services would have been more valuable.

As a result of our experience we have decided not to replace the burned-out mobile post, but to disperse the personnel to strengthen those fixed posts where their presence is most needed. The mobile post is doubtless most valuable in a county to visit isolated villages, but it is difficult to envisage any situation in a city where it can prove of more value than the ordinary fixed post.—I am, etc.,

Leicester, Dec. 18. F. K. MACDONALD, Medical Officer of Health

Epidemic Influenza

SIR,—Dr. William Hartston (December 21, p. 878) signifies with quotation marks a reminiscence of something he has heard me say, which was, probably, the epigram that when we don't know what we are talking about and don't care whether what we say is true or not we are talking pure mathematics. I dare say I explained what it meant. The great mathematician who originated it meant that starting from *any* axioms and postulates not self-contradictory, the task of the mathematical logician was to deduce consequences which were *consistent*; whether the postulates were true and the consequences had any "real" meaning was beside the mark. Why Dr. Hartston thinks this is a sneer at mathematics or what it has to do with forecasting epidemics, Heaven only knows.—I am, etc.,

Loughton, Dec. 23. MAJOR GREENWOOD

Convulsion Therapy in the Out-patient Department

SIR,—Dr. E. Cunningham Dax (December 21, p. 878) tells us that it was with foreboding that he anticipated the use of electrical convulsant therapy under out-patient conditions. I too may reveal the fact that I foresaw the kind of criticism that an account of the treatment would call forth; and, moreover, I prophesied that it would come from an experienced institutional psychiatrist.

Dr. Dax's letter, although it appears to deal solely with the question of electrical convulsant therapy, in reality reveals the wide gulf which, alas!, still divides psychiatry as it is understood and practised in the teaching hospital and consulting-room and institutional (asylum) psychiatry. The institutional psychiatrist, in the course of time, is apt to forget what the symptomatology and reaction-forms of really early mental disorder are like, and to think in terms of types rather than of individuals (Dr. Dax's own hospital caters for over 2,300 patients, I believe). By the time that the patient has been compelled to enter a mental hospital either as a voluntary or as a certified patient, his mental disorder is already far advanced; and within a few weeks of the patient's admission the psychiatric picture has changed: something has been added to his original mental disorder—the "asylum psychosis." Further, I believe that the consultant psychiatrist sees *in the psychiatric department of a general hospital and* in his consulting-room many patients whose mental disorders are even less advanced than is the case with those who find their way to the out-patient clinics associated with many of the more progressive mental hospitals.

The majority of cases of *early* mental disorder can be, should be, and in point of fact are, treated in out-patient clinics, consulting-rooms, and private nursing homes; any form of treatment which shows promise of being able to "stop the rot" or alleviate symptoms, thus reducing the mental hospital population, should be given a fair trial under out-patient conditions. Consider, for example, recurrent endogenous melancholia of the manic-depressive type: my mental hospital colleagues tell me that it is a relatively rare disorder, whereas I see several fresh cases a week. The reason is that only a small proportion find their way into the mental hospitals. Every such patient is a suicidal risk, admittedly; but it is a risk that every consultant psychiatrist must be prepared to take in the appropriate circumstances. I myself have been fortunate enough never to have incurred the loss by suicide of a depressive patient under my care, either in his own home or in a nursing home.

Dr. Dax's statement—"It seems unlikely that as good results will be given by treatment in the environment where the patient's illness began as when the patient is separated from his home surroundings"—is far too sweeping. In many cases of mild or early psychosis the individual attention which can be given by devoted relatives to the patient under the guidance of the consultant psychiatrist is infinitely preferable to the impersonal handling of a patient by mental nurses, trained or under training, in the 2,000-bed mental hospital.

Now to deal *seriatim* with some more points raised by Dr. Dax:

1. If the patients for treatment by electrical convulsion therapy under out-patient conditions are selected with care and skill, and their reactions studied week by week, none of the accidents mentioned in the second paragraph of Drs. Dax's letter need occur.

2. "Half to one hour is too short a time for rest following a fit": The fact remains that nearly all the patients so far treated have rested or slept for half an hour or so, and have then expressed themselves as ready and anxious to return home. The majority sleep unusually well the night following *the fit. In my experience the same is true of many cases of* idiopathic epilepsy. I agree that the same technique cannot apply in the case of chemically induced convulsions.

3. I cannot agree that the retention of clothing (with the exception, of course, of tight corsets) in any way restricts free movement. The amount of restraint employed in my department is merely sufficient to prevent the patient from falling off the couch or from injuring himself. It is an interesting fact that with the electrical apparatus the convulsions are very rarely so violent as those produced with cardiazol. So far, none of my patients has sustained a fracture or dislocation. If Dr. Dax includes under fractures those symptomless cracks in the bodies of vertebrae which are only discoverable by *x* rays, this last statement may be challenged: for I have not looked for them. I think it is mischievous that such fractures should be considered under the heading of "risks" when a patient's mental health is in question.

4. "The general hospital is not the place for even mild, uncomplicated mental illness." I cannot concur. I look forward to the time when every teaching hospital will have its properly equipped and adequately staffed psychopathic wards. Such is the laudable intention of St. George's Hospital, for instance, when it moves into new premises.

Finally, I should like to assure Dr. Dax that "the patient's welfare is the only consideration"—so much so that I am doing my utmost to save as many patients as possible from our overcrowded under-staffed wartime mental hospitals, even at the risk of a few psychiatric "accidents" of a kind which so far fortunately have not occurred.—I am, etc.,

London, W.1, Dec. 21. E. B. STRAUSS.

Haemorrhagic States with Snake Venom and Lecithin

SIR,—We have read with much interest the paper by Prof. L. J. Witts and Miss Felicity C. G. Hobson (December 21, p. 862). We have ourselves been carrying out experiments on closely related lines, the results of which are at present being prepared for publication. It is hoped that a full account of the work will be published in the *Journal*. Our results confirm the observation of Witts and Hobson that lecithin potentiates the action of Russell viper venom in the Quick test for *prothrombin. When used with brain extract lecithin produces* only a very slight decrease in the coagulation time. We have also been unable to determine any important accelerating effect in conditions of marked prothrombin deficiency. Our attention was originally directed to this problem by the observation of one of us (A. C.) that the presence of slight haemolysis in the plasma was associated with a decreased coagulation time as determined by Quick's method. The important point brought out by our own work is that the effect of slight haemolysis of the blood is more marked than the addition of lecithin. It is evidently not due to the presence of

haemoglobin in the plasma, since the addition of solutions of "crystalline haemoglobin" has no effect. We consider that it may possibly be explained by the liberation of lecithin from the envelopes of ruptured erythrocytes. Since the effect of even slight haemolysis may be very marked it is obviously of great importance that specimens of blood for prothrombin determinations shall be absolutely free from haemolysis.—We are, etc.,

Clinical Laboratories, Royal Infirmary, Edinburgh, Dec. 24. ANDREW CROSBIE. HAROLD SCARBOROUGH.

Recurrent Peptic Perforation

SIR,—The interesting account of a case of "recurrent peptic perforation" by Mr. Gavin Milroy (December 21, p. 868) brings to mind a similar experience of my own which occurred recently.

A man aged 53, was twice admitted to hospital as an emergency case and twice operated on for a perforated gastric ulcer. This happened within the space of one year and ten months. At the first operation the ulcer found was pre-pyloric in position and the suturing of the perforation so stenosed the lumen of the viscus that, contrary to my usual practice, I would have performed a gastro-enterostomy as well had the patient's general condition allowed of it. In the end things turned out satisfactorily without this additional procedure, and an *x*-ray report one month after operation stated "that there was no obstruction or delay in the passage of the meal into the jejunum." I had, nevertheless, intended to watch his further progress.

At the second operation a small perforation of a new ulcer high up along the lesser curvature was found. This was sutured with ease and the peritoneum drained as before. In both instances there was a short history of indigestion of seven days only before the perforations occurred. The patient was operated on twelve hours and two hours respectively after the onset, and on both occasions convalescence was uneventful. The patient was the sort of man not to seek medical aid until seriously ill, and despite advice did not return after his first experience. A further point of interest is that his brother died of "perforated duodenal ulcer" twelve months before the date of the patient's first attack.—I am, etc.,

London, E.3, Dec. 26. J. R. M. WHIGHAM.

Euthanasia

SIR,—Dr. Killick Millard (December 21, p. 881) is naturally pleased to announce the number of persons whom he has persuaded to support his campaign for the legislative sanction of voluntary euthanasia. Presented from the sentimental aspect his case has a quality of sympathetic appeal. Adhesion to it, however, has little value unless consideration has been given to the social and professional objections that have been advanced by representative speakers on behalf of the medical profession, and to state these objections is not the affair of Dr. Millard's organization. In these circumstances the mere quotation of numbers of adherents may possess some advertising value but is little likely to impress opinion within the medical profession.

Should the State authorize the practice of voluntary euthanasia it must needs appoint executive officers to administer the fatal draught. Doctors, whose purpose it is not to destroy life but to relieve suffering, may reasonably refuse to have this task imposed on them. I suggest that Dr. Millard's supporters, as a test of their convictions, might appropriately be asked whether they are willing personally to volunteer for this painful service. He is but a feeble disciple whose record is one of faith without works.—I am, etc.,

Hove, Dec. 23. C. O. HAWTHORNE.

Some Points about Stretchers

SIR,—I notice with concern that District Councils tend to use A.R.P. fitments even in their "non-A.R.P." ambulances. This matter needs serious consideration.

The discomfort of the A.R.P. stretcher may be remedied by covering it with a thick mattress of porous rubber, and the sharp upward projections of the stretcher carrier fitments, so apt to cause injury, can be cut down or encased in wood.

Other troubles, however, must arise, since the time-honoured comfortable canvas stretchers will usually not fit the A.R.P. stretcher carrier guides. The Army stretcher (6 feet between runners) will go on only if the stretcher carrier is fitted sufficiently far aft in the ambulance. The St. John stretcher, with its narrower width, 22 inches or less between runners, will fall through if placed on the guides, and this same serious criticism applies in the case of railway ambulance stretchers (L.M.S. was tried) and the police stretcher. Wider angle-iron guides would be required to take these stretchers, and it would be well to be prepared for what might be an awkward situation.

Is it sound policy, however, to throw over the product of generations of stretcher experience for the sake of a very hypothetical facility in gas decontamination? For the latter two years of the last war mustard gas shelling was practically an everyday experience to regimental medical officers. I cannot recollect that decontamination of stretchers was other than a minor preoccupation.—I am, etc.,

Denbigh, Dec. 22. D. G. DUFF.

Treatment of Burns

SIR,—Surely what we want to teach the public and first-aid workers in regard to the treatment of burns is something simple, easily obtained and easily applied, and efficacious. The controversy raging at present is only adding to confusion. Tannic acid and/or silver nitrate, the treatment *par excellence*, is not only difficult to apply in ordinary circumstances, but also dangerous in unskilled hands. In hospital it is the ideal treatment, but in a back kitchen or even in a first-aid post with a rush of casualties the detail calls for time, experience, and special facilities.

My experience has taught me to follow a strict course:

(1) Treat the shock, no matter how slight the injury may seem. For first aiders and others in that category this is best done by: (*a*) Laying the patient flat. (*b*) Application of warmth (blankets, hot-water bottles, etc). (*c*) Fluids *ad lib.*, even if it is ordinary water (lukewarm). No attempt is to be made to deal with the burn until the general condition has improved. The doctor must give morphine, or tinct. opii (according to age), or pot. brom. (for small babies).

(2) Cover the burn with a piece of dry lint and bandage lightly.

(3) Remove to skilled attention.

The special treatment I use and advocate after (1) is to soak a piece of gauze (or lint) in a solution of flavine and paraffin 1 in 1,000. *Do not squeeze*, and apply to the burn and bandage lightly. I have had excellent results in all degrees of burns from this line of treatment. The flavine and paraffin immediately soothes the injured area and the raw nerve endings, thus preventing further shock. The colder the solution the quicker the relief, and no increase of shock; in fact, I usually pour it on and cover with gauze. I have not yet seen a case of sepsis following treatment with flavine and paraffin. The solution reduces greatly the chances of secondary shock; it is easy to apply and it is cheap. I usually repeat the dressing once in twenty-four hours, dress once daily for three days, then once every two or three days, depending on the amount of inflammation present.

Blisters are *not* opened until twenty-four hours after the application of the first dressing. Primary and secondary shock have by then been overcome, and the antiseptic value of the solution has had time to affect the area and surrounding skin. The blisters, when opened, are done so under as aseptic conditions as possible. Once the inflammation has subsided elastoplast strips complete the granulation process. I have found that the combination of flavine and paraffin followed by elastoplast greatly reduces skin contracture.

Where the burn has been of extreme severity and/or important locale the case is referred to hospital after treatment of primary shock. I still apply flavine and paraffin to the burn because of the immediate relief locally. Cleansing of the area in hospital will, I presume, be conducted under an anaesthetic, and the journey to the hospital is rendered as free from pain as possible.—I am, etc.,

Brighton, Dec. 18. LEONARD A. DE DOMBAL.

First Hospital for Diseases of Women

SIR,—I read with great interest the excellent article on J. Marion Sims by Prof. Chassar Moir (December 7, p. 774). In it he concludes that the hospital founded by Sims in New York in 1855 was "the first hospital, in the modern sense of the word, to be devoted to the treatment of diseases of women, and it thus marks the origin and recognition of gynaecology as a medical specialty in its own right." The credit for the earlier establishment of an institution for the treatment and study of gynaecology must go to London and in particular to Dr. Protheroe Smith. In 1842 I quote from the early records of the Hospital for Women, Soho Square: "the expediency of having a hospital for the exclusive reception and treatment of poor women afflicted with diseases peculiar to their sex . . . having been brought under the consideration of several gentlemen resident in London by a member of the medical profession . . . a provisional committee of noblemen and gentlemen was formed . . . month of August of that year." The hospital thus founded was opened in Red Lion Square on January 25, 1843. Forty years later the Hospital for Women moved to Soho Square, where it still stands, and is thus the oldest hospital in the world to be devoted exclusively to gynaecology.—I am, etc.,

London, W.1, Dec. 20 W. R. WISEMAN.

Treatment of Stomatitis in Children

SIR,—I find that the following mixture is effective in the treatment of stomatitis in infants; both the local lesions and the pyrexia subside in three or four days. I think the fruit mixture works fairly well even if it is spat out. For a child of 3:

R Pot. iodid. ... ... gr. j
Liq. hydrarg. perchlor. ... ... m viijss
Glycerini ... ... m x
Aq. fontis ... ... ad fl. dr. j
q.q.h.

The local treatment described in the annotation in the *Journal* of December 14 (p. 838) is extremely difficult to do for refractory infants. In adults and older children I have found local treatment with liq. arsenicalis or sol. acriflavine 1 in 1,000 effective.—I am, etc.,

Coventry, Dec. 18 DONALD FROST.

Tetanus and the Need for Prophylaxis

SIR,—Perusal of the correspondence on the use of tetanus antitoxin leads me to the surprising deduction that in the past it has not been in regular use as a prophylactic in all London hospitals. For many years every casualty with an open wound admitted to the wards of the Northampton General Hospital has received tetanus antitoxin on admission. During this period a number of cases of tetanus, mostly fatal, have been admitted, but I have never seen the disease arise in a patient who has been given antitoxin. In 1918 a soldier fell from his bicycle and sustained a slight wound of the leg. He was admitted to an auxiliary hospital, developed tetanus, and died. The house-surgeon, when questioned, stated that the man had not been given the usual dose of antitoxin because he was not suffering from a gun-shot wound. It appears that the point of view of that house-surgeon is not so unusual as I thought.—I am, etc.,

Northampton, Dec. 19. *C. C. HOLMAN.*

SIR,—Messrs. W. McAdam Eccles and Frank Coleman (December 14, p. 846) seek to elicit information as to the use of tetanus antitoxin in England and Wales for casualties with open wounds. This question and that of Dr. H. H. Sanguinetti (November 23, p. 720) as to the occurrence of tetanus from London soil and the advisability of giving tetanus antitoxin in all cases of open cuts or wounds where there is a possibility of contamination by soil are answered by Drs. V. H. Addison, A. R. Nettleton, and J. E. G. Earle (December 14, p. 847).

I was attached in the autumn of 1914 to a French hospital at Dinard which received in special wards all cases of tetanus coming from the French Army from the battlefields along the River Marne, where, as stated, the soil is much cultivated and market gardens for Paris existed. These cases of tetanus had received no tetanus antitoxin, and, indeed, treatment had been unavoidably delayed. Similarly, in September, 1914, several, mostly fatal, cases of tetanus were treated in No. 1 General Hospital at St. Nazaire in Brittany, where my wife was nursing, among the British troops after their retreat from Mons.

Tetanus is truly a "horrible disaster," but it need hardly occur, for I can confirm Messrs. McAdam Eccles and Coleman's statement that a "dramatic lessening" of cases and of the death rate was brought about by the introduction of tetanus antitoxin, at any rate over-seas, during 1914 to 1920. Hence I suggest that there is past and present evidence to warrant that the instructions in Section 15 of E.M.S. Memorandum No. 4 for England and Wales that "tetanus antitoxin *should* be given to all casualties with open wounds" should be strongly advised and be carried out when the possibility of contamination of such cuts or wounds by soil exists.—I am, etc.,

Woking, Dec. 16 F. G. BUSHNELL.

Dangers of Sulphapyridine

SIR,—I cannot agree with Dr. W. F. Corfield in his statement (November 16, p. 682) that sulphapyridine soluble can be given into the gluteal muscles without any particular precautions. If given subcutaneously ulceration of the skin with a persistent sinus results. If given deeply there is a grave danger that one of the larger branches of the sciatic nerves is involved. I have seen six cases of foot-drop with varying degrees of anaesthesia result from this accident. Although most cases showed varying degrees of recovery, often with intensely painful muscles, one case showed almost complete foot-drop after three months. Another case developed gluteal paresis, so that he was unable to fix the pelvis three months after receiving the injection. Children seem particularly liable to develop gluteal weakness owing to the motor nerve being partially or completely destroyed. So long as the affected muscle shows a response to faradism a nearly complete recovery appears to take place. Unless there is a good and plentiful blood supply to the part injected no absorption takes place, so that destruction of the near-by tissue begins. Microscopically, at first, there is what appears to be a hyalinization of the cells where the solution has reached. If the blood supply is good the fluid is absorbed and the cells ultimately recover, but if the blood supply is bad the cells undergo necrosis and later fibrosis.

I consider that 3 c.cm. is the maximum amount that should ever be used in one place at one time, because the body is unable to absorb more, and instead of its being absorbed the tissues are destroyed. Three c.cm. is probably a dangerous amount to give to a child. Intramuscular sulphapyridine should, I think, only be given in an emergency while arrangements are made for giving it by the intravenous route if for any reason the patient cannot absorb the drug from the stomach or if a high concentration is required. Though crippling dangers are at present rare, this is no excuse for not knowing that they may occur, especially when with the increasing use of the intramuscular route in inexperienced hands they will become more common.—I am, etc.,

A. W. FRANKLAND,
Nov. 22. Lieutenant, R.A.M.C.

Rationalization of the British Drug Industry

SIR,—Your annotation with the above title (December 21, p. 875) really deals with two subjects—the nomenclature of new drugs and a proposal for rationaliation of the drug industry by nationalization or by the formation of a British version of the I.G.F. To advocate nationalization is a trifle dangerous if the British Medical Association is to continue to oppose application of the same principle to the medical profession. The idea of a financial merger is being freely canvassed at the present time by industrial interests that hope to control the combine.

But, leaving the realms of high finance and speaking as a member of the medical profession, I believe that most doctors will agree that the multiplication of proprietary synonyms is to be deplored: and the B.M.A. will have solid support for

any steps they may take to put a stop to this unfortunate practice. On the other hand there may be many in the profession who will regard as ungenerous the fact that you give a German firm credit for the drugs they gave the world, while you suppress the name of the only British firm that can claim to be associated with the production of "sulphapyridine, sulphathiazole, and the new trypanosomicidal drugs of the guanidine and amidine class."

The *Journal* has consistently preferred to use the American term "sulphapyridine" to describe the drug discovered by a British firm of manufacturing chemists, and yet the *Journal* uses the name "Bayer 205." Whatever the reason for such discrimination, I am satisfied that the medical profession as a whole will prefer to remember the name of the firm which gave the world M & B 693.—I am, etc.,

May and Baker, Ltd.,
Dagenham, Dec. 27. ROBERT FORGAN.

Obituary

RAYMOND PEARL, Ph.D., LL.D.

Professor of Biology, Johns Hopkins University

We regret to announce the death of Prof. Raymond Pearl, who since 1930 had been Professor of Biology, School of Hygiene, Johns Hopkins University.

Raymond Pearl was born at Farmington, New Hampshire, U.S.A., in 1879. After taking his A.B. at Dartmouth College in 1899 he worked in many universities, including the University of Leipzig and University College, London, where he was from 1905 to 1906. From 1918 to 1925 he was professor of biometry and vital statistics in the School of Hygiene, Johns Hopkins University, where he was also professor of biology in the School of Medicine and director of the Institute of Biological Research. He was Heath Clark Lecturer at the University of London in 1937. He made numerous contributions to scientific literature, and was editor of *Human Biology*. We are indebted to Professor Major Greenwood, F.R.S., for the following appreciation.

A letter from Baltimore brings me the news of the death from coronary thrombosis of Raymond Pearl. His many friends in England will find it hard to realize the extinction of that buoyant personality, the very image of physical and mental vigour, a man of 61 who could have passed for 40.

Pearl was a pupil of Karl Pearson in 1905–6. His earliest work was biometric in the strict sense of the term—a study of paramoecium—and followed by an equally careful and laborious study of human brain weights. Then he did important work on the genetics of poultry in Maine. I first met him in 1917 or 1918, when he was in England as a member of Mr. Hoover's staff. In 1918 he became the first professor of biometry and vital statistics in Johns Hopkins University; later he exchanged this post for the chair of experimental biology. Pearl was primarily a biologist, but his cultural background was wide; he knew and loved the best books in ancient and modern languages, and in a charming little book (*To Begin With*) tried to humanize the outlook of young students of science.

It is common form in literary circles to sneer at the literary crudeness of scientific writers. If we conveniently ignore such men as Huxley, Tindall, Helmholtz, and Karl Pearson, there is enough truth in the generalization to sting. Pearl had command of an admirable prose style informed by wide reading and a sense of humour. As the demand for books and papers is much greater in America than here he was tempted to write very often, and so led occasionally to overstatement, to the delight of pedants—the kind of people who rejoice over a mistake in Macaulay. Those who have had, and resisted, the same temptation may cast stones. His output was so large that even in a formal notice a good deal would not be mentioned; in a personal tribute it is permissible to speak only of what seemed to the writer both characteristic and first-rate. I should give first rank among his books to *The Rate of Living*, published in 1928; it is a small book but epitomizes the work of years. Pearl first used the method of experimenting on populations—now familiarized by the mouse colonies of experimental epidemiologists—and worked on the fruit fly *Drosophila*. He was the first biologist to compute from adequate data orders of dying out, or life tables, for any animal but man. Pearl pointed out that if we wished to study the general relation of age and mortality we should begin at the age at which mortality is at a minimum—namely, after the troubles of immaturity have been surmounted (in man at about age 12, in insects at the imaginal stage). Pearl's work is open to minor technical objections, but is of great interest, and will, one hopes, be continued. In later years he gave much of his energy to the study of human population growth; important as this has been it is not, at least to me, so fascinating as the *Drosophila* researches. One feels that he may have been near that elusive sprite, a genuine "law" of mortality.

Pearl was not a particularly eloquent lecturer, but he was a great and inspiring teacher, beloved by those who worked with him and large-minded enough to encourage those working on subjects or along paths which did not attract him. To those who only met him casually he may sometimes have seemed a trifle cynical ("hard-boiled" is, I believe, the idiomatic term). Actually he was one of the kindest of men, and took immense pains to be of service to others. Indeed it is as a humanist that I now think of him. He did fine scientific work, but his personal influence on friends and pupils may well have benefited science more than his direct contributions to it. He broadened the outlook and raised the courage of all who came under his influence. It is very hard for a pure Cockney like me (in a life of more than sixty years I have never passed more than three consecutive months at a greater distance than twelve miles from Shoreditch Church), when he thinks of an American, *not* to picture a thin man with a cigar in the corner of his mouth talking about dollars in a nasal voice and always in a hurry. But in my case this phantasm is at once dispelled by the gracious image of a cultivated gentleman who loved to talk *at leisure*, over a glass of wine, about men, women, and books. That was Raymond Pearl.

WILLIAM WALLACE, M.D., F.R.A.M.

Dr. William Wallace, who recently died at the age of 80, was well known as a composer and writer on musical subjects. He was educated at Fettes College and Glasgow University, where he qualified M.B., C.M. in 1885, proceeding to the M.D. in 1888. After qualification he was house-physician and house-surgeon to the throat department of the Royal Infirmary, Glasgow, and subsequently, for two years, house-surgeon to the Eye Infirmary, Glasgow. In the last war he served as a temporary captain in the R.A.M.C. and was ophthalmologist to the Colchester Military Hospital and Inspector of Ophthalmological Centres in the Eastern Command. Among his medical publications was an article in the *R.A.M.C. Journal* in 1921 on methods of examining the vision of recruits and soldiers. He pursued his second profession—that of music—with unabated interest from the eighteen-nineties till the beginning of the war of 1914–18. His early orchestral work, "The Passing of Beatrice," was first produced at the Crystal Palace in 1893. In a series of orchestral tone-poems one of the most famous was "Villon." Dr. Wallace was the author of several works on musical subjects, and his versatility is shown by the fact that he also contributed articles on Greek typography to the *Journal of Hellenic Studies*. He had, as well, a high degree of skill as a painter, and a hundred of his water-colour drawings of injuries to the eye are preserved in the Army Medical War Museum.

Medical Notes in Parliament

The Nation's Bread in Wartime

Replying to a request by Lord Strabolgi on December 19 in the House of Lords, Lord WOOLTON made a statement regarding bread. He said the bakers had never failed to provide the bombed areas with bread. The Government had arranged to give for three months a subsidy equal to 1d. on the quartern loaf, payable on all bread sold at 8d. per quartern or less. He had arranged with the bakers that they would supply at the same price either a white bread or a wholemeal bread. He had decided on an 85% extraction for wholemeal flour. This wholemeal would be supplied at the same price as "national straight run" white flour and would contain the necessary quantities of vitamin B. The virtues of wholemeal bread had been known to the public and widely advertised for years, but the quantity of bread made from high-extraction flour was only a little over 8% of the bread consumption of the country. Most people did not like to change habits or did not like the bread. He could not insist on the public eating wholemeal bread, but drew public attention to the advantages which those who ate it were likely to obtain. Public interest had been roused about the fortifying of white bread. For some four years before the war the flour-milling industry of this country had spent money on research for the best means of remedying the recognized deficiency of white flour in vitamin B_1. They found a means of introducing it into white flour without affecting the appearance, the baking, or the keeping. The Government considered a report on this matter by its Scientific Subcommittee. It asked him to secure that white flour was fortified with vitamin B, and concurrently that wholemeal bread was available to all the public who wanted it. Supplies of vitamin B, would not be available in any quantity until the spring of 1941—probably in May. The committee also drew attention to the importance of the addition of certain calcium salts to flour. The printed literature of the Ministry of Food would continue to advocate the virtues of wholemeal bread for those who found it a suitable diet.

Lord BALFOUR OF BURLEIGH said that from the earliest days of the war the Medical Research Council gave the question of bread attention. It decided to recommend that bread should be made of an extraction of the wheat grain of not less than 80% to 85% in order to contain the germ, as much as possible, of the aleurone layer, and the finer portions of the bran. A further recommendation was that a small percentage of calcium salt should be added to this flour to overcome the defect of bread, especially of bread made from a high-extraction flour, of preventing the utilization of calcium by the body. The addition of calcium would increase calcium retention, to allow better bone and tooth formation. The Medical Research Council found that calcium deficiency had long been a defect of nutrition among people in this country. This deficiency had especially to be overcome in the poorer sections of the community which had difficulty in obtaining the protective foods, milk, cheese, and vegetables. The Medical Research Council thought everybody ought to eat wholemeal bread, but recognized the difficulties Lord Woolton had pointed out. There was immense popular prejudice. The Council would cordially approve the addition of vitamin B to the 70% extraction flour. This would make that flour better, but the Council did not think that even with the addition of calcium and vitamin B it would be as good as the 85% extraction flour. The latter would not make brown bread, but bread of an "off-white" colour.

Lord WOOLTON added that the high-extraction flour would be available to housewives. He would continue to rely on the scientists who had given the results of their research on this problem. It might become necessary to press hard for the consumption of high-extraction flour to save shipping.

Fortified White Flour

In reply to Mr. De La Bère on December 18, Major LLOYD GEORGE said an advisory committee including scientists and representatives of the various trade and other interests involved had been appointed for consultation on administrative and technical questions in connexion with the introduction of synthetic vitamin B and calcium into white flour. The committee had held two meetings and made recommendations on matters of principle and detail. At the same time negotiations had been proceeding with manufacturers and potential manufacturers of aneurin. It was expected that the distribution of fortified flour on a national scale would commence next spring. No monopoly would be given to a particular firm.

Surgery Hours and the Black-out

On December 19 Captain PEVERGOT asserted that panel doctors had in many cases made no attempt to adjust their consulting hours to black-out conditions and that in consequence very few insured persons attended evening surgeries. Mr. MACDONALD answered that at the outbreak of war his Department recommended insurance committees to review the arrangement of surgery hours, having regard to the restriction of lighting and other war conditions. He had no reason to think there was any general dissatisfaction as to surgery hours, but he would inquire into any complaint which might be brought to his notice.

Sir ROBERT YOUNG suggested on the same date that the early closing of chemists' shops made it difficult for persons working to 5.30 or 6 p.m., who had to visit a doctor, to get the medicine prescriptions made up before the shops closed. Mr. HERBERT MORRISON replied that the general closing hours of shops did not apply to the sale of medicine, and so did not prevent chemists from making up doctors' prescriptions at any hour in the evening. Chemists who dispensed national health insurance prescriptions were obliged to be available for service until the hours fixed by the local insurance committee, who had regard for the needs of workers in the locality. He had received no evidence of hardship resulting from chemists closing earlier on account of the black-out and air raids.

Mobile First-aid Units

Replying to Mr. Brooke in the House of Commons on December 19, Mr. MACDONALD stated that the average number of occasions on which a mobile first-aid unit had been sent to an incident in London during October and November was 4.4. In addition the doctor, usually accompanied by a nurse, had been sent out without the rest of the unit on 5.3 occasions on the average, making a total of approximately 10. Up to the present these units had been used rather less than was expected, but their use, which had proved of great value, must depend upon the nature of the incidents. The nursing personnel were available to help in the work of the hospital or first-aid post on which the unit was based, and to reinforce neighbouring first-aid posts when necessary.

Immunized Persons as Disease Carriers

Asked by Mr. Groves if he had considered the danger of persons immunized against diphtheria and enteric fever becoming carriers of the germs of these diseases, Mr. MACDONALD replied on December 19 that when a majority of the child population had been immunized against diphtheria the danger which Mr. Groves apprehended would for all practical purposes disappear. There was no evidence that a community a portion of which had been immunized against enteric fever contained a greater proportion of carriers than one not so immunized.

Replying on the same date to Major Heilgers, Mr. MACDONALD said the immunization of children against diphtheria in the large numbers which he desired could be most expeditiously achieved by means of sessions at selected places, where children could be assembled in convenient numbers. The free supply of material to local authorities was in a form convenient for this, and not for distribution to private medical practitioners. Major HEILGERS further reported that there appeared to be a shortage of diphtheria toxoid at the Ipswich Emergency Laboratory. Mr. MACDONALD said all demands which had been made on this laboratory would be met within the next few days. The stocks at present held by the laboratories were generally sufficient to meet current requirements, and provision had been made for further substantial supplies as required.

Medical News

Air Vice-Marshal H. E. Whittingham, C.B.E., has been appointed Director-General, R.A.F. Medical Services, Air Ministry, from March 1, in succession to Air Marshal Sir Victor Richardson, K.B.E., C.B.

Dr. Robert D. Defries has been appointed Director of the School of Hygiene and of the Connaught Laboratories, University of Toronto. During the past twenty-five years he has been prominent in the work of these two institutes, having early in 1915 become actively associated with the late Dr. J. G. FitzGerald, whom he now succeeds.

A meeting of the Society for the Study of Inebriety will be held at the Medical Society of London, 11, Chandos Street, W., on Tuesday, January 14, at 4 p.m., when Dr. George B. Wilson will present a paper on "A Seventy-five Years' Survey of the Liquor Problem in Great Britain."

The B.B.C. announces that from January 6 to 10 a series of special health talks for schools will be given each morning at 11 a.m. on how germs spread; the body's defences; cleanliness and health; cool heads and warm feet; sleep and rest.

A meeting of the Shaftesbury Military Hospital Medical Society will be held at the hospital on Tuesday, January 7, when clinical cases presented by members will be on view from 2.30 p.m. to 3 p.m. A discussion will follow.

Canada, states the *Daily Telegraph*, is to set up a blood "bank" to provide transfusions for 20,000 military and civilian casualties. The Canadian Government will provide all equipment and meet the running costs of the scheme.

According to a report in the *Times* the American Red Cross is sending to this country sufficient material to immunize 1,000,000 children against diphtheria. In response to an appeal from the Ministry of Health one-fifth of this—that is, material for immunizing 200,000 children—is arriving by air; the remainder is following by sea. It is stated that the Ministry of Health aims at immunizing at least 5,000,000 children before the beginning of the diphtheria season. There are in this country some 11,500,000 children under 15 years of age.

The New Year Honours List includes the award of the O.B.E. (Civil) to Mr. Edward Thomas Both of Adelaide, South Australia, the designer of the artificial respirator which was adopted by Lord Nuffield for distribution among the hospitals of the Empire.

Dr. H. Douglas Singer of Chicago has been elected president of the American Neurological Association.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examination indicated:

FINAL M.B.—*Part II (Principles and Practice of Physic, Pathology and Pharmacology)*: W. W. Brigden, W. R. Burkitt, O. Clarke, R. E. W. B. Comerford, J. G. Craddock, G. E. H. Enderby, M. A. Fawkes, J. S. Hesketh, A. Holmes-Smith, D. J. Howell, D. M. Jackson, F. S. Jackson, D. W. M. James, E. J. C. Kendall, D. Laing, L. A. Little, I. B. Mackay, W. B. D. Maile, A. Maples, P. F. Milling, R. Morton, A. G. E. Pearse, F. T. G. Prunty, L. Read, T. W. Rowntree, W. M. Scott, C. S. N. Swan, D. E. Thompson, R. C. Tufton, D. N. White, F. A. Whitlock, J. O. D. Williams, F. J. Y. Wood. *Women:* M. Redfern Davies, R. M. Stevenson.

UNIVERSITY OF BRISTOL

The following candidates have been approved at the examinations indicated:

FINAL M.B., CH.B.—N. F. W. Brueton, Gwendolen M. Higgins, Megan E. Jones, J. M. Joshua, J. K. Lewis, T. E. Lloyd, H. Mullen, P. W. J. Searle, R. D. R. Shanks. *In Group I (completing examination)*: G. H. Harvey, J. W. J. Newton, D. A. Squire. *In Group II (completing examination)*: Winifred M. Curgenven-Robertson, Clara J. Fraser, Ruth M. Hunter.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh, held on December 17, with Dr. H. M. Traquair, President, in the chair, the following candidates, having passed the requisite examinations, were admitted Fellows:

L. H. Aitken, A. S. Dill-Russell, C. J. H. Gibson, C. Latto, C. T. Moller, Elizabeth McCallum, G. D. McDowall, I. A. M. MacLeod, M. S. Nirankari, H. Wapshaw.

The Services

ARMY AWARDS

Military Cross

The M.C. has been awarded to Major Walter Dalgleish Jackson and Lieuts. Ronald Rodger Gordon and Martin Turner Read, R.A.M.C., in recognition of gallantry in France and Flanders; and to Lieut. John Graham Lord, R.A.M.C., in recognition of gallant conduct in action with the enemy.

Mentions in Dispatches

The names of the following have been brought to notice in recognition of distinguished services in connexion with operations in the field, March to June, 1940.

Commands and Staff: Major-General J. W. L. Scott, D.S.O.; Colonels R. Errington, C.B.E., M.C., T.D., C. L. Franklin, M.C., A. Hood, C.B.E., E. M. O'Neill, D.S.O., A. C. Searle, M.C., and S. G. Walker; Lieut.-Colonel (Acting Colonel) J. C. A. Dowse.

Royal Army Medical Corps: Lieut.-Colonels S. Arnott, D.S.O., J. W. Hyatt, A. R. Barlas, J. H. Ward, D.S.O., M.C., C. H. K. Smith, M.C., D. McVicker, M.C., F. G. Flood, M.C., A. Bremner, G. G. Drummond, W. A. Ramsay, T. Parr, R. E. Rees, M.C., K. A. M. Tomoroy, and W. H. Marston; Majors (Acting Lieut.-Colonels) L. C. Lade, J. H. Bayley, M.C., and E. P. N. Creagh; Captains (Acting Lieut.-Colonels) C. R. Sadler and H. L. G. Hughes, D.S.O., M.C.; Major (Temporary Lieut.-Colonel) W. M. Cameron, O.B.E.; Majors J. G. Black, J. A. Brocklebank, R. G. Evans, F. A. Donolly, W. E. Underwood, J. Houston, J. Boyle, G. Punshon, A. R. H. Champion, A. E. King, L. B. Stott, J. D. W. McCracken, H. F. Wattsford, Y. Moore, O. D. Jarvis, O.B.E., D. A. O. Wilson, E. I. B. Harvey, A. D. Bourne, G. R. McNab, R. T. P. Tweedy, W. B. F. Orr (since deceased), A. D. Davidson, S. A. Maddocks, J. E. Morrison, St. C. E. J. Barrett, A. D. Briscoe, F. B. Mackenzie, D.S.O., M.C., and D. N. Nicholson; Captains (Acting Majors) J. H. J. Crosse and A. G. Whitfield; Lieuts. (Acting Majors) A. C. Stevenson and D. P. McCoy; Lieut. (Temporary Major) D. M. Jones; Captains F. Murray, W. G. Bateson, I. B. Pirie, O. M. Walker, W. H. Valentine, W. O'Callaghan, R. Rutherford, F. V. Allen, P. E. Cresswell, L. Evans, and F. J. Henderson-Begg; Lieuts. (Acting Captains) H. W. Beetham and J. A. Farrell; Lieuts. R. C. Little, D. I. McCallum, A. S. C. Hobson, J. W. Landells, J. W. Dowzer, P. K. Walker, R. Bevan, C. E. Stuart, J. P. Lane, J. G. Munro, F. R. Store, J. C. Taylor, P. Louis, K. D. Moynagh, D. H. Jones, C. Hope, W. H. Hylton, M. R. Grace, C. D. Preston, F. J. D. Webster, C. D. Anderson, J. A. Farfor, M. R. Joseph, G. H. Scoular, E. Cullen, A. T. Blair, R. MacKay, M. W. Paterson, G. S. Sheill, W. G. J. Gordon, J. H. Rose, N. C. Rodgers, J. J. Hogan, M. Herman, and L. H. Crosskey.

The names of the following have been brought to notice in recognition of distinguished services in connexion with operations in Norway.

Commands and Staff: Colonels G. A. Blake and P. H. Mitchiner, C.B.E., T.D.; Lieut.-Colonel (Acting Colonel) W. E. Tyndall, M.C.; Major (Acting Lieut.-Colonel) A. J. Beveridge, O.B.E., M.C.; Captain (Acting Major) R. O. Brooks.

Royal Army Medical Corps: Captain (Temporary Major) J. Bruce; Lieuts. A. E. Loden and A. E. Burgess.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Past and present members of the Liverpool Medical School will learn with regret that Probationary Surgeon-Lieutenant BEN HAROLD BRINDLE, R.N.V.R., was among those who lost their lives when H.M.S. *Forfar* was sunk by enemy action. He joined the R.N.V.R. only a few weeks ago, after returning from a voyage to Australia as ship surgeon. After graduating M.B., Ch.B at Liverpool in June, 1938, he was resident for a time at the David Lewis Northern Hospital and at Walton

Hospital, Liverpool. The sympathy of the profession and especially of those members, many of whom are in the Services, who belonged to his year at Liverpool, will go out to his mother, his fiancée, and to his brother, Major W. S Brindle, R.A.M.C., in their tragic loss.

ROYAL ARMY MEDICAL CORPS

Wounded

Lieut. Robert Elmer Horton

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

Increases were recorded in England and Wales during the week in the incidence of diphtheria, measles, and whooping-cough, and of cerebrospinal fever, enteric fever, and dysentery. All these diseases, and also scarlet fever, pneumonia, and acute poliomyelitis, are more prevalent now than they were during the corresponding week last year; in some instances the increase is only slight. The incidence of most of these diseases has been rising steadily in the last few weeks, and this might cause disquiet were it not for the fact that cases of diphtheria and scarlet fever are fewer in number than they were in the last "normal" year—namely, 1938. Comparable figures for measles and whooping-cough are not available.

Although the position as regards incidence for the country as a whole is still favourable, new factors have raised new problems which the usual measures of disinfection and isolation fail to meet. The evacuation of large numbers of susceptible subjects to areas hitherto more or less immune from infectious diseases in other than sporadic form increases the risks of spread, but if to this are added overcrowding in billets and inadequate hospital accommodation for suspected or manifest cases, then sooner or later the resources of the reception areas will be overtaxed. Although there have been no serious outbreaks of enteric fever so far, the risk of pollution of water supplies by air-raid damage to the drainage system has led to increasing inoculation against this disease. Little attention has been paid to whooping-cough, although protective measures are available, because so far the incidence has been comparatively low and the attack generally benign.

As regards measles, no reliable method of active immunization has yet been devised, and the physician must therefore wait until there has been exposure to the disease (unless deliberate exposure is practised) before the modifying effect of immune measles serum can be conferred. For this purpose serum from adults, such as that which is being collected from donors for the E.M.S. blood or serum "banks," could, if necessary, be made available in reception areas as the need arises. For temporary protection of selected individuals in whom an attack of any kind might be detrimental convalescent serum is the only consistently reliable agent, although some preparations of placental extracts have yielded good results.

The incidence of diphtheria in the week under review is highest in: Lancaster 275 (Liverpool 94, Manchester 24, Salford 18, Bolton 13, Bootle 12, Wigan 10, Widnes M.B. 10); Glamorgan 147 (Swansea 64, Cardiff 10, Aberdare U.D. 10, Mountain Ash U.D. 8, Llantrisant and Llantwitfardre R.D. 8, and from 1 to 7 in 16 out of the remaining 19 urban and rural districts); Yorks, West Riding, 132 (Sheffield 29, Bradford 15, Leeds 8, and widely scattered in smaller administrative areas); Devon 70 (Plymouth 37, Exeter 15); Chester 65; Durham 61 (Sunderland 11, Jarrow 11, South Shields 8); Gloucester 56 (Bristol 24, Gloucester 21); Warwick 56 (Birmingham 43); London 53 (ranging from 1 to 6 in 20 out of the 29 metropolitan boroughs). The disease is at present more deadly than it was in 1938, when incidence was higher; many factors, some extrinsic, may be responsible, but increased frequency of the more virulent starch-fermenting strains is probably the most important single factor. In Scotland notifications fell slightly from the level of the previous week, but remain greatly in excess of those recorded in the corresponding weeks of 1939 and 1938; no fewer than forty-three out of the fifty-five administrative areas were affected, notably the counties of Lanark 35, Fife 21, Dumfries 16, Renfrew 14, Clackmannan 10, and the burghs of Glasgow 139, Dundee 48, Edinburgh 34, Paisley 21, Aberdeen 19, Kirkcaldy 10. In Scotland, too, the prevailing type, as reflected in deaths, is highly virulent.

No. 45

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended November 30, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included) (b) London (administrative county) (c) Scotland (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London) (b) London (administrative county) (c) The 16 principal towns in Scotland (d) The 13 principal towns in Eire (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1940					1939 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	151	10	42	—	6	27	2	12	1	—
Deaths	1	1	2			—	—	2		
Diphtheria	1,435	53	490	31	29	1,010	45	241	55	47
Deaths	39	3	13	1	2	19	—	3	1	3
Dysentery	109	—	34	4	—	50	2	41	—	—
Deaths			1	—	—			1	—	—
Encephalitis lethargica, acute	4	—	2	—	—	1	—	1	—	
Deaths		—	—				—	—		
Enteric (typhoid and paratyphoid) fever	33	1	5	6	1	13	1	2	12	—
Deaths	—	—	—	—	—	1	—	—	—	—
Erysipelas		19	64	13	5			52	9	
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years	32	5	12	4	5	36	4	8	9	4
Deaths										
Measles	14,486	302	4895		8	2,206	9	19		39
Deaths	14	—	3	4	—	—	—	—	—	2
Ophthalmia neonatorum	74	3	23		—	75	1	15		2
Deaths										
Pneumonia, influenzal*	675	44	16	—	5	461	31	5	—	22
Deaths (from influenza)	26	5	1	—	2	23	5	4	—	—
Pneumonia, primary			202	13				139	11	
Deaths*		55		11	7		5		4	6
Polio-encephalitis, acute	1	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	22	—	1	—	—	17	4	2	—	—
Deaths		—	—				—	1		
Puerperal fever	3	3	8	4	—	1	1	10	2	—
Deaths		—					—			
Puerperal pyrexia	109	3	6		—	156	7	12		4
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,634	86	233	48	53	1,355	31	155	65	87
Deaths	—	—	—	—	—	1	—	1	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths		—	—	—	—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths		—	—	—	—		—	—	—	—
Whooping-cough	2,369	17	2652		24	1,244	28	20		—
Deaths	11	—	6	2	11	5	2	2	1	1
Deaths (0-1 year)	290	22	62	24	22	311	45	61	36	17
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	5,740	789	605	201	117	4,673	718	581	172	135
Annual death rate (per 1,000 persons living)			12.3	13.4	10.2			11.8	11.6	11.9
Live births	4,389	340	736	280	163	4,923	637	797	335	182
Annual rate per 1,000 persons living			14.9	18.7	14.3			16.1	22.5	16.0
Stillbirths	178	8	38			257	28	40		
Rate per 1,000 total births (including stillborn)			49					48		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† Since January 1, 1940, figures for London (b) have been for all forms of pneumonia; the corresponding figures for 1939 relate to deaths from lobar pneumonia only.

‡ Notification in certain administrative areas only.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

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TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London;* SECRETARY, *Mediocra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Blood-stained Semen

"J. M." writes: With reference to the notes on blood-stained semen, while in Port Elizabeth, South Africa, in 1910 I was called out to see a Kaffir who complained that he had something wrong with his penis. The hut was very dark, but a candle was found and I saw a pool of blood on the floor which would have filled a small teacup. I got him to pass water, but this was quite clear, showing that the bladder and kidneys were sound. He passed a blood cast of the urethra about four to five inches long, showing that the blood came from the urethra and was due to either chronic gonorrhoea or the congestion following too frequent coitus. Kaffirs are well known for their proneness to overmuch sexual intercourse.

Income Tax

E.M.S.—Travelling Allowance

"M.D." asks if the travelling allowance received as a part-time consultant to the E.M.S. is taxable.

*** In strictness the allowance should be excluded from the taxable receipts, and any expenses incurred in doing the work should be excluded from the professional expenses. If the latter amount is difficult to calculate (as may very well be the case where a car is used) it may be more convenient to treat the amount of allowance received as taxable and claim the whole of the appropriate travelling expenses.

Partner on Military Service—Earned Income

"T. R. S." is one of five partners. He was called up for military service in September, 1939, and his pay and family allowance are paid into the partnership pool. A locum is employed, living in "T. R. S.'s" house, the general expense of which is borne by "T. R. S." The inspector of taxes states that no "earned income relief" is due in respect of his share of the practice profits.

*** We do not think that the inspector's attitude would be supported by the authorities. Apart from the hardship which the view he takes of the position would inflict on partners on military service, "T. R. S." is presumably available for consultation from time to time on matters of importance affecting the conduct of the practice, and from that point of view may still be regarded as something more than a sleeping partner. We advise our correspondent to write to the Secretary, Board of Inland Revenue, Somerset House, W.C.2, explaining the facts and asking that the inspector of taxes may be authorized to withdraw his objection.

LETTERS, NOTES, ETC.

Closed-plaster Treatment of Wounds

"MEDICO from the Jungle" writes: The many articles written on this subject of late make one used to practising among natives smile. Surely the closed-plaster treatment is as old as the trees in the jungle. The only difference between this treatment and jungle treatment is that plaster-of-Paris is used and that greater care is taken in producing good alignment and, therefore, better functional results. In the jungle natives have used bamboo splints encased in mud or cow-dung and leaves for the closed treatment of wounds and fractures since at least 2000 B.C. Even many animals, especially the elephant, treat their own wounds in this way, or at least in a modified form, using mud and leaf-sealed dressing. Many so-called ignorant jungle medicine men were even able to produce good functional results by pulleys made from bamboo and other strips of natural fresh sapling trees. Dr. Winnett Orr certainly was a modern advocate of this treatment, but I myself saw this treatment in a modified form used in White Russian army hospitals in 1919 during the revolution. In the wards of Profs. Petroff and Alexanski for fractures and wounds one came across numerous patients in plaster; they used a modified Winnett Orr's method, leaving a window for drainage of pus, but dressings were applied at very long intervals. All their compound fractures were treated in this way.

Herpes Zoster

Dr. A. H. BARTLEY (Maltby) writes: I have been treating several cases of herpes zoster with such remarkable results that I feel this treatment will be welcomed, having met such persistent cases in the past. Briefly the treatment is this. The eruptions are painted with collodion twice daily for three days; a firm film covers the vesicles, and falls off when these dry up. I give pill cannabis indica 1/4 grain t.i.d. for a week. During this medication the pain gradually diminishes, and is much appreciated by the patient, as most analgesics, except morphine, have little effect. The most gratifying part is the good sleep at night, which is the most distressing part of the disease usually. Most of my cases have been in men who were unable to give up their work and were able to carry on with this treatment.

Hospital Infection of Wounds

Dr. BERNARD ROWLANDS writes: I wish to deal with only one source of infection in hospital. It may be possible to combat the menace of dust-borne infection in the wards by modifying their arrangement or construction. As a number of our hospitals will have to be rebuilt before long the subject of improved construction and arrangement is well worth careful thought now. I suggest the transfer of patients from one section of a suitably constructed ward to another section during sweeping and bed-making. A dustproof drop-curtain would then operate to cut off the area in which the patients would then be lying. In some hospitals it would be possible to wheel the vacated beds to a special room for the purpose of re-making them. I hope that when the rebuilding of our hospitals is taken in hand our surgeons will put forward any ideas they may have formed on this subject.

The Mother's Share in Family Allowances

THE CHAIRMAN of the Six Point Group (Miss Dorothy Evans) writes: No doubt many of your readers have studied with interest the pamphlet, *An Aylesbury Broadside*, issued by the *Lancet*, putting forward a proposal for family allowances. My committee hails with approval a scheme from such an influential quarter to remedy a situation which we have long deplored—namely, that the nation's mothers have to carry out in the majority of homes their task of citizen-building without the necessary materials. Moreover, they are called upon to do a great variety of jobs—cooking, catering, cleaning, sick nursing, sewing, infant education, household decoration and repairs of many kinds—and all these without any cash remuneration whatever, as the pamphlet rightly points out. The scheme put forward, while providing for an allowance from the State to the mother in respect of each child if the family income falls below subsistence level, does not tackle the question of the mother's own nutriment, or provide for any small allowance of spending money for her very own, apart from sums which she administers for others. A diagram is given illustrating the proportions spent on various items in a sample budget. There is an item—the husband's pocket money—illustrated by a drawing of a man enjoying a smoke. There is no item the wife's pocket money—nor is she depicted in the act of indulging in any personal gratification. I write in the hope that a scheme of family allowances sponsored by the medical profession will include not only an allowance to the mother wherewith she can feed and clothe her child if the family income is not adequate, but an allowance to the mother or guardian whose time is spent on the tasks necessary for the adequate nurture of the child. The scheme will not achieve the physical improvement hoped for unless this is done. The mother during the nursing stage must have increased nourishment beyond the needs of an ordinary adult. If this is denied and she goes short, as the reports on malnutrition all show that she does, during the arduous years of her childbearing, her offspring will inevitably be under par.

Chocolate in Wartime

Messrs. Cadbury of Bournville send us at the end of each year samples of their products, and, although some of the raw materials used in the manufacture of chocolate are now rationed and Government contracts have to be met, the pleasant custom was continued in 1940, and the usual standard of quality maintained.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY JANUARY 4 1940

MEDICAL PLANNING COMMISSION

THE FUTURE OF THE BRITISH MEDICAL SERVICES

The British Medical Association has, after much consideration, set up a Medical Planning Commission and has invited—and welcomes—the co-operation of the English Royal Colleges and the Scottish Corporations in this work. The terms of reference are as follows:

> "To study wartime developments and their effects on the country's medical services both present and future."

In deciding the size and in choosing the personnel of the Commission the Association has had the view that such a body will be in the nature of an assembly, meeting from time to time to debate large questions of principle. The detailed work of the Commission will be undertaken in committees and subcommittees of the usual size, and their resolutions and recommendations will come for discussion before the Commission itself.

The Association believes that any disadvantage which may be attached to the size of the Commission will be more than offset by the advantage of its fully representative character. Much thought has been given to the age distribution of members of the Commission as well as to its representative character. Its constitution is as follows:

President: T. Fraser, C.B.E., D.S.O., M.B., Ch.B., Aberdeen. Consulting Physician, Aberdeen Royal Infirmary.

Chairman of Council: H. S. Souttar, C.B.E., D.M., M.Ch., F.R.C.S., F.R.A.C.S., Surgeon, London Hospital.

Chairman of Representative Body: H. Guy Dain, LL.D., M.B., Direct Representative of Medical Profession on General Medical Council: late Chairman of Insurance Acts Committee.

Treasurer: J. W. Bone, M.B., C.M., Direct Representative of Medical Profession on General Medical Council: Chairman of General Practice Committee: late Chairman of Medico-Political Committee.

Deputy Chairman of Representative Body: Peter Macdonald, M.D., Ophthalmic and Aural Surgeon, York County Hospital: Chairman of B.M.A. Hospitals Committee.

Royal College of Physicians: 4 nominees, to be announced later.

Royal College of Surgeons: Sir James Walton, K.C.V.O., M.S., F.R.C.S., London; Sir Alfred Webb-Johnson, C.B.E., D.S.O., F.R.C.S., London. Two further nominees, to be announced later.

Royal College of Obstetricians and Gynaecologists: 3 nominees, to be announced later.

Royal College of Physicians, Edinburgh: Charles McNeil, M.D., F.R.C.P., Edinburgh.

Royal College of Surgeons, Edinburgh: Henry Wade, C.M.G., D.S.O., F.R.C.S.Ed., F.R.A.C.S., Edinburgh.

Royal Faculty of Physicians and Surgeons of Glasgow: John Henderson, M.D., F.R.F.P.S., Glasgow.

Society of Medical Officers of Health: G. F. Buchan, M.D., F.R.C.P., Willesden; A. Massey, M.D., Coventry: a County Medical Officer of Health.

Faculty of Radiologists: One nominee, to be announced later.

Medical Women's Federation: Mona Macnaughton, M.B., Ch.B., Newcastle-upon-Tyne; Doris M. Odlum, M.R.C.S., L.R.C.P., D.P.H., London.

Parliamentary Medical Committee: Sir Francis Fremantle, O.B.E., M.P., D.M., F.R.C.P., F.R.C.S.; Haden Guest, M.C., M.P., M.R.C.S., L.R.C.P.

Allen, Frederick Martine Brice, M.D., F.R.C.P., Belfast. Hon. Physician, Belfast Hospital for Children: Member of Council of B.M.A.; Hon. Secretary, Northern Ireland Branch of B.M.A.

Ball, Sir William Girling, F.R.C.S., London. Surgeon, St. Bartholomew's Hospital; Dean of St. Bartholomew's Hospital Medical School; Dean of Faculty of Medicine, University of London.

Bolam, R. Mason, M.B., Ch.B., Newcastle-upon-Tyne. Hon. Assistant, Skin Department, Royal Victoria Infirmary, Newcastle-upon-Tyne; Hon. Secretary, North of England Branch of B.M.A.

Boyde, H. C., M.R.C.S., L.R.C.P., London. Hon. Secretary, Stratford Division, B.M.A.

Brown, James Alexander, M.D., Birmingham. Member of Insurance Acts Committee; Chairman of Birmingham Panel Committee.

Cameron, James Inglis, M.B., Ch.B., F.R.F.P.S., Glasgow. Hon. Secretary, Glasgow Division, B.M.A.

Carter, O. C., M.B., B.S., Bournemouth. Hon. Secretary, Bournemouth Division, B.M.A.; Member of Journal Committee.

Cope, V. Zachary, M.S., F.R.C.S., London. Surgeon, St. Mary's Hospital; Senior Surgeon, Bolingbroke Hospital; President, Medical Society of London; Member of Council of B.M.A.

Coyle, Cecil Dermot, M.B., B.Ch., London. Medical Superintendent of Fulham Hospital.

Daley, William Allen, M.D., F.R.C.P., D.P.H., London. Chief Medical Officer, London County Council.

Dawson of Penn, Viscount, P.C., G.C.V.O., K.C.B., M.D., F.R.C.P., LL.D., F.R.C.S.(Hon.), London. Extra Physician, London Hospital; Past President of Royal College of Physicians and Past President of B.M.A.

Dickson, J. W. L., M.B., Ch.B., Middlesbrough. Secretary, *Middlesbrough Panel Committee.*

Dilling, Walter James, M.B., Ch.B., Liverpool. Dean of Faculty of Medicine, University of Liverpool; Professor of Pharmacology and General Therapeutics, University of Liverpool.

Dyke, Sidney Campbell, D.M., F.R.C.P., Tettenhall, Staffs. Consulting Pathologist, Royal Hospital, Wolverhampton; President, Association of Clinical Pathologists.

Evans, Geoffrey, M.D., F.R.C.P., London. *Physician, St.* Bartholomew's Hospital.

Gordon, Ronald Grey, M.D., F.R.C.P., Limpley Stoke, near Bath. Physician, Royal United Hospital and Children's Orthopaedic Hospital, Bath: late Deputy Chairman of Representative Body of B.M.A.; Member of Council of B.M.A.; Chairman of Journal Committee and Board of Directors of *British Medical Journal.*

Greenfield, D. G., M.D., F.R.C.S., Rushden. Chairman of Conference of Local Medical and Panel Committees; Member of Insurance Acts Committee and of its Rural Practitioners Subcommittee.

Gregg, Edward Andrew, L.R.C.P. & S., London. Member of Council of B.M.A.; Chairman of Insurance Acts Committee of B.M.A.; Chairman of London Panel Committee; and Past-Chairman of London Insurance Committee.

Gray, Frank, M.B., London. Chairman of London Public Medical Service; Member of Council of B.M.A.; Member of Insurance Acts and General Practice Committees.

Harman, N. Bishop, LL.D., F.R.C.S., London. Chairman, Ophthalmic Group Committee; Member of Council of B.M.A.; late Treasurer of B.M.A.

Hastings, Somerville, M.S., F.R.C.S., London, Surgeon-in-Charge of Ear, Nose, and Throat Department and Lecturer, Middlesex Hospital; late Member of Parliament for Reading; Member of London County Council and Chairman of London County Council Hospitals and Medical Services Committee.

Jones, John Arthur Llewelyn Vaughan, M.B., Ch.B., Leeds, Hon. Secretary, Leeds Public Medical Service; Member of General Practice Committee; Hon. Secretary, Leeds Division.

Mackintosh, J. M., M.D., D.P.H., Edinburgh, late Chief Medical Officer, Department of Health for Scotland.

MacWilliam, Henry Herbert M.B., B.Ch., D.P.H., Liverpool, Medical Superintendent, Walton Hospital, Liverpool.

Marks, Urban, M.R.C.S., L.R.C.P., Swansea, Member of the Public Medical Services Subcommittee and of Swansea Panel Committee; late Chairman of Swansea Panel Committee; Assistant Physician to the Swansea Hospital.

Martin, Charles Gutherless, M.R.C.S., L.R.C.P., London, Hon. Secretary, Metropolitan Counties Branch of B.M.A.

Millar, A. F. Wilkie, M.D., Edinburgh, Hon. Secretary and Chairman, Edinburgh and Leith Division, B.M.A.; Member of Scottish Committee and Insurance Acts Committee.

Miller, James Blakely, M.D., D.P.H., Bishopbriggs, Lanarkshire, Chairman, Scottish Colliery Surgeons Committee; late Chairman of B.M.A. Scottish Committee and Scottish Health Services Committee; Member of Council of B.M.A.

Murray, David Stark, M.B., Ch.B., Richmond, Surrey, Hon. Pathologist, Royal Hospital, Richmond, Victoria Hospital, Kingston, and Teddington Memorial Hospital; President of Surrey Branch of B.M.A.; Editor of *Medicine To-day and To-morrow*.

Newell, Robert Leech, M.D., F.R.C.S., Cheadle, Cheshire, Assistant Surgeon, Manchester Royal Infirmary; Lecturer in Surgery, Manchester University; Member of Council of B.M.A.; Member of B.M.A. Hospitals, Health Services Committees.

Picken, Ralph Montgomery Fullarton, M.B., Ch.B., D.P.H., Cardiff, Mansel Talbot Professor of Preventive Medicine, Welsh National School of Medicine; Member of Council of B.M.A.; Chairman of Public Health Committee.

Platt, Harry, M.D., M.S., F.R.C.S., Manchester, Professor of Orthopaedic Surgery, Manchester University; Hon. Orthopaedic Surgeon, Manchester Royal Infirmary.

Shanks, Seymour Cochrane, M.D., M.R.C.P., London, Hon. Director *X*-ray Diagnostic Department, University College Hospital; President, Faculty of Radiologists.

Simpson, Robert Gordon, M.B., B.S., D.T.M., London, Hon. Medical Officer, Wood Green and Southgate Hospital; Chairman, North Middlesex Division of B.M.A.

Smith Sydney Alfred, M.D., F.R.C.P.Ed., F.R.S.Ed., D.P.H., Edinburgh, Regius Professor of Forensic Medicine, Edinburgh University; Dean of Faculty of Medicine, Edinburgh University.

Stewart, Donald, M.D., F.R.C.P.Ed., Birmingham, Hon. Secretary, Association of Industrial Medical Officers; late Medical Officer, Imperial Chemical Industries.

Wand, S., M.B., Ch.B., Birmingham, Member of Council, Insurance Acts Committee, General Practice (late Medico-Political) Committee, Public Medical Services Subcommittee.

Wigfield, Alan Scott, M.B., B.S., Buntingford, Herts, Physician, Royston Cottage Hospital; Hon. Secretary, East Herts Division of B.M.A.

Williams, Oscar, M.B., B.S., Llanelly, S. Wales, Member of Welsh Committee of B.M.A.

Wilson, David, M.B., B.S., Torquay, Honorary Ophthalmic Surgeon, Torbay Hospital; Member of Ophthalmic Group Committee of B.M.A.

Winstanley, S. A., M.B., Ch.B., Urmston, Chairman of Lancashire County Panel Committee and Past Chairman of Lancashire Insurance Committee; Chairman, Manchester Division, B.M.A.; Member, Insurance Acts Committee.

The Commission has power to co-opt additional members, if necessary, to secure representation of a particular class of experience not otherwise represented on the Committee.

The Ministry of Health and the Department of Health for Scotland have been invited to appoint observers.

TREATMENT OF VENEREAL DISEASE BY GENERAL PRACTITIONERS

Another scheme for securing adequate treatment at the present time of cases of venereal disease, and one which is particularly suited to the needs of rural areas, is outlined in the latest circular (No. 2226) from the Ministry of Health to local authorities and approved treatment centres. It provides for the employment by local authorities of suitably qualified medical practitioners who would give treatment at their own surgeries during normal hours of attendance. The procedure, which has been agreed with the British Medical Association, is that local authorities, having decided which areas should be served in this way and the number of doctors required for the work, should invite all practitioners in the area to apply for service, and select from these the number required. Practitioners who apply must provide evidence that they have performed the following operations: (1) spread microscope slides with discharge from twelve patients (including six females) for examination for gonococci; (2) scraped three lesions suspected of being early syphilitic, and collected in twelve capillary tubes the juice thus made to ooze from them; (3) taken six specimens of blood; (4) given twelve intravenous injections of neoarsphenamine or of stabilarsan and twelve intramuscular or deep subcutaneous injections of bismuth compound. Those who desire to qualify for service will be given training facilities at any treatment centre. The fees payable will be as follows:

For each initial attendance for diagnosis and treatment	10s. 6d.
For every subsequent attendance	7s. 6d.
In every case where a visit to the patient's residence proves necessary during treatment ...	7s. 6d.
(with a mileage allowance of 3d. a mile each way for every mile in excess of two)	

All necessary drugs and equipment will be supplied by the local authority free of charge, and practitioners will be required to keep simple records, suggestions for which accompany the circular. Any local authority not already having a specialist V.D. officer on its staff will appoint such an officer, probably on a half-time basis, whose duty it will be to supervise the treatment given and the records kept, and be available for consultation in difficult or complicated cases. A copy of the Ministry's circular has also been sent to medical officers of health and to medical officers of treatment centres.

Correspondence

Medical Calling Up

SIR,—I would like to support Dr. Cecil B. F. Tivy in his letter (*Supplement*, December 14, p. 53) that: (1) Doctors of the R.A.M.C should be kept for medical duties and administrative work handed to laymen. Why, for instance, should one spend years acquiring medical knowledge, enter the Army, and be used to see to washing contracts, inspection of kit, dealing with correspondence about a hundred and one things, of which not even the one has any medical bearing? (2) Reserves need not be kept idle.

My own case will illustrate the point. I entered the Army in September, 1939. Since then I have averaged not more than a quarter of an hour's medical work per day: and that is literally true. Part of the time is understandable, for we were standing by for embarkation, manning posts in prospect of an invasion, etc., but since the acute period has subsided I have been asked by a surgeon to help with his work, as I had had the particular experience he required. Despite all applications for leave while the unit was inactive the request was refused: so I remain doing nothing. Surely it would not be impossible to release doctors temporarily, on the assurance that they would be available at forty-eight hours' notice.—I am, etc.,

Dec. 17 R.A.M.C. OFFICER.

British Medical Association

PROCEEDINGS OF COUNCIL

WEDNESDAY, DECEMBER 11, 1940

A meeting of the Council of the Association was held at B.M.A. House, Tavistock Square, London, on December 11. Mr. H. S. Souttar, Chairman of Council, presided, and there were also present:

Dr. J. W. Bone (Treasurer), Dr. Peter Macdonald (Deputy Chairman of Representative Body), Mr. N. Bishop Harman (Immediate Past Treasurer), Mr. E. R. Bhodes, Prof. A. H. Burgess, Mr. V. Zachary Cope, Mr. W. McAdam Eccles, Dr. F. W. Grant, Dr. E. Gray, Dr. E. A. Gre[illegible], Colonel W. L. Harnett, I.M.S. (ret.), Dr. W. Irvine, M[illegible] Dr. Lolley, Sir Ewen Maclean, Dr. O. Marriott, Dr. J. C. Matthews, Dr. H. B. Morgan, Mr. R. L. Newell, D[illegible] W. Paterson, Prof. R. M. F. Picken, Colonel A. H. Proctor, Dr. H. R. Robinson, Dr. E. A. Roper, Dr. W. I. Thomas, Dr. S. W[illegible] M[illegible] N. E. Waterfield, Dr. W. N. West-Watson.

The Chairman referred with regret to the deaths since the last meeting of several former members of Council and of two sitting members, Dr. J. R. Prytherch and Dr. F. H. Snell. Among the former members who had died was a Past-President of the Association, Dr. F. G. Thomson of Bath.

The Chairman said that the Council would be sorry to hear of the illness of the Editor, who was likely to be absent from his duties for some time. On his suggestion a message of sympathy was sent to him from the Council.

The Council nominated the Association representatives on the Central Medical War Committee, and in order to make the representation of general practice more adequate added the names of Dr. F. Gray of Wandsworth, Dr. J. M. Johnstone of Stoke-upon-Trent, and Dr. F. W. Grant of Newcastle. Certain nominations for the Scottish Medical War Committee were also approved, it being left to the Scottish Committee at a future meeting to nominate further names.

Medical Planning Commission

The Chairman of Council said that he had suggested to the Executive Committee that the time had come for the profession to give serious consideration to the problem of reconstruction and reorganization in the field of medicine in the post-war era, and the committee had thereupon decided to appoint a B.M.A. Medical Planning Commission to study wartime developments and their effects on the country's medical services both present and future. A large and representative body was in process of appointment which would consist ultimately of about seventy individuals. The English Royal Colleges and the Scottish Royal Corporations have been invited to co-operate. The Society of Medical Officers of Health, so long associated with the medico-political work of the Association, will also assist the Commission through its accredited representatives. The detailed work of the Commission would be undertaken in committees and subcommittees, and the Commission itself would meet only perhaps three times a year to debate larger questions of principle. Correspondence had taken place with the Royal Colleges on the subject, and on the previous day the Comitia of the Royal College of Physicians had accepted the invitation to send representatives and to co-operate fully in the work of the Commission and its committees, and it was believed that the Royal College of Surgeons and the Royal College of Obstetricians and Gynaecologists, which had favourably received the invitation, would also send representatives.

The proposals of the Executive Committee were approved.

Medical Supervision at Air-raid Shelters

The Executive Committee reported on the scale of payment which had been agreed with the Ministry of Health for medical supervision and attendance at public air-raid shelters and emergency rest shelters. The Secretary explained that the proposed payment of salary at the rate of £500 a year for the doctor who was required to stay on duty at the shelter during the whole night related to not more than a dozen shelters in the whole of London, each shelter perhaps accommodating 2,000 or 3,000 people; the scale of payment more usually in force of one guinea a night was for a nightly visit to a shelter or group of shelters and for remaining on call at any time during the night hours.

Dr. Wand raised the whole question of the shelter medical service and related problems. He said that correspondence in recent numbers of the *Journal* had suggested that the Association had not taken a strong enough line in regard to many of the problems now coming forward, including shelter provision, bombed civilians, and the needs of refugees. The general practitioner as represented by the Association had never been consulted on matters of which he knew more than any other group in the profession. On the Horder Committee there was no general practitioner, and the findings of that committee with regard to health measures in the shelters were not strictly in accord with the views which many general practitioners held. Had the Executive Committee ever suggested that the Association should play a part in the work of such committees, or had representative general practitioners with experience of these problems ever been approached in order that their views might be elicited and brought to the notice of those in authority? The members of such committees seemed to be generally consultants or medical officers of health or other people who spent most of their time organizing from their desks with very little experience of the actual problem.

Professor Picken said that Dr. Wand apparently thought that the Association ought to have foreseen the position which had arisen with regard to the shelters, but he had not heard Dr. Wand or anyone else predict the situation whereby in this winter of 1940 many thousands of people would make the shelters their dormitories. If the profession had been able to anticipate such a situation it would have been guilty indeed had it not taken the necessary steps. When the thing did happen the Government was placed in an extremely difficult position and had to act as quickly as possible. It appointed the committee under Lord Horder's chairmanship, which, however, included no general practitioner nor any representative of the public health medical services actively working at this problem in the field. So far as the Association was concerned, the *Journal* was its very important instrument, and great prominence to this subject had been given in its pages and very explicit suggestions made. He thought that one of the most important things the Association could do was to publish information through its *Journal*. To try by ordinary committee methods to deal with this emergency problem would be quite futile. With regard to the health of the people in the air-raid shelters, the big problem seemed to him to be air-borne infection.

Dr. Wand replied that the shelter problem was only one of several in which there had been a like neglect. He could not claim to have visualized the present situation, but nearly twelve months ago he had written a letter advocating that there should be some body in the profession which would have the ear of the Government and bring to its attention such points from time to time.

Dr. F. Gray said that the Ministry of Health's circular envisaged a doctor making a nightly round of many shelters and also spoke of frequent and regular visitation by the medical officer of health. He suggested that the doctor making the nightly round could be of the greatest assistance to the medical officer of health in reporting on the health conditions, and it was to be regretted that the circular made no provision for such co-operation. In Wandsworth twenty-four medical men were making a round of shelters and, entirely unofficially, were furnishing a report on the health conditions.

The Chairman closed the discussion by saying that the Association was in constant contact with the Ministry of Health on the many medical problems arising out of war conditions.

Ophthalmic Hospital Clinics

Mr. Bishop Harman reported further on the question of the establishment by the Central London Ophthalmic Hospital of two branch out-patient departments in the London suburbs, a matter which has aroused a great deal of controversy. The council of management of the hospital had previously announced, following representations by the Association, its decision to discontinue these clinics, but it now urged that the altered conditions occasioned by the bombing of London and the difficulty of access of patients from the outskirts to the centre made it desirable to reverse this policy. A meeting of representatives of the hospital and of the Association, under the chairmanship of Sir Arthur MacNalty, formerly principal medical officer to the Ministry of Health, had recently taken place. Mr. Bishop Harman pointed out that in the districts concerned there were three first-class general hospitals with thoroughly good out-patient departments, plenty of practitioners whose names were on the N.O.T.B. list, and a number of ophthalmic surgeons practising. He understood that all but a very small minority of the medical staff of the hospital itself were opposed to the scheme. If it were allowed to proceed as a war concession it would be exceedingly difficult to get rid of it after the war.

Another member of Council considered that the difficulty of patients getting access to the centre had been exaggerated. Most of the central London hospitals were keeping on their out-patient departments.

On the proposition of Mr. Bishop Harman, seconded by Dr. Henry Robinson, the Council unanimously decided to adhere to its previous decision of April 10, declaring that such action by the hospital authority was contrary to the public interest and to medical ethics and presented grave professional risks to the medical staff of such clinics, and urging the hospital to discontinue them.

Co-operation with Government Departments

It was reported that the Association, on behalf of the profession of the country, had offered its services for the free medical attendance in first-aid treatment of battle casualties or injuries sustained by members of the Home Guard whilst on duty. The Army Council had expressed very great appreciation of this offer, "which accords so fully with the spirit in which the Home Guard was conceived." The Chairman said that the Executive Committee had felt it to be reasonable for the profession to attend free of charge those who were injured on duty whilst giving their services freely to their country.

In view of the development and expansion of the factory medical service at the instance of the Minister of Labour, the Association had offered to Mr. Ernest Bevin its warmest co-operation in the consideration of all problems affecting the health of factory workers.

Various Committee Business

Professor Picken, for the Public Health Executive Committee, reported that the committee had viewed with some anxiety the policy suggested in one of the circulars issued by the Ministry of Health to welfare authorities in connexion with the national milk scheme, inasmuch as it would appear to encourage local authorities to undertake to a greater extent than formerly the distribution of dried milk. The committee had made representations to the Ministry urging that the arrangements for the distribution of dried milk under the scheme, which were not subject to medical supervision, should be administered separately from the arrangements for the issue of dried milk at local authority welfare and maternity centres, which are subject to medical supervision.

Dr. E. A. Gregg, chairman of the Insurance Acts Executive Committee, reported that for a considerable time the question of rising costs in relation to the insurance capitation fee had been under consideration and experts' reports on changes in the cost of living, motoring, and practice expenses had been obtained from time to time. His committee had decided that there was justification for an application for a wartime increase in the capitation fee on the grounds of increased practice expenses and cost of living, and it proposed now to make such an application. The committee had also decided to apply for an increase in the mileage grant on account of the substantial rise in motoring costs.

The Treasurer (Dr. Bone) reported that the financial position of the Association was good, but he reminded the Council of the serious liabilities involved in the building scheme. He was able to announce, however, that a large part of the new northern extension had been rented at scheduled rates. The southern block, which was not completed, had been secured against the weather and made as safe as possible. It was mentioned that in one of the raids on London the presence of mind of the caretaker, Mr. Woodcock, saved the Great Hall probably from destruction when it was hit by an incendiary bomb. Dr. Matthews, for the Organization Committee, stated that 92 medical men were prisoners of war in Germany, 60 of whom were members of the Association. It was proposed to waive their subscriptions during their period of captivity and also if possible to send them copies of the *Journal*.

The meeting of the Council occupied two hours.

Assurance for Doctors

The War Damage Bill, which has been presented to Parliament, provides for compulsory insurance of buildings through the revenue authorities, and voluntary insurance of goods and chattels through Lloyds' underwriters and the insurance companies. The Bill is long and complicated, and it is likely that there will be amendments. The Medical Insurance Agency is closely watching the situation and hopes to make an announcement in the *Supplement* on the subject as soon as full information is available.

WEEKLY POSTGRADUATE DIARY

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.—*Royal National Orthopaedic Hospital*, Stanmore.—Sat., 2.30 p.m.; Final F.R.C.S. Clinical Orthopaedic Course. *Medical Society of London*, 11, Chandos Street, W.—Wed., 2.30 p.m., Final F.R.C.S. Theoretical Orthopaedic Course. *Royal Cancer Hospital*, Fulham Road, S.W.—Daily, 9.30 a.m. to 1 p.m., Final F.R.C.S. Comprehensive Course; Thrice weekly, 2 p.m., Final F.R.C.S. Operative Surgery Course.

DIARY OF SOCIETIES AND LECTURES

ROYAL SOCIETY OF MEDICINE

Section of History of Medicine.—Wed., 2.30 p.m. Papers by Sir Walter Langdon-Brown: David Hartley; Dr J. F. Halls Dally: The Life and Times of Jean Nicolas Convisart (1755-1821).

Section of Surgery.—Wed., 2.30 p.m. Paper by Prof. S. Zuckerman: The Problems of Blast Injuries.

VACANCIES

EXAMINING FACTORY SURGEONS.—The following vacant appointments are announced: Brixham (Devonshire); Berkhamsted (Hertfordshire); Liverpool, Garston (Lancashire). Applications to the Chief Inspector of Factories, Cleland House, Page Street, S.W.1, by January 7.

MEDICAL REFEREE UNDER THE WORKMEN'S COMPENSATION ACT, 1925, FOR DERMATOLOGICAL CASES arising in the County Court Districts of Doncaster, East Retford, Mansfield, Newark, Nottingham and Worksop (Circuit No. 18), and Alfreton, Buxton and New Mills, Chesterfield, Ashbourne, Bakewell, Burton-on-Trent, Derby and Long Eaton, Ilkeston, Matlock and Wirksworth (Circuit No. 19). Applications to the Under Secretary of State (Industrial Division), Home Office, Cleland House, Page Street, S.W.1, by January 11.

APPOINTMENTS

MEACHIM, G. L., M.B., Ch.B., Examining Factory Surgeon for the Matlock District (Derbyshire).

Diary of B.M.A. Central Meetings

JANUARY

9 Thurs. Journal Board, 2.15 p.m.

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

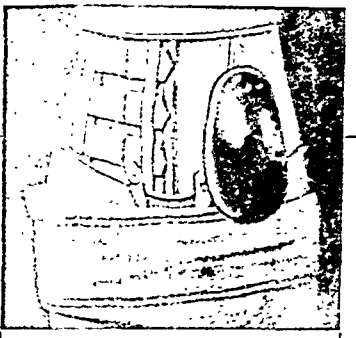
DEATH

HENDERSON.—On December 17, 1940, suddenly, at 59, Orchard Avenue, Parkstone, Dorset, William Savile Henderson, M.D.Liverp., B.Sc.Lond., aged 67.

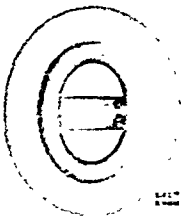
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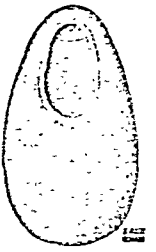


See groove over which aperture in bag is stretched and curved bridge to hold open mouth of bag.



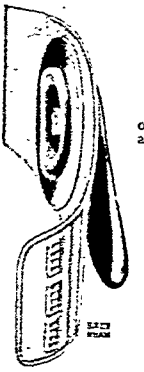
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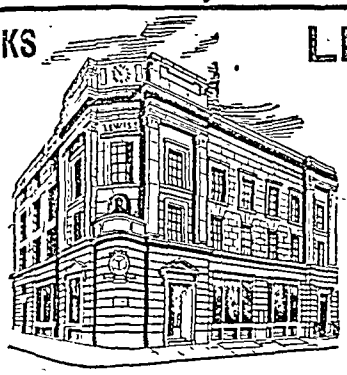
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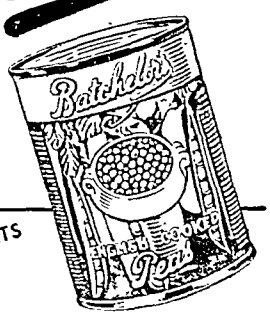
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 11 1941

PRIDE AND PREJUDICE IN THE TREATMENT OF CANCER*

BY

Sir ALFRED WEBB-JOHNSON, C.B.E., D.S.O., T.D., F.R.C.S., Hon. F.R.A.C.S., Hon. F.A.C.S.

Surgeon to Her Majesty Queen Mary, Vice-President of the Royal College of Surgeons; Surgeon to the Middlesex Hospital

(*Concluded from p. 51*)

The Throat

Cancer of the throat is one of the most dreaded and distressing of the manifestations of this disease, and never have the sufferings of the victims been so vividly described as they were by Kipling in his tragic poem *A Death Bed*:

> "This is a gland at the back of the jaw
> And an answering lump on the collar-bone."
>
> "It will follow the usual course of—throats"
>
> "Since it is rather too late for the knife
> All we can do is to mask the pain."

In studying cancer in this region it becomes clear that one is turning the pages of one of the most brilliant chapters of British surgical achievement.

The Larynx

Discussion of carcinoma of the larynx should be confined to intrinsic tumours, for the so-called extrinsic carcinoma is really cancer of the pharynx. In operative treatment the teachings of Sir Felix Semon and Sir Henry Butlin were brought to their highest standard of success by Sir StClair Thomson. He recorded 70 cases operated on by laryngo-fissure, with only 2 deaths as the result of operation (*British Medical Journal*, 1928, **1**, 743). Excluding those dying of other diseases, 38 out of 55 patients were alive and well from five to nineteen years after operation—a net five-year survival rate of 69%. This is exactly the same as the rate being attained at the Christie Hospital and Holt Radium Institute, where radium is used according to the Finzi-Harmer technique. This figure is arrived at, however, by a follow-up of only 16 cases treated in 1932 and 1933. But in the course of twenty-eight years StClair Thomson operated on only 70 cases, which shows that fortunately the larynx is not a common site for this disease. With these small numbers it is obvious that the problem in this situation does not lend itself well to statistical study, but the figures cited are significant. Other workers claim equal success by external radiation in spite of the barriers of skin and cartilage.

The results of radiation therapy are obtained with practically no disability or mutilation. But it does not do to exaggerate the change of voice produced by partial laryngectomy. A useful voice is preserved, and among StClair Thomson's patients were men who continued to follow professions such as schoolmaster and physician, while one was a parson who preached twice every Sunday. The pitfalls of radiation, such as overdose to skin and necrosis of cartilage, have been largely overcome.

The brilliant results from partial laryngectomy by thyrotomy or laryngo-fissure only emphasize the limitations of operative treatment, for any more extensive operation entails serious mutilation and disability. When only total laryngectomy can be offered by surgery the radiotherapist can often retrieve what looks like an absolutely hopeless position, and in the more active and advanced lesions radiation may be of great value when surgical procedures have little to offer.

The Pharynx

In the case of the pharynx most statistical returns do not distinguish between different types of tumour or even give their exact situation. Reports on end-results in cancer of the pharynx must first of all supply figures for each anatomical site. This would give *some* indication of the nature of the tumour, but it is not enough. The character of the tumour and the histological grading must also be ascertained and recorded, not only for statistical review but also to determine the best line of treatment. The site of origin and the character of the lesion are more important than the extent. The size of the growth is no criterion. A small tumour may lead to disappointment, while a large one may react in a most favourable way. Carcinoma of the tonsil can be cured even if large glandular metastases are present, but quite a small lesion of the anterior pillar of the fauces or the pyriform fossa may be incurable.

Since the tumours range from lympho-epithelioma to hard, warty, localized growths there is a great difference in their radiosensitivity. Exact details of the site and character of the growth are essential, and without these details statistics are valueless. But though we have not these details or statistical proof to guide us in regard to cancer of the pharynx we do know that tumours of the nasopharynx, the valleculae, the pyriform fossa, the deep pharynx, and the base of the tongue can often be made to disappear in a most remarkable manner by radiotherapy. Some of the results of radium beam therapy are most encouraging, but it may be that deep *x* rays can accomplish as much.

In tumours of the hypopharynx, essentially a disease of women about the menopause, an important consideration

* The Bradshaw Lecture delivered before the Royal College of Surgeons of England on November 27, 1940.

is the possibility of prevention. The Plummer-Vinson syndrome may or may not be the direct cause of tumours of the hypopharynx and it may occur without anaemia, but, as Witts has pointed out, the anaemia which is very common in women suffering from these tumours is due to iron deficiency and can be cured by the administration of iron, which not only repairs the anaemia but also restores the epithelium. The cracks at the corners of the mouth heal, the tongue is reclothed with papillae, the epithelium of the pharynx becomes more normal, and dysphagia is relieved.

The Oesophagus

Treatment of carcinoma of the oesophagus by surgery or by radiation has been disappointing, though there have been brilliant isolated successes. The tumour is of the same histological type as carcinoma of the cervix uteri. But here, unfortunately, we are dealing with a canal with thin walls which is immediately surrounded by vital structures. The growth is nearly always infiltrating the wall of the oesophagus when first diagnosed. The tumour is very sensitive to radiation, and its rapid destruction as the result of direct radium treatment often leads to perforation. External methods of radiation are therefore being more assiduously tried. There have, however, been no lasting cures by radiation in proved cases: reports in the literature refer to cases without histological proof and with inadequate periods of observation after treatment. There are some encouraging cases, but many disasters have occurred from serious changes in the lung. It is to be hoped that with further developments in technique greater success will be achieved.

Surgical excision has been attended with a few successes in the hands of bold operators, particularly in cases in the cervical portion and the lowest part, even with preservation of the channel. A few successes have been achieved also after removal of the middle portion. Garlock of New York (*Surg. Gynec. Obstet.*, 1940, **70**, 556) has reported 7 cases, in 6 of which the patient survived the radical operation. Four are still well—one of them two years and eleven months after operation. In Torek's historic case of transthoracic excision the subject lived for thirteen years and died of old age without recurrence. Grey Turner had one successful case, but the patient died of nephritis nineteen months afterwards. Lately Wookey (*Brit. J. Surg.*, 1940, **27**, 696) reported 4 cases of transthoracic removal, in 3 of which he adopted a new technique by approaching through the right side of the chest with ligature of the vena azygos major.

Grey Turner, who dealt fully with this subject in his Bradshaw Lecture of 1935, advises that if the history is short and there is no evidence of secondaries, and if improvement is rapid after a gastrostomy, radical operation should be considered. But our real hopes for the future lie in finding some method by which radiation can be brought safely to bear on this perilous region. The growth itself is vulnerable to attack, but a way must be found to protect the vital parts in the immediate neighbourhood.

Except as a preliminary to radical excision gastrostomy is now seldom required. By the method of intubation introduced by Charters Symonds and so ingeniously improved and applied by Souttar we can bring relief and comfort to and prolong the life of sufferers from oesophageal cancer

The Rectum

Surgical treatment of carcinoma of the rectum, based on the scientific work of Ernest Miles, may attain an 85% five-year freedom rate in Stage A cases, and between 40% and 50% in all cases (Gabriel). For many years efforts have been made to treat the disease in this situation by radiation therapy. Unfortunately the rectal mucous membrane is generally just as radiosensitive as the tumour. Gordon-Watson endeavoured to treat the condition with radium and did pioneer work on the surgery of access, but, as he stated in his Bradshaw Lecture of 1937 (*Lancet*, 1938, **1**, 239), he came to the conclusion that "although brilliant results were obtained in a small proportion of operable cases, the results were too uncertain to justify its use in an operable case with our present knowledge, except when a radical operation is contraindicated on general grounds." He has also reported, however, that although it was only in a small proportion, he had in several instances reduced fixed inoperable cases to a state of complete quiescence, if not cure, and that some of these patients remained in good health for periods ranging from seven to ten years (*Proc. roy. Soc. Med.*, 1935, **28**, 1251). The rare radiotherapeutic successes may be in cases of an undifferentiated type.

Serious efforts are being made to treat the condition by external radiation not only with the usual 200 kV machines but with large radium bombs and *x*-ray plants working up to a million volts. Ralph Phillips has treated a few cases by the latter method at St. Bartholomew's Hospital, and among them he showed me the notes of a patient aged 41 in whom an inoperable growth has been made to disappear and, two years after the treatment was begun, the colostomy has been closed.

The Uterine Cervix

In cancer of the uterine cervix the best British results from operative treatment are those attained by Victor Bonney, whose pioneer work with Comyns Berkeley laid the foundations, in this country, of the sound surgical treatment of that condition. Table II provides a fair basis for comparison between Bonney's five-year figures and those of the Marie Curie Hospital, where the best results have been attained by radiation treatment.

TABLE II

Victor Bonney: Cases operated on up to the end of 1928

Stage	No. of Cases	Gross Five-year Survival Rate
I	212 (no glands)	109 (51.4%) } = 38.8%
II	154 (with glands)	33 (21.4%) }
III		
IV	0	Inoperable

(*Transactions of the Medical Society of London*, 1934, 57, 196)

Marie Curie Hospital: Cases treated 1925 to 1933

Stage	No. of Cases	Gross Five-year Survival Rate
I	40	34 (85%) } 65.7% } = 42.6%
II	170	104 (61.1%) }
III	459	147 (32%)
IV	133	11 (8.2%) Inoperable
Total	802	296 (36.9%)

(Medical Research Council Report No. 236, 1939.)

The operation cases have not been separated into stages on the lines of the League of Nations classification, but if Stages I and II are counted as definitely operable radiotherapy is immensely better than surgical treatment, and even if Stage III cases are included among the operable ones, which is giving a distinct advantage to surgery in the calculation, the table still shows that better results are obtained by radiotherapy.

It is stated that 10% of all recurrences develop after the fifth year, and that therefore only ten-year survival rates should be accepted for a true assessment of results.

Table III shows a comparison of the ten-year survival rates, and again the advantage is slightly in favour of treatment by radiation, although the cases date back to a time when the technique was not as good as it is to-day.

TABLE III

Victor Bonney: Cases operated on up to the end of 1923

Stage	No. of Cases	Gross Ten-year Survival Rate
I	156 (no glands)	61 (39.1%) } = 30%
II, III (with glands)	110	19 (17.2%) }
IV	0	Inoperable

(*Transactions of the Medical Society of London*, 1934, 57 195.)

Marie Curie Hospital: Cases treated 1925 (3 Months) to 1928

Stage	No. of Cases	Gross Ten-year Survival Rate
I	10	8 (80%) } = 48.9% } = 30.4%
II	37	15 (40.5%)
III	124	29 (23.3%)
IV	45	2 (4.4%) Inoperable
Total	216	54 (25%)

(Medical Research Council Report No. 236, 1939.)

The results obtained at the Marie Curie Hospital are so good that they naturally stimulate inquiry. It has been said that a large number of the patients are nulliparous women and that maybe some cases were not carcinoma. I found the proportion of nulliparae to be 12%—8% being married and 4% unmarried. This would strike the old teachers of gynaecology as unduly high, but I do not consider it so in a hospital staffed by women, for at a general hospital like the Middlesex, taking the cases for 1936, 1937, and 1938, there were 11 nulliparae among 118 patients with carcinoma of the cervix, or 9.2%, and 4 of the patients were unmarried. It is said that a large proportion of early cases go to the Marie Curie Hospital, but in actual fact the proportion of Stages I and II cases is very low. It is also said that maybe this hospital receives selected cases only, because several unsuitable cases are not sent for treatment; but I am informed that *all* cases seen by the surgeons at their other hospitals are referred to the Marie Curie Hospital for radium treatment, with the sole exception of the Royal Free Hospital, from which *every* third case is referred. The success of the hospital is really due to the following factors. It is very well equipped, the staff is extremely expert, and there is a large personnel; but the most important factor of all is that the most meticulous care is taken in carrying out the treatment, in following exactly the selected technique, and in making every effort to improve the local and general condition of the patient before radiation treatment is undertaken. Comparable results are obtained at other first-class radiotherapy centres, and the figures in Table IV of a general hospital like the Middlesex, with a large radiotherapy department, are also interesting. All the cases were seen first by the gynaecologists, and it may fairly be assumed that Bonney and his junior colleagues, both of whom were his pupils, would have a predilection for operative treatment unless there was some local or general contra-indication.

TABLE IV.—*The Middlesex Hospital, January 1, 1932, to June 30, 1935*

A: Operation Results

Stage	No. of Cases	Gross Five-year Survival Rate
I (no glands)	39	16 (41.0%) } = 38.4%
II, III (with glands)	13	4 (30.7%) }
IV	0	Inoperable

B: Radiotherapy Results

Stage	No. of Cases	Gross Five-year Survival Rate
I	9	6 (66.6%) } = 44% } = 34.9%
II	16	5 (31.2%) }
III	38	11 (28.9%) }
IV	35	3 (8.5%) Inoperable
Total	98	25 (25.5%)

The numbers are not large enough for statistical study, but they are distinctly significant. In Stage I and II cases the radiotherapy results are better, but when Stage III cases are included as operable the percentage advantage is with surgery. But only one-quarter of the radiotherapy cases were Stage I and II and less than a half when Stage IV cases are excluded, whereas three-quarters of the operation cases were Stage I. Moreover, the radiotherapy cases included 4 of palliative *x*-ray treatment and 5 treated by radium only and judged to be unfit for the full course; while 14, with only 1 five-year survivor, were treated before the Paris technique was adopted.

The operative mortality still remains in the neighbourhood of 10%, to which Bonney reduced it in favourable cases. The dangers of radiotherapy, which at first were a serious consideration, have been so mastered that at the Marie Curie Hospital only 2 cases of fistula have been seen in the last 700 cases.

Study of the available figures leads to the conclusion that better results can be obtained by radiotherapy than by operation in cases of carcinoma of the uterine cervix.

As a final consideration it is well to bear in mind that the radical operation for carcinoma of the cervix is one of great difficulty and that few can attain the results of Bonney and his colleagues. Radiation treatment, on the other hand, can be copied with meticulous care, and, provided the staff and equipment are adequate, good results should be attainable in many centres. Some cases do not respond to radiotherapy. They should be submitted to operation without delay, and they serve to emphasize that the course of safety is for surgeon and radiologist to work together.

The Breast

Consideration of cancer of the breast naturally calls to mind, among men of our time, the names of three of the seven Walker Prizemen of our College—Harold Stiles, Sampson Handley, and Lenthal Cheatle—who have devoted a large part of their lives to the study of this condition. The results of operation in Stage I cases are excellent. In the thorough and capable hands of Gordon-Taylor an 84% ten-year survival rate has been attained in cases traced from ten to twenty-five years. In more advanced cases, however, the results are most disappointing, and it is terrible to reflect that if the axillary glands are involved over 60% of our patients die of the disease within five years of operation.

In order to avoid the mutilation from which patients naturally recoil efforts have been made to ascertain whether radiation could safely be recommended as a substitute for surgery in Stage I cases, but the results achieved do not justify such a course. Keynes's efforts to attain by radium implantation results comparable to surgery were a real contribution to technique, but they revealed the limitations of radium implants with their localized action. The area to be dealt with is very extensive, and Keynes himself has realized that external radiation has advantages over implantation.

When considering reports of favourable results from external radiation alone it must be remembered that the recorded cases are few, that as a rule the diagnosis is not

proved by pathological investigation, and that in early cases there is no unequivocal sign which will enable the clinician to make a diagnosis with absolute certainty. Nevertheless there is no doubt that successful results can be obtained, and if operation is refused or contraindicated radiation treatment is justified in Stage I cases.

In seeking for assistance from radiation therapy while still practising surgical excision, attempts have been made by pre-operative or post-operative, or by pre-operative *and* post-operative radiation to reinforce the attack on the disease. In favour of pre-operative radiation it may be said that it demonstrates which cases are radiosensitive, and these are just the ones in which radical surgery is likely to fail. It also decreases the vitality of the cancer cells previous to operative disturbance. It may interfere with healing, but this is minimized by proceeding to operation directly the pre-operative course is completed. In regard to post-operative radiation, it has to be remembered that after operation the tissues will not stand a full dose owing to the surgical trauma and the impaired blood supply; and nothing less than the full dose is likely to be really effective. Figures from some centres indicate that a combination of pre-operative and post-operative treatment may be the best.

The view is held by some that radiation alone may be the best treatment in Stage II and Stage III cases. In its favour it is argued that a full dose of radiation can be given without interruption, and that the radical operation is often dangerous, as it involves the risk of cutting into cancerous tissue in the axilla. But we have no convincing statistics to prove that the results of radiation are better than those of operation. Mass statistics, with percentages often based on an insufficient number of cases, are quoted in support of radiation treatment, and even averages of percentages (a most fallacious use of statistics) are marshalled in further support. Our experience at the Middlesex Hospital would not permit us to subscribe to this view.

It may be that we have had enough of statistics based on large series of cases treated on certain definite lines and that what is required is that each case should be treated in the way which appears best after considering all the circumstances. We may thus ascertain whether, with the exercise of judgment, the gross results can be improved, and then, by analysis of those results, find out which treatment is best for each class of case.

Our accumulated experience seems to me to justify us in regarding each case at the outset as a radio-surgical problem, and then proceeding as follows:

In a *clinical Stage I* case give a short intensive course of radiation. If the tumour shows signs of disappearing rapidly it is very radiosensitive and likely to be unpromising for surgery. Radiation should therefore be continued. If the response to radiation is not very striking, then radical operation should be undertaken immediately after about a third of the full dose has been given. The specimen should be examined with meticulous care, and further procedure planned on the two alternative results of the investigation: (1) if there is no evidence of extension to the glands the case is pathologically proved to be Stage I, and no further radiation is indicated; (2) if, on the other hand, the glands are found to be involved the case is pathologically Stage II, and the course of radiation should be completed. Some of the 60%. of failures after radical operation in Stage II cases might be saved by this post-operative completion of the radiation course.

If the case is *clinically Stage II or Stage III* radiation treatment is definitely indicated at the outset. A good response would encourage continuance of radiation, for on biological grounds the case is probably unsuitable for operation. If, on the other hand the response is not good, or there is a residual lump, the breast should be removed without opening the axilla. Radiation treatment should be completed after operation, for glandular deposits are more constantly made to disappear than the primary growth. The risk of disseminating the disease that is involved in clearing the cancerous contents of the axilla would be avoided by this procedure.

Finally, there is no question of the good that radiotherapy does in some advanced cases in this and other situations and also in the case of some metastases, but it must be admitted that in others it only adds to the patients' sufferings. Radiotherapists should therefore never be pressed to give treatment as a placebo or in cases that are obviously hopeless.

The Cancer Act

From a study of the present position of cancer treatment certain points are clear: first, that about half the patients suffering from cancer need some form of radiation therapy; second, that this difficult work can only be undertaken satisfactorily under the most favourable conditions; and, third, that intensive research is required in every aspect of the cancer problem.

The first two requirements are not being met, for it is estimated that in this country only about a quarter of the sufferers obtain treatment of a skilled nature at hospitals adequately equipped and staffed, and that where diagnosis requires highly technical investigations the proportion is smaller. The Radium Commission made repeated and urgent representations that to secure a reasonable standard of service for the treatment of cancer cases throughout the country there was need for the Government to attack the whole problem along national lines. The Cancer Act is designed to achieve this object. By March, 1942, local authorities, co-operating if necessary with neighbouring authorities, have to submit schemes for the approval of the Ministry of Health, making arrangements to secure that the facilities for the treatment of persons suffering from cancer are adequate for the needs of the county or borough. We are therefore on the eve of a great development of regionalization of hospital services for this specific purpose, and those studying the question of regionalization will do well to bear in mind this particular need, for it may be found that the arrangement of localities necessary for the cancer service will be suitable for other purposes also. Under the provisions of the Cancer Act local authorities are empowered to make grants for extensions of voluntary hospitals and for the maintenance of those extensions. Those who fear for the future of the voluntary hospitals should note the words of Sir Arthur MacNalty, who, when Chief Medical Officer of the Ministry of Health, said that "only by co-operation in hospital services regionally and nationally will the difficulties of expense of voluntary hospitals be overcome and the voluntary principles of which this country is so proud be safeguarded."

Cancer Centres

In an explanatory circular issued to local authorities in May, 1939, it is explained that the provision of adequate facilities for cancer treatment means both by surgery and by radiotherapy, including treatment by radium and by deep *x* rays. This is satisfactory, for it makes it clear that the centres are to be Cancer Centres and not just Radium Centres. The Minister's view was expressed that treatment must necessarily be concentrated in those comparatively few hospitals which have on their staffs skilled radiotherapists and physicists as well as surgeons, which possess the requisite specialized departments, and which contain enough beds to keep the radiotherapeutic department, with its expensive equipment of radium and apparatus, fully employed. The Minister hoped that there would be full co-operation between the authorities and the voluntary

hospitals, and he enjoined that the hospitals which already hold supplies of radium and which otherwise possess adequate facilities should be utilized to the greatest possible extent.

The Minister pointed out that surgical operation still remains the only practicable, or the most suitable, form of treatment for a large proportion of cases, and that for this purpose it may be found necessary to make use of some hospitals in which radiation treatment is not available. He lays down the condition, however, that "where use is made of such a hospital a patient should be treated there only when it has been decided, after consultation between the appropriate specialists, that surgery without radiation is the proper form of treatment for the case." This applies to at least half the patients receiving treatment. Is such an instruction justified by the present state of our knowledge? And, if so, should not a similar consultation be required before radiation treatment is allowed? In point of fact it is certain that there are not enough experienced radiotherapists available for such consultations.

One of the most important matters to ensure the success of the scheme will be proper central control. It may be true that the Ministry is to appoint an expert advisory committee with representatives of medicine, surgery, gynaecology, radiotherapy, pathology, and public health, and that this expert committee dovetails with the Medical Advisory Committee of the Ministry, which includes the Presidents of the three Royal Colleges. Such Advisory Committees are often chosen but seldom called. The real work will be done by an executive body, and in my view that body will be best equipped for its task if it is made directly responsible for the management of a National Centre. It will then be in constant and immediate touch with those actively engaged in treatment and research. The National Cancer Centre would also be the appropriate place for the establishment of a central bureau for the collection and study of records.

The provision of adequate facilities for cancer treatment entails the establishment of several centres in addition to those already recognized as efficient, and it is estimated that at least a thousand additional beds will be needed. The establishment of hundreds of consultation centres for diagnosis and for the following up of patients will be required, and in this way the essential link between general practitioners and hospitals will be provided.

Each centre must be a fully equipped hospital or branch of a hospital specially devoted to this work. It must have plenty of beds, and it must have rooms for private patients. In the future, even more than in the present, treatment of this disease will have to be carried out in institutions, and all classes of the community must be eligible for admission. There must be an expert staff and every facility for diagnosis and treatment. There must be a full-time radiotherapeutic staff with at least two experienced members. There must be ample radium, so that all methods of application can be employed. There must be a generous equipment of *x*-ray apparatus, so that treatment and dosage can be prescribed and spread as the radiotherapist requires and not just meted out so that all who demand shall share in what is going. There must be a large staff, so that treatment can be supervised and cases carefully studied. There must be an expert surgical staff, carefully chosen for their special aptitude in diagnosis and operative skill in various regions. There must be well-staffed and well-equipped departments of pathology and physics. There must be well-paid posts for assistant members of the staff, and facilities for those undergoing training, so that there will be a plentiful supply of radiotherapists to fill senior posts as they fall vacant.

Medical Education and Research

When schemes are submitted for approval two aspects of the proposals will be of special concern to our College. One is that facilities for medical education shall be safeguarded, and the other that research shall be encouraged.

In regard to medical education, it must be remembered that, while the treatment of cancer may be very special work requiring much postgraduate study and experience, instruction in diagnosis together with the observation of the results of treatment is essential for the undergraduate. The success of a cancer service depends on early diagnosis, which depends in turn on the recognition of the significance of symptoms, and for this purpose the general practitioner is the first essential link in the chain. Every medical school, therefore, if not a treatment centre, must be a consultation centre for diagnosis and for observation after treatment.

In the Cancer Act no provision is made for research, but the treatment of cancer can be carried on efficiently only in a spirit and atmosphere of inquiry, and if any centres are planned without regard to the need for research the work at those centres will not be of the highest standard and they will fall behind in the effort to bring relief to sufferers from this disease.

In clinical research the records department will assume greater and greater importance, for more detailed returns will be required. Every case should have a record of the exact site, extent, and duration of the lesion, and there should be an agreed "staging" for all sites. The records should include *exact* details of the histology, and the tumour should be carefully graded. Uniformity in methods of making returns is essential.

Immediate Needs

The Cancer Act provides a splendid opportunity. Great hopes are founded on it, but their fulfilment will depend on the genius and foresight of those responsible for carrying out its provisions. Regional schemes cannot be formulated for some time, but there are two urgent needs which should be provided for without delay. As already mentioned, one urgent need is the formation of a central national authority to study the problem and guide local authorities; the other is provision for the training of personnel.

There is a serious shortage of trained personnel, and in my opinion those already experienced in this work should be released from the Services and those anxious and fitted to take up the practice of radiotherapy as a career should be reserved from mobilization.

To fit himself for a career as a radiotherapist a graduate first requires to attain the standard of one of the higher surgical qualifications. He needs at least twelve months' training at a recognized centre, and must obtain a special diploma in radiology and later the higher diploma of the Faculty. But the only training worth while is experience—like the apprenticeship served to medicine and surgery and several specialties. Postgraduate courses are useful for obtaining the hall-mark of a diploma, but responsibility under supervision is the real training. The trainee should therefore hold a resident post in a cancer department, and, before having independent charge of patients, he should serve for about three years in an appointment equivalent to that of a registrar or first assistant. It is obvious, therefore, that the junior posts must carry generous remuneration, that there must be good prospects of promotion, and that the higher positions must be equal to those in any other branch of the profession.

The director's post must carry the full status of a staff appointment. In university centres he should be given

professorial rank, and he should not be barred from private practice in the institution. This can easily be limited by the number of private beds at his disposal. The best men will get the best results, and they are entitled to their reward both in professional status and in income. However lavish may be the provision of armamentarium, in radiotherapy as in surgery it is "the man behind the gun" that counts.

Conclusion

It is twenty-three years since I had the honour of delivering a Hunterian Lecture in our College. That too was in wartime. On that occasion I told the story of the conquest of the hosts of death—of the taming of the typhoid group of organisms by protective inoculation. Many other diseases have been controlled and almost conquered in our time, and even during the last twenty years of peace. I have no doubt that cancer will be added to their number. The possibilities opened up by recent research increase our confidence in ultimate success.

But until many questions are answered and we are armed with full knowledge of the cause of this disease, and thus on the way to prevention, we have to face the task of giving the best treatment to relieve and, as I have shown, oft-times to cure. I hope I have said enough to show that in addition to proved and trusty means of treatment we have powerful new weapons with which to combat the disease: but they are powerful for evil as well as for good, and need skilled and experienced control. I have emphasized, therefore, that the training of more men and women to use these weapons should be undertaken without delay. It is obvious that in the future there must be closer co-operation between surgeons and radiologists if we are to do the best for our patients. Special tumour clinics should be arranged: teams should be carefully chosen and certain regions assigned to special surgeons. A competent team must include surgeon, radiologist, pathologist, and physicist. It is abundantly clear, therefore, that there is urgent need for far greater facilities and a large army of workers.

I have spoken of the sturdy heroic work which has been done in the past and of the successes which have been achieved, but in our College we are only too well aware of the gaps in our knowledge and of the colossal amount of research work still to be done.

"And here will I make an end, and if I have done well, and as is fitting the story, it is that which I desired"—not only because of the vital importance of the subject, but also because I wished to do honour to William Wood Bradshaw, by whose devoted widow this Lecture was founded. But whether I have done well or ill, I hope I shall be acquitted of ungraciousness if I observe that, greatly as I appreciate the honour done me, much of my Lecture goes to show that those who in the future may be disposed to make benefactions to our College will do a greater service to humanity and ensure a richer harvest from their gifts by providing endowments for research than by founding eponymous lectures to be delivered within its walls.

O Witt Mitchell and O. D. Chapman (*New York State J. Med.*, 1940, **40**, 1308) record thirty-eight cases of *Staphylococcus aureus* septicaemia in patients aged from 3 to 65. Thirty-one were males and seven females. Twenty cases were examples of cellulitis, boils, or carbuncles, and eighteen of osteomyelitis, which with three exceptions were all in children. Half the patients with cellulitis, boils, or carbuncles had primary lesions on the neck or face. Of the osteomyelitis cases the tibia was the first bone to be involved in nine and the femur in six. Fifteen of the patients with primary lesions and seven of the patients with osteomyelitis died.

A SURVEY OF NUTRITION AND DENTAL CARIES IN 120 LONDON ELEMENTARY SCHOOL CHILDREN

BY

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A radiological investigation to study growth in school children was being carried out at University College by the late Prof. Woollard and the late Dr. Matthew Young which necessitated the six-monthly examination of 200 elementary school children between the ages of 5 and 8 years. It was hoped that this investigation would throw some light on the problem of nutrition.

In addition to the taking of radiographs the children were weighed and measured (without shoes), and various other clinical notes were made. It seemed of interest, to complete the picture, to have some information on the condition of the teeth, so a quick examination was made, and the findings form the subject of this survey. The period covered was one year, during which they were examined three times, although only the first and third inspections are considered here. As usually happens in this kind of investigation the numbers of children available dwindled considerably by the end of the year. Those examined appeared to be in fairly good physical condition on the whole and most of them had had extra milk at school.

When making the dental examination the buccal surfaces of the teeth were first tested with a probe for structural defects as shown by varying degrees of roughness, pits, etc., and graded into four categories. The grading was, so far as the personal factor allowed, similar to that used by M. Mellanby. Perfect smoothness of surface was graded as normal or category 0; and to categories 1, 2, and 3 were allotted teeth showing slight, marked, and severe roughness and pitting. It must be emphasized, to avoid misunderstanding, that the types of defects referred to here are those first recognized by M. Mellanby (1923, 1927, 1934) and included by her under the heading of "hypoplasia"; they are much more common, though less obvious, than the generally recognized gross type and present a different microscopical structure. In a dental survey J. D. King (1940) distinguished between the two kinds by calling them "M-hypoplasia" and "G-hypoplasia" respectively, and whereas it has been proved by many observers (Mellanby, King, Hughlings Davies, etc.) that the former type is to be found associated with dental caries, there is some doubt as to whether any association exists between dental caries and G-hypoplasia—in fact, King could find no association between these two conditions in the children examined by him in the Island of Lewis.

Having graded the structure of the teeth, the amount of caries was then noted. Owing to lack of time it was not possible to explore every tooth thoroughly with the probe; the teeth were also in some cases very dirty, so that very early caries must have been overlooked. The carious teeth were graded roughly into three categories, according to the size of the carious area: caries 1 included teeth with cavities up to about the size of a large pin's head; caries 2 included those with cavities larger than grade 1 but involving less than a third of any one surface; and caries 3 included all teeth with cavities involving more than a third of one surface. This method is admittedly rough and the grading arbitrary, but it serves to give an indication of the amount of spread of caries over a period of time, and when assessing the amount of caries per mouth is much more satisfactory than giving a mere percentage of teeth carious, which makes no allowance at all for the size of the carious cavities.

The dental examination was made by me and the observations were taken down at dictation by a second person. A complete survey was first made of the mouth for structural defects, then a second round of the teeth was made to assess

caries, by which time the figure assigned to any particular tooth for M-hypoplasia had been forgotten; the two sets of findings should therefore be quite independent.

Structural Defects (M-hypoplasia)

An average hypoplasia figure was first calculated for each type of tooth to see how the structure compared one type with another (see Table I); this figure is obtained by adding up the marks allotted to all the individual teeth and then dividing by the total number of teeth.

In Table I the types of teeth were arranged in ascending order of the average hypoplasia figures at age 5; the

TABLE I

	Age 5 (34 Children)		Age 6 (55 Children)		Age 7 (32 Children)	
	Total No. of Teeth	Average Hypoplasia* Figure	Total No. of Teeth	Average Hypoplasia Figure	Total No. of Teeth	Average Hypoplasia Figure
Lower:						
Lateral incisors	64	0.23	81	0.26	22	0.32
Central ,,	59	0.27	30	0.53	14	0 29
Canines ,,	68	0.37	110	0.35	58	0.16
Upper:						
Canines ,,	67	0 42	108	0.75	61	0 49
Lateral incisors	64	0 66	89	1.09	40	0.63
Central ,,	59	0 85	57	1.04	26	0.58
Lower:						
1st molars ,,	53	1.02	65	0 89	38	0.82
2nd ,, ,,	56	1.55	62	1 47	35	1.26
Upper:						
1st molars ,,	63	1 60	85	1.55	40	1.20
2nd ,, ,,	68	1.69	91	1.77	50	1.68

* The term "hypoplasia" is used to cover all degrees of surface structural defects, from very slight to severe, of the type known as "M-hypoplasia."

figures for ages 6 and 7 were subsequently added, and were found to be in much the same order. The teeth showing the best structure are the lower incisors and canines, and the worst are the molars—the upper incisors and canines being intermediate. The earliest-formed teeth are therefore those which have the best structure.

It was desired to ascertain whether in these children any association existed between the quality of the structure of the teeth and the amount of caries present in them. Each individual tooth was considered in relation to the two conditions, and the resulting figures for all the teeth were arranged in the form of fourfold tables for incisors and canines together and for molars. Values for χ^2 and P were then obtained. It will be seen from Table II that all the values for P except one are less than 0.01 (the exception being 0.05 for molars at age 7), showing that such distributions would occur by chance less than once in 100 times (or 5 times in 100 for age 7 molars). A value of 0.05 is usually taken as the level of significance, all values of 0.05 or less indicating a real difference between observed values and such as might occur by chance. It is evident, therefore, that an association did exist in these children between the quality of the structure and the amount of dental caries—the better the structure the less the caries.

TABLE II.—*Association of Caries and Surface Structural Defects (M-hypoplasia) of Deciduous Teeth*

	Age 5 (34 Children)			Age 6 (55 Children)			Age 7 (32 Children)		
	χ^2	n	P	χ^2	n	P	χ^2	n	P
Incisors and canines	27.141	1	<0.01	58.181	1	<0.01	6.750	1	<0.01
1st and 2nd molars	24.450	1	<0 01	32.982	1	<0.01	4.532	1	0.05

Dental Caries and Nutrition

As already stated the chief point of interest in planning the main investigation was nutrition, and as it was desired to correlate the amount of dental caries present with the nutrition, it was necessary to assign a numerical value to both in every individual.

The difficulty in devising a value for the dental condition is that a figure based only on the teeth present in the mouth at the time of examination is obviously not truly representative of the dental condition of a child who has had a considerable number of teeth extracted for caries. Consider, for example, a child of 5 with only its non-carious incisors and canines left, all molars being missing: unless some allowance is made for the molars which will almost certainly have been extracted for caries at this age, the caries figure for this child will be exactly the same as that for one having a complete set of non-carious teeth. To overcome this difficulty, when assessing the caries *per mouth* it was assumed that in these children (aged 5 to 7 years) all canines and molars missing had been carious in the third grade, and adjustments were accordingly made in the caries figures. Incisors lost might have been carious, but at these ages they might have been shed normally, so no allowance could be made for them. (The age 5 group was the least affected by this consideration, most of the teeth being actually present in the mouth—see Table I—and age 7 the most affected; therefore, age 5 group would give the most satisfactory data.) The carious marks allotted to deciduous teeth in each mouth were added together, then divided by the total number of teeth; this gives an average caries figure which can be correlated with any other condition as required. (Deciduous teeth which were present in the mouth at the first inspection but were shed or extracted during the course of the year were nevertheless included when calculating the final average caries figures in order that the increase in caries might be assessed in the same number of teeth over the whole period.) No account was taken of any permanent teeth.

The assessment of nutrition is a subject on which there is little agreement from any point of view. Standards of good and bad nutrition vary from one clinician to another, and sometimes even for the same clinician variations may be found in the standards used over a period of time. Many factors are involved and much depends on the order in which children are seen, well-nourished ones tending to make less fit ones examined subsequently seem even worse than they probably are, and vice versa. In an effort to produce some standard less influenced by the personal factor, many indices of nutrition have been devised based on various physical measurements. R. Huws Jones (1938) described investigations carried out to test the value of a number of these indices in relation to clinical assessments of nutrition in the same children. It was found that a simple index based on weight/height agreed as closely as any of the more complicated indices with the clinical assessments; moreover, it did not show a greater variation from the latter than that which occurred in the clinical diagnoses of the same children made by different physicians.

In order, then, to obtain a numerical value to represent (however roughly) the state of nutrition in these children it was decided to use the formula:

$$\frac{100 \text{ weight in kg.}}{\text{height in cm.}}$$

Average caries figures and nutrition indices were calculated for the first inspection and again at the end of one year, as well as the differences in each over the whole period. The correlation coefficients obtained are shown in Table III.

TABLE III

	Age 5 (34 Children)	Age 6 (55 Children)	Age 7 (32 Children)
A.C.F. at 1st insp. with 100Wt./Ht. at 1st insp.	0.127±0.169	−0.075±0.135	0.154±0.175
Increase in A.C.F. with 100Wt./Ht. at 1st insp.	0.059±0.173	−0.106±0.135	−0.195±0.173
Increase in A.C.F. with 100Wt. Ht. at last insp.	−0.233±0.165	−0.133±0.135	−0.196±0.173
Increase in A.C.F. with increase in 100 Wt./Ht.	−0.483±0.136	−0.261±0.129	0.028±0.179

At age 5 there is a fairly high negative correlation (−0.483) between the increase in the average caries figure

and the increase in the nutrition figure; that is to say, the *greater* the increase in the nutrition index (indicative of improvement in nutrition) the *less* the increase in caries. At age 6 the same relation exists: the correlation figure is rather low (−0.261), but it is significant statistically, being more than twice its standard error. At age 7 no correlation was found between the two conditions, but, as explained, this group is not so satisfactory because many of the deciduous teeth were already shed.

No association existed between the amount of caries found at the first inspection and the weight/height index at that time. Again, when the increase in the average caries figures was correlated with the weight/height index at the first inspection and at the last, no association could be found between them at any age. This was perhaps to be expected, as these indices only give an indication of nutrition at the time when taken and are not necessarily representative of past physical conditions which may have helped to produce defective and carious teeth, whereas the difference found to occur in the nutrition indices over a period shows what change, if any, is taking place in the child's physique during that time and whether its increase in weight is keeping pace with its growth in stature. It is interesting, however, to note that eight out of the twelve correlation coefficients calculated are negative, showing that the trend is frequently in the same direction—i.e., the better the nutrition the less the onset and spread of caries.

Conclusion

To sum up, it has been shown that, owing to the fact that the nutrition of an individual may vary from time to time, it is extremely difficult to relate it to any other condition at any given period; the complete picture from birth onwards is required. With the knowledge now in our possession, however, it is possible to fit together some of the pieces in the dental picture. It has been shown conclusively in animals that good dental structure can be produced by dietary methods (Mellanby, 1929), and in the investigations carried out in Birmingham by the Dental Disease Committee of the Medical Research Council (1936) there were indications (nursery school) that the same was true for children. Good structure, making the teeth more resistant to disease, is, then, the first line of defence. Post-eruptive influences, though less strong, appear to provide secondary protection, but it is not known how they are exerted. In Birmingham (where the average age of the children was higher than in this series) it was shown that vitamin additions to the diet *before eruption* of the teeth had a definitely beneficial effect in reducing the amount of decay which developed, and also that these dietary additions, even when given after *full eruption*, tended to delay the onset and spread of caries in the permanent teeth. In extension of these findings the present survey would appear to suggest that even in children who have not received any special dietary treatment an improvement in general nutrition, as gauged by the weight/height index, is found in conjunction with increased resistance of the deciduous teeth to dental disease.

Summary

120 elementary school children were examined over a period of one year for dental caries and surface structural defects of the teeth. It was found that:

(1) The lower incisors and canines showed the best surface structure and the molars the worst, the upper incisors and canines being intermediate: the structurally soundest teeth are therefore those of which the greatest part is formed *in utero* before dietary deficiencies are normally felt by the child.

(2) A definite association existed between the quality of the structure of the teeth and the amount of caries present: the better the structure the greater the resistance to dental disease.

(3) An improvement in physical condition as judged by an increase in the nutrition (weight/height) index at ages 5 and 6 was found to be fairly strongly associated with a smaller increase in dental caries.

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ANAESTHESIA FOR MAJOR DENTAL SURGERY

AN ALTERNATIVE TO THE ENDOTRACHEAL METHOD

BY

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Pernasal endotracheal inhalation anaesthesia is now firmly established as a method of choice for major dental and oral surgery. It has, however, long been felt that in spite of the obvious advantages attached to the method the liability to trauma of the mouth and pharynx would make a simpler but equally satisfactory alternative desirable for major dental surgery. The oral surgeon expects his patient to be "well" soon after the operation is over, because both he and the public, with a certain amount of justification, do not regard the removal of an impacted wisdom tooth or a cosmetic dental operation, in an otherwise healthy person, sufficient reason for a convalescence of several days or more to recover from the effects of the anaesthesia or from the operations of the anaesthetist.

To obtain the minimum of post-anaesthetic sequelae the anaesthetist must avoid the deeper planes of anaesthesia—the first plane of the third stage is all that is necessary for this work; trauma to the mouth and pharynx; lipoid-soluble agents—nitrous-oxide–oxygen is still the most suitable one for the type of surgery involved.

Advantages and Disadvantages of Endotracheal Inhalation Anaesthesia

Before describing alternative methods the advantages and disadvantages of the endotracheal route will be briefly stated so that comparison may be made.

Advantages.—(1) A perfect airway is obtained which is not obstructed by altering the position of the head or by depression of the lower jaw. As a result the patient breathes quietly and without effort. (2) There is no danger of inspiration of blood, mucus, or operative debris, because the oral pharynx can be packed with gauze or an inflatable cuff round the tube can be used. (3) The mouth is left as a clear field for the surgeon to work in, with no anaesthetic apparatus to get in his way. (4) The anaesthetist is able to stand some distance away from the patient and still maintain efficient observation and control of the anaesthesia. (5) Post-operative vomiting is reduced, because if a lipoid-soluble agent has been used direct impregnation of the saliva during maintenance is reduced. (6) Air is easily excluded, enabling nitrous-oxide–oxygen to be used exclusively and without pressure.

Disadvantages.—(1) Under the light anaesthesia used for dental work considerable skill is necessary to pass the tubes blindly and without trauma into the trachea. (2) It is sometimes necessary to use ether or other lipoid-soluble agent to perform laryngoscopy if blind intubation is not successful. (3) There appears to be an increased liability to post-operative pulmonary complications (Dawkins, 1937). (4) The possibility of trauma to the mouth or throat (Gould, 1935; Clausen, 1932). From the patient's and also to a large extent from the surgeon's point of view the greatest disadvantage of the endotracheal method is the post-operative "sore throat" which sometimes results. Careful observation and questioning of 1,500 consecutive cases revealed that minor discomforts occurred more often than had been previously admitted. In all these cases great care had been taken to avoid rough handling, unclean tubes, dry gauze, and unnecessary instrumentation. In 15% the operation was outside the mouth (i.e., cases for which the operation *per se* could not be blamed). When carefully questioned on the day after operation nearly 10% of these patients complained of *some* symptom. This was usually trivial from a medical point of view, but was often distressing to the patient. The symptom was either "dryness of the back of the throat," "a tickling feeling over the soft palate," or definite soreness over the palate and back of the mouth. In some the symptoms were more severe, such as difficulty in swallowing and, in one case, hoarseness of voice. In all cases the symptoms cleared up in two or three days with simple palliative treatment or none at all. The cause of the faucial and palato-pharyngeal varieties of "sore throat" appeared to be abrasion of the mucous membrane by gauze packing or bruising by surgical instruments (retractors and suckers). The patient with the laryngitis was an adult whose operation for the removal of an impacted wisdom tooth lasted over two hours. Trauma, infection, or prolonged pressure of the catheter may have been the causal factor. Whatever precautions are taken it seems almost impossible to eliminate completely these "sore throats" in some cases.

Alternatives to the Endotracheal Method

To be satisfactory any alternative inhalation method must permit of the mouth or pharynx being efficiently packed. Nasal nitrous-oxide–oxygen can be used very successfully for dental operations lasting hours. Its disadvantages are: (1) The nose-piece is apt to get in the way of the surgeon, particularly in operations in the upper incisor region. (2) The pharynx cannot be packed, as the airway will be occluded, but packing can be placed around and under the tongue. This is efficient only if performed carefully and if a sucker is in use during the operation. (3) The surgeon must be gentle, so as not to disturb the nose-piece or pack. The method is thus unsuitable for the "heavy-handed" surgeon. (4) The method may be extravagant in gas, as pressures of 10 to 20 mm. Hg may have to be used in some cases to maintain nasal breathing. An intermittent-flow machine such as the McKesson is practically essential. (5) Full premedication must be used to obtain uniformly successful results. This is included as a disadvantage because, although I much favour nasal anaesthesia, many anaesthetists are chary of using the necessary premedication. (6) The airway is easily obstructed by the surgeon. Constant vigilance is necessary on the part of the anaesthetist, who usually has to support the lower jaw throughout the operation.

Nasopharyngeal Use of Nitrous Oxide and Oxygen

The use of pharyngeal tubes is not new. Silk (1919) described a nasal tube almost identical in size with those to be described later. His description of the method of its introduction can still be read with advantage. Silk intended his tube only as an alternative to an oral airway with an open-mask administration. Connell (1925) introduced nasopharyngeal *insufflation* of ether by twin nasal tubes, but the method is unsuitable for oral surgery as the pharynx cannot be packed. Pharyngeal *inhalation* anaesthesia with the pharynx packed was first described by Coburn (1921), who used a rubber tube covered with spiral wire and connected to a bag and expiratory valve. This tube was, however, passed through the mouth.

Nasopharyngeal inhalation of gas-and-oxygen has probably been used at some time or other by most anaesthetists. It has not been adopted as a routine procedure, and the following reasons may indicate some of the causes of dissatisfaction: (1) Usually only one nostril is intubated and air-leaks through the other are difficult to eliminate. (2) The diameter of the tubes used is usually too small to enable the patient to ventilate his lungs adequately. Nitrous-oxide–oxygen anaesthesia is difficult to maintain under these conditions without the use of pressure. (3) The tubes are usually too short, and are easily obstructed by the pack in the mouth or pharynx or by the position of the head. (4) The shortness of the tube makes an efficient pack almost impossible. (5) The use of ether becomes almost inevitable.

A technique has therefore been evolved in which two tubes of as large a bore as possible are passed, one through each nostril. The ends of these tubes lie just beyond the epiglottis and opposite the glottis. The tubes are then connected to a McKesson machine, and the pharynx or mouth is packed with gauze. A state of affairs is obtained which has the advantages of the endotracheal method without most of its disadvantages. The only causes of obstruction of the respiration, if the tubes are the correct length, are spasm of the glottis—a condition rarely seen with nitrous-oxide–oxygen anaesthesia—and depression of the jaw by the surgeon, which can usually be countered by the anaesthetist.

Description of Apparatus

Tubes.—By experiment and checking with laryngoscopic examination two average lengths were determined: for men, 6½ inches; for women, 5¾ inches. The tubing is that used for endotracheal work by Magill (the thin-walled variety) cut with a short bevel (45 degrees). The anaesthetist should be prepared to cut tubes for any individual patient. This will be particularly indicated in children and adolescents, for whom it is no use keeping standard lengths. The measuring is done by rapidly passing the lubricated tube through one nostril and listening at the open end. When the maximum tubular breathing is heard, but before the glottis is actually entered (a point

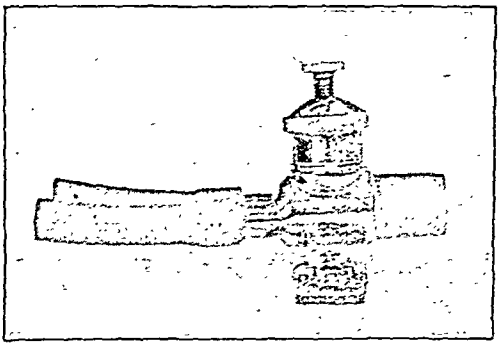


FIG. 1.—The apparatus.

easy to determine with practice), the tube is pinched close to the nostril, withdrawn, and cut.

Connexions.—Two right-angled Rowbotham connectors are used, one in each tube. The connexion to the McKesson machine is by a specially designed Y-piece which has the following features: (1) Each nasal arm is of wide bore (1 cm. internal diameter). (2) A plate covered with rubber to rest on the forehead. This keeps the nasal arms the correct distance away from the face and prevents marking the forehead by pressure of metal. (3) An expiratory valve incorporated in the Y-piece. This was suggested by Dr. de Caux, and avoids a multiplicity of small parts, making for simplicity in connecting up. (4) Two small studs for fastening the whole thing to the patient with an elastic band and avoiding the use of strapping. Fig. 1 shows the apparatus complete.

Technique

The patient is given the usual premedication (I use 2/3 grain of omnopon and 1/150 grain of scopolamine for a normal adult, with occasionally a small dose of evipan in bed). A number of tubes of suitable diameter and length are selected and placed ready, with their right-angled connexions inserted and their ends well lubricated with vaseline. Anaesthesia is induced with nitrous oxide, and when the patient is in deep third-stage anaesthesia the face-

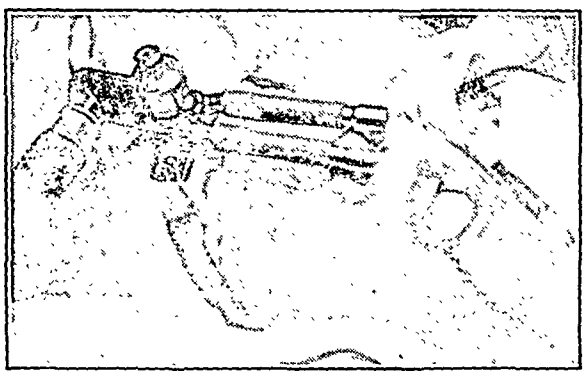


FIG. 2.—The apparatus in use.

piece is quickly lifted and one of the tubes of large diameter (8–10 Magill tube) is passed through whichever is the larger nostril. The tube should be inserted at right angles to the face and the point kept in contact with the floor and septal wall of the nasal fossa. The face-piece is replaced and the patient re-anaesthetized. The second tube is then inserted in like manner. As a rule the two sides of the nose differ in size, and a smaller tube will be used for the other side. The face-piece is discarded and the Y-piece connected up to the nasal tubes and to the McKesson machine (Fig. 2). The patient is now stabilized with oxygen, the pressure of the gases being increased, if necessary, to 10 to 15 mm. Hg to overcome air leakage through the mouth while the pack is inserted. As a rule the mouth can be easily opened at this stage, and the pharynx or mouth packed. If the jaw muscles remain tight secondary saturation may be performed or a little vinesthene added to the mixture. A dental prop should not be used from the start, because it will be found difficult to fit a face-piece over both the open mouth and the right-angled connectors protruding from the nostrils. The packing is of 2-inch ribbon gauze well wrung out in liquid paraffin. It should be carried back beyond the soft palate, so that air leakage does not take place round the tubes via the nares. As a rough guide the anaesthetist should pack in exactly the same way as for an endotracheal tube, but not quite so far back towards the glottis. An equally effective method, but one which is very often preferable, is to use a rectangular gamgee pad of about 3½ by 4½ inches, which is tucked around and under the tongue, reaching back to the fauces on each side. If this latter method is used a sucker is essential.

Results

Altogether 230 patients have been anaesthetized in this manner, the majority at the Royal Dental Hospital, for a variety of dental operations—mostly for impacted molars, dental cysts, and fractures of the mandible. From the surgeon's point of view they were all satisfactory, and in about half the cases he was not aware until after the operation that an endotracheal tube had not been used. Post-operative symptoms which could conceivably be due to the tubes were absent, except in two cases—in one there was an epistaxis twelve hours after operation, and in the other a "blocked nose" for two days. Both these might have been prevented by a more liberal use of vaseline on the tubes or perhaps by a little cocainization. In a few cases in which the jaws could not be opened easily a few breaths of vinyl ether overcame the difficulty. In no case was it necessary to use ether. With the exception of the two mentioned all the patients had completely recovered from the anaesthetic within twenty-four hours and were fit to go home if the local surgical condition allowed.

Contraindications

The method described above has its limitations. In my opinion it is not a satisfactory procedure in the following cases. (1) Large muscular men and patients with short fat necks: depression of the jaw by the surgeon easily obstructs the respiration, and holding the jaw forward to overcome this may be difficult or even impossible. (2) Children under the age of 5 years give better results with endotracheal anaesthesia. In one case adenoids were seen, through a laryngoscope, to obstruct the ends of the pharyngeal tubes. (3) If it is known or discovered that one or both sides of the nose are blocked an endotracheal method is indicated.

Summary of Conclusions

Although endotracheal anaesthesia has many advantages for major dental surgery the occurrence of post-operative sore throat in a number of cases should restrict its use to those in which it is indispensable.

Nasal gas-and-oxygen not being universally applicable, a nasopharyngeal method with the throat packed has been developed.

It has been satisfactory in use to both surgeon and anaesthetist.

It should not be used in patients in whom obstruction due to depression of the mandible is difficult to overcome or in young children.

My thanks are due to the honorary surgical staff of the Royal Dental Hospital for their patience and encouragement during the experimental stages of this study. The special Y-piece was made to my specification by Messrs. A. Charles King of 34, Devonshire Street, W.1.

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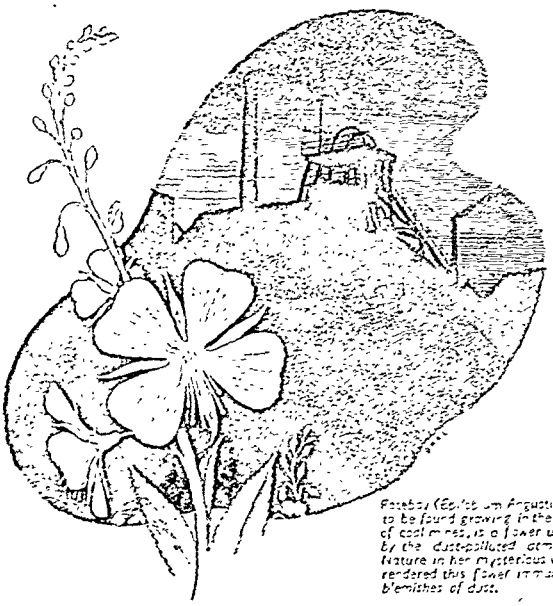
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Among some sixty students from abroad who are taking courses at Leeds University are five from Poland, one from Greece, and five from Germany. Most of the ten students from the British Dominons and Colonies are studying medicine.

IMMUNITY *from* INFECTION

"No aspect of medicine is more important at the present time than that of inducing or reinforcing resistance to infectious diseases".

Rep. med. Res. Counc. (1938-39) *Jam.* 1940, *p.* 25.



Fireweed (Epilobium angustifolium), to be found growing in the vicinity of coal mines, is a flower unsullied by the dust-polluted atmosphere. Nature in her mysterious way has rendered this flower immune from blemishes of dust.

IMMUNOLOGICAL PRODUCTS

Diphtheria Prophylactic Alum Precipitated Toxoid—A.P.T. (Evans).

Diphtheria Prophylactic Formol Toxoid—F.T. (Evans).

Diphtheria Prophylactic Toxoid Antitoxin Mixture—T.A.M. (Evans).

Diphtheria Prophylactic Toxoid Antitoxin Floccules—T.A.F. (Evans).

Diphtheria Prophylactic Toxoid (Alum Precipitated) with Whooping Cough Vaccine—D.W.P. (Evans).

Whooping Cough Vaccine (Evans).
" " " Fort (Evans).
" " " Mixed (Evans)

Tetanus Toxoid (Evans).

Typhoid Vaccine (Evans).
Typhoid-Paratyphoid Vaccine—T.A.B. Vaccine (Evans).

Anti-Typhoid Paratyphoid Vaccine with Tetanus Toxoid—T.A.B.T. (Evans).

Streptococcus Toxin (Scarlatina)—(Evans).

Adult Serum and Convalescent Serum. *Ampoulled on request.*

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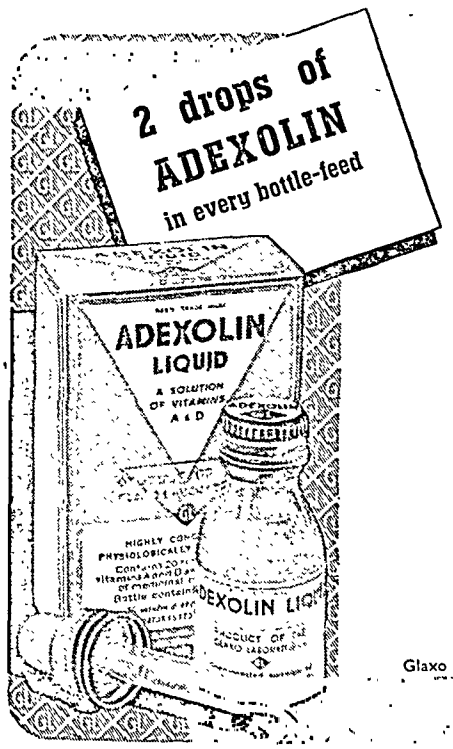
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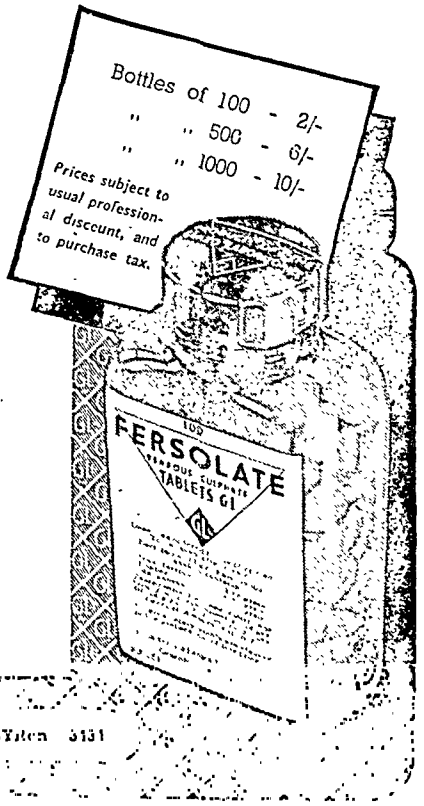
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OPTIMUM CALCIUM REQUIREMENT

BY

I. HARRIS, M.D.

Honorary Physician to the Liverpool Heart Hospital; Honorary Director of the Liverpool Institute of Research

J. T. IRELAND, B.Sc., A.I.C.

AND

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The serum of a normal adult is generally considered to contain 9 to 11.5 mg. of calcium per 100 c.cm. Table I gives the calcium determinations of 51 cases taken at random. The blood was examined soon after admission to the Liverpool Heart Hospital. We had no knowledge of the diet calcium of these patients. It will be seen that only in 4 cases out of 51 was the serum calcium below 9 mg.

TABLE I.—*Serum Calcium*

No.	Serum Ca mg./100 c.cm.	No.	Serum Ca mg./100 c.cm.	No.	Serum Ca mg./100 c.cm.	No.	Serum Ca mg./100 c.cm.	No.	Serum Ca mg./100 c.cm.
1	10.1	11	9.2	21	9.0	31	10.0	41	9.7
2	10.3	12	8.4	22	9.3	32	11.7	42	11.2
3	9.4	13	9.0	23	10.4	33	10.5	43	10.1
4	10.4	14	9.1	24	11.6	34	11.0	44	10.4
5	10.1	15	8.4	25	10.2	35	9.8	45	10.6
6	10.0	16	9.6	26	9.5	36	10.1	46	11.5
7	12.0	17	9.8	27	10.4	37	11.7	47	11.3
8	12.9	18	10.5	28	9.5	38	10.8	48	11.9
9	11.6	19	9.1	29	10.5	39	11.0	49	10.9
10	8.9	20	8.4	30	9.2	40	11.0	50	12.0
								51	10.4

The question arises how far calcium intake in diet influences serum calcium. In one patient who was kept for fourteen days on a diet containing 1.6 grammes of calcium daily the serum calcium rose from 12.9 to 13.6 mg. and fell below 10 mg. when the calcium intake was reduced to 0.7 gramme a day. But such results are by no means constant. In a good many of our cases a low calcium intake did not lower the level of serum calcium appreciably; for instance, in one patient having a calcium intake of 2 grammes daily for two weeks the serum calcium was 11.6, 10, and 10 mg. in three different determinations. With a calcium intake of 0.26 gramme daily for a fortnight the calcium serum figures were 11.2, 10.4, and 9.5 mg.; although during this period the patient had a negative calcium balance, the output being larger than the intake. While there is a noticeable tendency for serum calcium to fall with low and to rise with high calcium intake, it is clear that serum calcium values are to a great extent independent of the intake. Serum calcium values by themselves can hardly be utilized as a criterion of an insufficient calcium intake.

Calcium Balances

In our experiments patients were put for a period of fourteen days on high and low calcium intake, all other factors, including the nitrogen intake, remaining the same so far as possible. Between the two periods the patients were kept for some time on a normal diet. With an intake of 0.247 gramme the total output of calcium (Table II) was 0.415 gramme. It increased under an intake of 0.349 gramme, and still more so under 0.39 gramme intake. It will be seen that although with 0.39 of a gramme intake of calcium in the diet the intake is still less than the output, the latter is in this instance greater than when the calcium intake was 0.247 gramme. The same applies

TABLE II.—*Percentage Output of Calcium on Various Intakes*

No.	Daily Intake (gm.)	Daily Output			Percentage of Output in Relation to Intake	Daily N Intake (gm.)	No. of Cases
		Urine	Faeces	Total			
1	0.247	0.292	0.123	0.415	168.2	5	4
2	0.349	0.264	0.165	0.429	124.0	10	6
3	0.390	0.368	0.142	0.510	130.3	10	13
4	0.579	0.338	0.132	0.470	83.0	10	6
5	0.824	0.405	0.154	0.559	68.1	25	8
6	1.791	0.623	0.409	1.032	65.0	10	13
7	1.990	0.315	0.282	0.597	30.0	5	4
8	2.566	0.460	0.371	0.831	35.2	25	8
9	2.712	0.442	0.290	0.732	27.0	25	6

when comparison is made between the first and second series of cases. These figures suggest that when the calcium intake is low the calcium requirement values become reduced, for in the first series of cases an intake of 0.415 gramme would make good the calcium loss, whilst in the second series of cases it would require 0.429 gramme to balance the calcium output.

Starting with the fourth series of cases we find that the calcium output is greater in this series taken as a whole than in the first group of cases; but they differ from all the latter in so far as from now onwards the calcium intake is greater than the output. (The actual output in the fourth series of cases is slightly lower than in the third, but the difference is so slight that it does not really count, considering the large number of cases.)

We are now in a position to consider balances between calcium intake and output, particulars of which will be found in Table II under the heading "Percentage of Output." In the first three series of cases there is a negative balance, the output being greater than the intake. In all others the balance is positive, the intake being greater than the outgoings. There is a depletion of calcium in the first three series of cases and an accumulation of the substance in all the others. We may take it that the calcium intake covering optimum requirements is one with neither a negative nor a positive balance. Looking at Table II, this will be found between a calcium intake of 0.39 and 0.579 gramme. This figure agrees quite well with that of Sherman, Rose, and Rose (1920), who found the minimum calcium requirement to be 0.45 gramme a day for an adult. The minimum calcium requirement is probably lower than the figure given by these authors. In our first series of cases under an intake of 0.247 gramme the calcium output was 0.415 gramme, so that the latter amount would restore the equilibrium between income and expenditure. In our experiments on protein metabolism we found that a low protein intake, which at first resulted in a negative balance, if continued for a long period ultimately established an equilibrium. In this way we have obtained equilibria on very low protein intake. Very likely this applies also to calcium. Our experiments with a low calcium intake, however, did not last longer than two weeks.

Negative Calcium Balance

Calcium metabolism is very complicated, a considerable number of factors coming into play, and some of its features are still awaiting clarification. In the long run the organism cannot put out more calcium than it takes in. Ultimately some sort of equilibrium on a lower level of income will have to be established. In cases in which this does not take place a condition resembling osteomalacia must appear. The bones become soft owing to depletion of the calcium deposits. We do not know whether this condition is met with in England. In any case it is very rare. But, apart from this condition, we may be quite sure that ultimately some balance is estab-

lished between intake and output. One of us has made careful inquiries from a large number of patients attending the Heart Hospital in regard to the diet they are in the habit of taking at home. In no one instance was it found that the average calcium intake was below 0.45 gramme daily. In a good many instances the calcium intake was far above this figure—sometimes four or five times greater. Still more significant is the absence of evidence of any kind that adults (pregnant women excepted) suffer from the effects of calcium insufficiency. Rickets and tetany we may safely leave out of consideration. Sometimes in cases of nephritis the blood calcium tends to be low, but in this instance we may be sure it has nothing to do with an insufficient calcium intake. In some cases of malnutrition a low blood calcium is observable, but in these cases obviously it is not the calcium intake alone which is insufficient. One of us has been looking for years for cases of calcium insufficiency in an extensive hospital practice, and latterly in an institution where normal people are examined periodically, but not one case was found. The dental surgeon of the institution just mentioned makes *x*-ray examinations of the teeth as routine: he too was unable to draw attention to one case of calcium insufficiency. None of us remembers seeing a pathological specimen from an adult that exhibits a lesion in which calcium deficiency is a factor. Yet we are assured on the authority of no less a person than Sir John Orr that in about half of the population of this country the calcium intake is below requirements. In other words, every second person we meet is a victim of hypocalcaemia. Well, all we can say is that since this type of malnutrition gives rise to so few manifestations it cannot be such an undesirable state to be in.

Positive Calcium Balance

On a high calcium intake there is retention of this substance. We may be sure that the piling of calcium in the body cannot continue *ad infinitum*. With a positive e the depots of the body are filled to overflowing. what is more important, we have definite evidence in such circumstances tissue calcium is raised, includ- g tissue calcium of the blood vessels. A number of abbits have been kept by us on a diet rich in calcium, and here are the results of the analyses of two aortas.

	Diet	Calcium of Aorta
Rabbit 1	High calcium	16.2 mg./100 gm.
,, 2	,,	16.9 ,, ,,
Control animal	Normal ,,	9.0 ,, ,,

After a certain level of accumulation of calcium is reached an equilibrium must be established between income and output. But the body calcium under such conditions will be higher all round than under a moderate calcium intake. Such is one effect resulting from excess of calcium intake.

Another aspect of high calcium diet is as follows. We have seen that with a high calcium diet calcium is retained; the total output is nevertheless larger under this condition than with a moderate calcium intake. Using the formula of Hill and Bancroft for estimating kidney work, which is

$$A = RT\left[\Sigma\left(C_u \log_e \frac{C_u}{C_b}\right) + \Sigma C_b - \Sigma C_u\right]$$

where C_u = molar concentration in urine of any constituent,
and C_b = ,, ,, ,, blood ,, ,,

we found in one case the work of the kidney—expressed as litre atmos./litre—to be 18.8 on a calcium intake which was only moderately high, whilst on a lower calcium intake it was 5.1. In another case on a calcium intake which was moderately high the figure was 14.0, whilst on a lower calcium intake it was 0.9. We found that calcium comes second only to protein as an important factor in kidney strain. Now it is an established fact (Harris, 1937) that if damaged kidneys are called upon to perform excessive work the blood pressure rises as an adaptation in order to help the kidney to get rid of the products of metabolism. It is evident that every gramme of calcium which is taken unnecessarily will raise the blood pressure in incipient and established cases of hypertony and in turn overstrain the heart, the blood vessels, and the kidney. It must with mathematical accuracy adversely affect the life of the victim.

We know that arteriosclerotic vessels contain more calcium than normal ones. Whether this is simply a secondary effect or whether the condition is helped along by an excessive calcium intake has not been established as yet. It is at present the fashion to disregard diet as a factor in this type of disease; but the above-mentioned findings in the aortas of rabbits fed on diet rich in calcium will take a great deal of explaining away. Long ago it was shown (Jacoby, 1916) that calcium "thickens" the kidney's filter and makes the performance of its function more difficult. According to the Registrar-General's returns, arteriosclerosis is more prevalent among the affluent classes—the people who are in the habit of taking food rich in calcium, and protein too. It is possible that the poorer classes are less prone to this disease because the calcium intake among other types of food is generally lower. It cannot be said that as yet the evidence conclusively establishes a relation between arteriosclerosis and nutrition, but the facts so far ascertained are highly suggestive.

Conclusion

It can be said that there is no particle of evidence which suggests that the vast majority of the population of this country are suffering from the effects of calcium insufficiency. Indeed, with a high degree of certainty it can be affirmed that the calcium intake under the present dietary regime is ample. On the other hand, a considerable amount of evidence exists that large sections of the population are in the habit of using too much of the type of food which is rich in calcium. There may be an indication for reducing the food calcium, but there is none at all for increasing it. Sir John Orr concedes that in half the population the calcium intake is satisfactory. Well, this half will be suffering from the effects of hypercalcaemia if the calcium content in our diet is raised.

We are indebted to Prof. Roaf for invaluable help and to Dr. Parrington, who is in charge of feeding experiments at the Institute, for the rabbit aortas referred to in the text.

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The following medical promotions in and appointments to the Venerable Order of the Hospital of St. John of Jerusalem were announced in the *London Gazette* of January 3: as Commanders (Brothers), Major-General N. M. Wilson, C.I.E., O.B.E., I.M.S., Colonel H. Stott, O.B.E., I.M.S.; as Officers (Brothers), Dr. J. R. S. Park, Colonel W. C. Paton, I.M.S., Dr. W. Steven, Sir C. S. Hicks, M.D., Dr. V. W. T. McGusty, O.B.E., Dr. R. B. MacGregor, Dr. N. Jennings; as Associate Officers (Brothers), Dr. P. Parthasarathy, Colonel P. B. Bharucha, O.B.E., D.S.O., I.M.S.; as Serving Brothers, Dr. W. Hughes, Dr. A. P. Gorham, Dr. J. A. L. Roberts, Dr. H. Mercer, Dr. W. L. Stewart, Dr. H. W. Miller, Dr. S. McClure, Dr. R. A. W. Procter, M.C., Colonel D. C. L. Orton, Dr. T. O'Brien, Dr. H. M. Mills, Dr. J. M. Morris, Dr. C. D. Wilson, Dr. H. H. Warren, Dr. R. R. Scott, C.M.G., M.C., Dr. N. Chilton; as Serving Sisters, Dr. Margaret Joyce, Dr. Elsie C. Hanson, Miss Hilda M. Lazarus, F.R.C.S., Dr. Mabel C. Freeston.

A CASE OF CEREBRAL CHOLESTEATOMA

BY

I. R. S. GORDON, M.B.

The following case seems to be unusual enough to merit description.

Case Report

The patient, a man aged 36, was admitted to hospital in March, 1940, complaining of headaches, attacks of giddiness, and a right-sided hemiplegia. He was quite well until 1933, when he began to suffer from attacks of giddiness, after which he could hear and see objects but was unable to understand what was said to him. These attacks continued to occur more often until in 1936 they recurred about once a month, and were associated with frequent headaches, both frontal and temporal. At this time there were no visual defects or loss of consciousness, his blood pressure was 125/90, and no abnormal physical signs were found. His headaches were controlled by 10 grains of aspirin. His case was diagnosed as petit mal. In 1937 he was admitted to hospital with a left-sided mastoiditis. A mastoidectomy was performed. After this his condition showed a temporary improvement, but in 1939 he began to deteriorate, and developed clumsiness, with progressive weakness of the right side of the face, the right arm, and the right leg. There was no visual defect or vomiting.

Examination.—On admission the findings were: Constricted pupils, equal, but reacting only sluggishly to light and accommodation; lack of expression and weakness over the whole of the right side of the face; slight deafness in the left ear; power and co-ordination defective in the right arm and leg as compared with the left side; tendon jerks in the right arm and leg exaggerated; right abdominal reflexes absent; plantar reflexes extensor on the right, flexor on the left, side; temperature 97.6° F.; pulse 80; the optic disks were both normal; forced grasping not present; speech normal; mental state normal apart from a slightly defective memory and some lack of a sense of proportion.

Investigations.—On lumbar puncture C.S.F. fluid, clear, colourless, and without clot, was obtained under a pressure of 190 mm. of water; cells, two lymphocytes per c.mm.; albumin 30 mg., sugar 40 mg., and chlorides 710 mg. per 100 c.cm. A blood count showed 5,900,000 red cells per c.mm., 112% haemoglobin (Haldane), and 8,000 white cells; the blood sedimentation rate was within normal limits. The Wassermann test gave a doubtful result, and the Meinicke reaction was negative. A radiograph of the skull showed no evidence of neoplasm; but a special radiograph of the mastoid processes revealed sharply defined translucent areas replacing the left mastoid air cells, with an adjacent sclerosis, suggesting post-operative translucency or possibly cholesteatoma; the right side was normal. An electro-encephalogram disclosed abnormal delta waves, frequency 2½ to 3 per second, accentuated by overbreathing—indicative of a slowly growing space-occupying lesion (neoplasm, abscess, or granuloma) localized to the left temporal region.

Course.—On April 8 and again on April 12 the old mastoidectomy wound was explored, and fluid was obtained from beneath the dura—20 c.cm. on the first occasion and 90 c.cm. on the second. This fluid was pale yellow and translucent, with flaky shimmering crystals. It was reported by the pathologist to contain numerous epithelial scales and cholesterol crystals but no pus cells or micro-organisms, and was described as similar to that obtained from a branchial cyst. Three days later the patient developed a pyrexia of 103° F., headache, neck rigidity, and a positive Kernig's sign. The cerebrospinal fluid was now turbid with numerous polymorphs, and Type I meningococci were grown. In spite of sulphapyridine therapy his condition slowly deteriorated, and he died on April 22.

Post-mortem Examination.—A necropsy was performed, and besides evidence of a diffuse purulent leptomeningitis, a tumour 8 cm. in diameter was found. This appeared to replace the left temporal lobe and a large portion of the left frontal lobe, to form part of the wall of the left lateral ventricle, and to compress the right temporal and frontal lobes. It was soft and friable, and appeared to be encapsulated in some parts, though it was difficult to say macroscopically whether the tumour compressed or invaded the brain tissue.

Microscopical examination revealed that the soft inner portion of the tumour consisted mainly of squamous epithelial cells and cholesterol crystals. From sections of the edge of the tumour it was seen that the boundary was a thin layer of stratified squamous epithelium. The zone external to this consisted of compressed nervous tissue and showed a heavy fibrillary gliosis with some thickening of the walls of the blood vessels.

Commentary

There seems little doubt that this tumour was a cholesteatoma, the histological report agreeing well with previous descriptions of this type of tumour, especially in the presence of an external limiting zone of stratified squamous epithelium. Unusual features are the large size of the tumour and the late development and mild character of the clinical manifestations.

It is generally thought that cholesteatomata arise from embryonic cell inclusions of an ectodermal origin, possibly in connexion with the branchial clefts. Some authors, however, have suggested that they arise—especially those of the middle ear—by metaplasia of the columnar epithelium of that cavity secondary to chronic inflammation (Critchley and Ferguson, 1928). In the latter connexion it is perhaps of interest that in this case mastoiditis was present, and the clinical history would seem to indicate an early involvement of the inner ear.

The situation in which the tumour was found accounts for the relatively slight clinical manifestions, in spite of the size and extent of the growth. The histological examination seems to show that the brain was grossly compressed rather than invaded by the tumour. The left frontal and temporal lobes are silent areas, and it is characteristic of a tumour in this position that the first localizing sign should be a right hemiplegia and should appear so late after the onset of the patient's illness.

Acknowledgment must be paid to Prof. Golla and Dr. Grey Walters for the preparation of the encephalogram and to Dr. R. M. Norman for the preparation and examination of the tumour sections.

REFERENCE

Critchley, M., and Ferguson, F. R. (1928). *Brain*, 51, 334.

Skim-milk, perhaps because of a popular old advertisement, is a rather opprobrious term, and the prejudice against this product in America is such that according to the U.S. Department of Agriculture only about 12% of the skim-milk produced is used in the manufacture of dairy products. In a paper by Mr. J. S. Abbott at the sixty-ninth annual meeting of the American Public Health Association it was urged that the misuse of skim-milk constitutes an enormous economic waste. It contains all the essentials of whole milk except the milk fat and fat-soluble vitamins, and it even contains a certain amount of each of these, though not so much as whole milk. The Nutrition Committee of the League of Nations stated that, pint for pint, skim-milk contains more calcium, phosphorus, iron, and protein (though, of course, fewer calories) than whole milk, and is much cheaper. It is a good foodstuff for animals, but to feed it to pigs is unsound economics because it requires 10 pounds of the food nutrients in skim-milk to produce 1 pound of food nutrients in the form of pork. Industry and legislative effort to create a market for this wholesome foodstuff, says the author of the American paper, would be in the interest of consumers and dairy farmers alike, and there ought not to be any restrictions or discriminations against compounding skim-milk with other foodstuffs for use as human food in the manufacture of food products that supply a want of the people and that can be produced economically to advantage.

Clinical Memoranda

Benign Synovioma arising in a Bursa

The following case is rare enough to warrant publication.

CASE REPORT

A married woman aged 69 was admitted to St. Bartholomew's Hospital on March 3, 1939. Four years before admission she had fallen in the street and hurt her right knee. Fomentations were applied and she was confined to bed for six weeks. Six months later the medial side of her right knee had become swollen and inflamed, and what she described as a "wart" appeared in this situation. There was slight pain and the movements were only slightly impaired. At the Poplar Hospital the condition was diagnosed as an "infected wart with prepatellar bursitis." Fomentations were applied, and on one occasion the fluid was tapped, a few centimetres of blood-stained fluid being withdrawn. Haemolytic streptococci were grown from the fluid.

She attended the Poplar Hospital out-patient department for about three weeks. At this time the swelling had almost disappeared, but the "wart" remained. This slowly increased in size. After a while fluid reaccumulated, and the patient applied fomentations and kept the knee bandaged. She found that on applying pressure over the swelling fluid could be expressed through the "wart." If left for two or three days fluid would rapidly reaccumulate, resulting in a painful swelling in the centre of which the "wart" was situated. This swelling would go down on squeezing out the fluid.

On examination there was a fluctuating swelling about 3 in. by 2 in. situated over the medial condyle of the tibia medial to the tuberosity. It had the characteristics of a bursa, but did not correspond in position to any of the constant anatomical bursae. In the centre of the swelling there was an area about 7 mm. in diameter covered with a crust. On removing the crust a mass of closely packed papilliferous processes was seen, giving the surface a warty appearance. On pressing the swelling serous fluid exuded from this warty portion. All fluid was expressed easily. A solid mass could then be felt under the skin. Pressure on this caused the papilliferous processes to bulge through the skin opening. Movements of the right knee were full and painless. There was no abnormal mobility and no crepitation on movement. No patellar tap was obtained. The glands in the groin were not enlarged. The patient was quite well in herself, and general medical examination revealed nothing of note. There had been no loss of weight. The family and past histories contained nothing relevant.

A radiograph of the right knee showed marked osteophytic formation on the tibia, femur, and patella. There was little evidence of erosion of cartilage. A small lateral incision was made on each side of the central warty area. Pressure then delivered a mass of peculiar papilliferous growth through the incision. This was removed and kept for section. A quantity of the same type of tissue was left behind. It appeared to extend towards the knee-joint. The skin incision was closed with silk. The section was reported on by Dr. Magnus. He stated: "Section shows a tumour consisting of sheets of cells which in some areas resemble fibroblasts and in others reticulum cells. Mitotic figures are spare. The tumour should be regarded as a primary tumour of synovial membrane—a synovioma. These are tumours which vary greatly in their degree of malignancy. This tumour looks relatively benign and shows no evidence of rapid growth."

The tumour was excised by Mr. Hosford under general anaesthesia. An elliptical incision was made around the affected area of the knee with a wide margin of tissue. The affected area was dissected out, together with fatty surrounding tissue. The lump showed no communication with the knee-joint. It was found to lie entirely in the subcutaneous tissue and measure about 2 in. by 1 in. by 1·2 in. The wound was closed in layers. The report on tissue removed ran as follows: "The specimen consists of a piece of skin bearing a sinus opening leading to a cavity lined by proliferative tissue. There is no macroscopic evidence of invasion of the surrounding tissues. Section shows the bursa to be lined by a transitional type of epithelium which in many areas is proliferating and shows evidence of locally infiltrating the surrounding tissue. The tumour would appear to be a type of synovioma arising from a bursa."

Fifteen months after the operation the wound was well healed and there was no sign of local recurrence or of secondary deposits. The patient was in excellent health.

COMMENTARY

There are few reports of tumours arising from synovial membrane in the literature, especially of this country. These tumours have special histological features. Modern work inclines to the view that synovial tissue is a tissue *sui generis*, and it is not surprising, therefore, that it can give rise to tumours which, though in the past not well recognized, are nevertheless distinctive. Such growths have been found in relation to joints, tendon sheaths, and bursae. Most of the tumours reported as arising from synovial membrane have been malignant. A detailed description of the histology of these growths, together with a proposed classification for the whole group, will be found in the excellent paper by Berger (1938). It also contains an admirable review of the relevant literature.

On both clinical and histological grounds the tumour here reported was considered innocent, and the subsequent history supports this view. However, it is important to insist that a patient from whom any type of synovioma has been removed should attend at intervals for follow-up, because even in the case of highly malignant synoviomas a history of from one to seven years' slow local growth is often obtained before any signs of malignancy have set in. The lungs are the commonest site for metastases.

I have to thank Mr. Hosford for permission to publish this case.

R. N. HERSON, M.B., B.S.,
Assistant Medical Officer, Hemlington.

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At the recent council meeting of King Edward's Hospital Fund for London the Duke of Kent read a special message from His Majesty the King expressing His Majesty's admiration for the way the hospitals were carrying on under the present difficult conditions. The Duke went on to announce that the King's Fund was about to make a Christmas distribution of £300,000 to the London voluntary hospitals, which brought the total amount distributed by the Fund since its foundation in 1897 to over £10,000,000. Twenty-two additional hospitals would benefit from this year's distribution, as the King's Fund area had been extended to cover the whole of the Metropolitan Police District. Referring to the opening last April of the Nursing Recruitment Centre, which is concerned with propaganda on behalf of nursing in voluntary hospitals, the Duke said he knew that hospitals could be relied upon to co-operate with the centre by keeping it informed of their needs. There were in London so many hospitals that girls who wished to take up nursing were apt to be bewildered. They might apply to hospitals with long waiting lists and become discouraged, while there might be others which would be very glad to accept them. The Duke concluded by expressing his sympathy with the hospitals throughout the country which had suffered so severely in the war. The large number of hospitals that had been seriously damaged, he said, and the heroism and devotion of the staffs in protecting and rescuing the patients had profoundly stirred public feeling. The hospitals were as much dependent to-day as ever before upon voluntary contributions for the maintenance of their ordinary work, and he had no doubt that many people would desire to express their sympathy by giving them increased support.

Reviews

TREATMENT IN GENERAL PRACTICE

Treatment in General Practice: Surgery (continued). Articles republished from the *British Medical Journal*. Volume IV. (Pp. 562; 143 illustrations. 16s. net.) London: H. K. Lewis and Co., Ltd. 1940.

This volume continues an important series of articles which have appeared in the *British Medical Journal* over a long period; three volumes have already been published. The present book contains fifty-five articles on surgical conditions as widely varied as fracture of the forearm and rectal prolapse, and each gives a brief but clear picture of an important subject; throughout the whole volume a uniformly high standard is maintained.

There is a wide field of surgery which is the domain of neither the specialist nor the general practitioner but in which success depends on skilful co-operation between the two. Hitherto it has been a somewhat neglected field, and the *Journal* has done a very sound piece of work in calling attention to its existence and to its importance, which, at the present time, when the full health of every individual is vital to our country, can scarcely be exaggerated. It is well that the surgeon should realize that the effective repair of a fractured finger may be of far more significance to the State than the brilliant removal of a carcinoma of the rectum, and that the general practitioner should realize how much may depend on his management of a simple injury.

In *Treatment in General Practice* we have a series of pen-pictures of the most modern methods of treating common injuries and disabilities. Each article represents the considered experience of an expert in a particular field, and may be taken as an authoritative statement of the latest practice. Even those of us who are in the closest contact with surgical work and surgical teaching can scarcely read a single chapter without finding some new point of real value. For instance, the account of supraspinatus tendinitis opens up an entirely new view of injuries around the shoulder-joint, while the article on the treatment of haemorrhoids shows that careful attention to exact detail which reveals the expert. But every article throughout the book shows exact practical knowledge, and no one who wishes to keep abreast of modern surgical technique can afford to be without it.

H. S. SOUTTAR.

SEX AND REPRODUCTIVE PHYSIOLOGY

Recent Advances in Sex and Reproductive Physiology. By J. M. Robson, M.D., D.Sc.Leeds, F.R.S.Ed. With an introduction by Prof. F. A. E. Crew, M.D., D.Sc., F.R.S. Second edition. (Pp. 329; 62 illustrations. 15s.) London: J. and A. Churchill, Ltd. 1940.

During the six years that have elapsed since the first edition of this book was published the research work of the chemist has added much to our knowledge of sex hormones. Pure crystalline substances have been isolated, their structure analysed, and active synthetic forms prepared. One of the immediate results of this has been a great increase in the amount of certain of these substances, especially the oestrogens, available for clinical trial, and their effects have been tested in a variety of conditions. It is difficult to keep pace with progress in endocrinology, and for this reason the second edition of Dr. Robson's book, with its carefully and clearly summarized account of the subject, will be welcomed. New chapters dealing with the properties of the androgens, the chemistry of the gonadotrophic hormones, and the technique of hormone standardization have been added. Those sections devoted to the therapeutic uses of the hormones summarize the results obtained by numerous workers, but fail to discriminate adequately between the claims of individuals and the results of a more general clinical experience. In the same sections the use of the terms "anovular haemorrhage" and "metropathia haemorrhagica" as synonyms is incorrect and is likely to cause confusion, but it should not be difficult to remedy these defects in subsequent editions.

The illustrations are good, and an excellent summary of relevant literature is given. The book can be warmly recommended.

THE ART OF SURGERY

The Art of Surgery. A Textbook for Students and Practitioners. By H. S. Souttar, D.M., M.Ch.Oxon., F.R.C.S. Fourth edition. (In two volumes, pp. 402 and 377. 25s. net the two volumes.) London: William Heinemann (Medical Books) Ltd. 1940.

The production of a fourth edition of Mr. Souttar's textbook in two handy-sized volumes, printed in a clear modern type, makes this the most attractive issue that has yet appeared, while the thorough revision which the text has undergone in order to bring it up to date should make a wide appeal to medical students everywhere. Useful little black-and-white sketches, many of which were placed in the wide margin of previous editions, are now incorporated in the text and are the better for this rearrangement. We have always thought the title a happy one, being reminded of a remark of Wilfred Trotter's that medicine (which may be held to include surgery) is an art rather than a science—the suspension of judgment so essential in science cannot for long be maintained by a practitioner who would retain the confidence of his patient. Many will not agree with Mr. Souttar that division of the sensory trigeminal root is an operation of considerable danger, as in trained hands the mortality of this procedure is less than 1%; nor that a permanent cure of trigeminal neuralgia is obtained from alcohol injection of the ganglion, because many cases relapse in from six months to two years after successful injection.

But on the whole we can find little to criticize in the text, and have to congratulate the author on its essential soundness throughout and on the great improvement he has been able to effect on previous editions. This work is a safe guide for the student beginning surgery and entering the surgical wards, and will probably replace some of the older many-times-revised textbooks, whose original authors have long since died and whose present text, in the hands of followers, they would probably not recognize. Students using this textbook will be wisely and soundly inducted into the art of surgery.

CLINICAL PATHOLOGY OF EYE DISEASE

Introduction to Ophthalmology. By Peter C. Kronfeld, M.D. (Pp. 331. $3.50 post paid; or 19s.) Springfield and Baltimore: Charles C. Thomas; London: Baillière, Tindall and Cox. 1940.

Prof. C. Kronfeld's work, though intended for students, is not an elementary textbook but an attempt to formulate the principles of "that portion of ophthalmology which is a necessary part of basic medical education." The book is presented as a supplement to the short clinical course in ophthalmology that students have to undergo; it stresses pathogenesis and omits altogether details of diagnosis and treatment except in so far as they illustrate a general principle. Many common diseases find no place in this volume, as "they are unimportant for the exposition of ophthalmological principles." Within the

strict limits the author has imposed upon himself he has produced a readable and useful series of essays of interest to the specialist rather than to the student. Prof. Kronfeld has drawn widely on the basic sciences in his interpretation of such ophthalmological problems as cataract and glaucoma, and has ably summarized much recent work on anatomy and physiology in his chapters on the visual pathways and on the retinal circulation. With so much that is new and provocative it is a pity that the uniformity of the book is marred by digressions into elementary expositions and by some looseness in style. This work is really an attempt—the first of its kind—to produce a textbook on the clinical pathology of eye diseases, and it is regrettable that the author had not more clearly delineated the scope of his efforts and so avoided the pitfall of attempting to serve conflicting objectives. Incidentally, are English social titles so confusing that Sir Jonathan Hutchinson has to be recognized under the appellation of Sir Hutchinson? In spite of its defects the book is well worth perusal by ophthalmologists interested in the scientific aspects of their specialty.

Notes on Books

The association of tuberculosis, such a commonly chronic disease, with literary distinction and that rare gift, genius, has aroused a considerable amount of interest. It may be recalled that the late Sir Henry Head, in the Goulstonian Lectures in 1901 on "Certain Mental Changes that accompany Visceral Disease," dealt with this association and utilized his observations when house-physician at the Victoria Park (now the London) Chest Hospital. Dr. L. J. Moorman of the Oklahoma University School of Medicine, medical director of a private sanatorium for a quarter of a century and much interested in psychopathology, has in *Tuberculosis and Genius* (Cambridge University Press, 15s. net) now brought out an attractive volume on this subject. In an introduction he reviews the opinions of others, especially concerning the hypothetical stimulating action of a tuberculous poison on the brain, which may bring out a latent streak of genius. There may, however, be other mechanisms: for instance, the recognition that illness is a handicap and that life is shortened, which—art being long and time fleeting—induces a powerful compensatory effort at achievement. A list, admittedly incomplete, is given of more than eighty distinguished writers who were tuberculous, beginning with John Milton and including Samuel Johnson, who in early life was touched by Queen Anne for tuberculous glands in the neck. The remainder, and the greater part, of the book is devoted to ten separate analytical essays, each with a portrait—on Robert Louis Stevenson, Friedrich Schiller, Marie Bashkirtseff, Katherine Mansfield, Voltaire, Molière, Francis Thompson, P. B. Shelley, John Keats, and St. Francis of Assisi—with the object of showing the more evasive elements of personality as influenced by psychopathology, and how they become more tangible through the intimate presence of a chronic disease.

It is good to see that the war has not prevented the Medical Society of Individual Psychology from issuing its helpful pamphlets—helpful because they provide the general reader with straightforward accounts of medico-psychological problems that arise in the course of his daily practice. Pamphlet No. 22 (The C. W. Daniel Company, Ltd., 2s. 6d.) within forty-eight pages includes articles by Dr. A. Sandison, on escape and activities; Dr. R. Hargreaves, on the flight into normality; and Dr. H. Crichton-Miller, on discipline and leadership. The last article is by Dr. F. Marjory Edwards, on China under war conditions.

The appearance of a third edition of Dr. W. WILSON INGRAM'S small but comprehensive book, *The Diagnosis and Treatment of Diabetes* (Sydney and London: Angus and Robertson Ltd., 6s. 6d.) shows that it has established its usefulness in Australia. It is clearly and well written for the practitioner, who must find its clear directions, especially on diets, a relief in their dogmatism. The short new chapter on protamine-insulin treatment (the author calls it "modified" insulin) is the best in the book, and gives the practitioner real help by describing the significance of urine tests for sugar. The same is unfortunately not done with "unmodified" insulin, and this chapter contains only vague phrases about keeping the blood sugar normal. Surely, too, the reader—at least the English one—would find it easier if the terms "soluble" or "ordinary" insulin and protamine-insulin were used instead of "unmodified" and "modified" insulin. In the production of insulin all forms are modified from the pancreas elaborations and are liable to further modification as research produces new products. Such criticisms are minor, and the book is on the whole most helpful. The section on diagnosis, however, is confusing and should be rewritten. The blood-sugar curve on page 28 is described as mildly diabetic or else a lag-storage curve. It is typical of neither, and is so unusual that it is probably due to a technical error such as arises occasionally with the Maclean blood-sugar method, which the author recommends to practitioners.

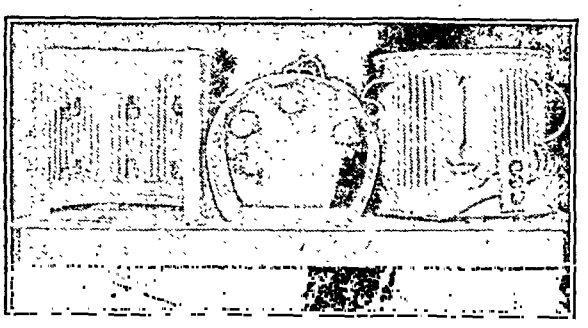
Preparations and Appliances

A CHEAP RADIANT-HEAT CAGE

Dr. CHARLES MOFFATT (medical officer in charge, first-aid post, Irlam, Manchester) writes:

The following description and photograph of a radiant-heat cage suitable for the treatment of cases of shock at first-aid posts may be of interest to medical officers and others in charge of such posts and of hospitals where the treatment of cases of shock have to be undertaken and where provision of a cheap cage would be appreciated.

Irlam is a semi-rural district which has no hospital. As a consequence our first-aid post had to be equipped with more than the bare necessities allowed by the Ministry, consisting of dressings, stretchers, a few instruments, and drugs. All other equipment deemed necessary had to be bought or improvised. The cage was made from a galvanized dustbin: the bottom was removed and the body of the bin opened down its seam; the sharp edges were padded with wool, kept in position by strips of elastoplast. To hold the lamps six



small wall brackets made of bakelite and bought from Woolworth's were fitted, three switches were also bought at Woolworth's, fixed to a wooden block, and fitted to the outside of the cage. The wiring of the switches, brackets, and plug was effected by using twin flex cable running through lengths of flexible gas-tubing: this was done to prevent fraying of the cable by blankets and rugs which would be thrown over the cage when used. The lights are wired in pairs, and can therefore be switched on in pairs, so that the amount of heat generated can be regulated. A three-core flex cable is used to connect up to the power plug; this carries the earth from the metal parts of the cage. The temperature can be checked by using an ordinary bath thermometer. As this cage is being employed for heating purposes and not for the treatment of fibrositic conditions, six 150-watt tungsten lamps are used instead of the carbon filament lamps usually fitted in a radiant-heat cage.

The post was fortunate in having as one of its members a plumber, who made the apparatus in a few hours at a cost of 35s. Should anyone wish for further particulars I shall be glad to supply them if the inquirer will write to me.

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THE TREATMENT OF CANCER

"Watchman, what of the night?" These were the words used by Sir Alfred Pearce Gould in his Bradshaw Lecture in 1910 when surveying the cancer problem. Now another Middlesex man, Sir Alfred Webb-Johnson, in his Bradshaw Lecture on "Pride and Prejudice in the Treatment of Cancer," published in last week's and the current issue of the *Journal*, bids us take heed of the watchman's answer: "The morning cometh, and also the night: if ye will enquire, enquire ye. . . ." Sir Alfred Webb-Johnson now gives us the answer to his inquiry into the problem of the treatment of cancer. It is an answer which is at once balanced, critical, and stimulating, and one which should give encouragement and hope both to the medical profession and to the victims of cancer. The treatment of malignant disease is dynamic and not static, but its evolutionary aspects tend to be obscured by day-to-day problems. Improvements in treatment are only possible when the results of long-term research can be reviewed and assessed. The latter part of the nineteenth century was the age of heroic surgery in the treatment of malignant disease, and of operations which are now often dismissed lightly as "mutilating." The first two decades of the present century saw the introduction of radiotherapy and the opening up of new and novel lines of treatment. During the two decades from 1920 to 1940 there has been a great extension of radiotherapy, and intensive study of its results, successes, failures, and mistakes, the introduction of systematic case-recording for research purposes, and, finally, the passing of the Cancer Act, with its provision for the setting up of regional centres for the treatment of malignant disease. The past two decades have also seen a great improvement in our knowledge of the natural history of malignant disease, of its pathological features, especially in relation to the histological method of grading tumours, and the introduction of newer diagnostic methods. All these advances have made for much greater scientific accuracy, and with it the clinical dogmatism of the Victorian surgeon has gradually disappeared. Meanwhile we have to face the everyday problem of the patient with malignant disease who requires urgent treatment. He or she must have the best that we can offer, yet the results of what we do to-day can only be fully evaluated in the course of five or ten years. The immediate problem and the long-term research are but the obverse and the reverse of the problem of the treatment of malignant disease. The present war, with its disorganization of population and hospitals, is an opportune moment to survey the results of the labours of the past twenty years.

But why "Pride and Prejudice in the Treatment of Cancer"? Here is Sir Alfred Webb-Johnson's answer: "When I embarked upon my inquiry I found an undercurrent of talk—wild uninformed criticism, a tendency to exaggeration of failures and overstatement of successes. Surgeons and radiotherapists were often in disagreement. There was indeed an atmosphere of 'pride and prejudice.' . . ." The surgeon, knowing he could obtain certain results by operation, was not always interested in radiotherapy. The radiotherapist was often blind to the possibilities of surgery. All of us in this country were too parochial in our outlook, and too inclined to ignore or to dismiss the work of the man across the way, while turning to Vienna, Paris, New York, or Milwaukee as the true Mecca. But this challenge to surgery from radiotherapy has been accepted, and has proved an immense stimulus to the study of the treatment of malignant disease. During the past twenty years the practice of radiotherapy has grown and is still growing at a remarkable rate. Many mistakes have been made in the sphere of radiotherapy, many of the cancer statistics are useless for the purposes of scientific comparison, and methods of treatment are still far from uniform. "In fact, in a recent report of the Radium Commission it is stated that 110 different combinations had been distinguished for the tongue, 53 for the floor of the mouth, 86 for the breast, 56 for the lip, and 66 for the uterine cavity"—truly a bewildering variety.

In a recent paper Paterson[1] dealt very fully with the Ministry of Health publication by Sholto Mackenzie on "Cancer: An Inquiry into the Extent to which Patients receive Treatment." This report divided cases into three groups on the basis of the actual treatment they received. The first, or "curable," group (or potentially so) included the uterus, skin, breast, and buccal cavity; the second, or "treatable," group the stomach, intestine, prostate, rectum, bladder, ovary, larynx, and miscellaneous; the third, or untreatable, group the liver, pancreas, lung and bronchus, gall-bladder, mediastinum, and oesophagus. In the first group the percentage of treated cases varied from 56% to 71%, in the second group from 5% to 42%, and in the third group from 0% to 21%. Treatment is thus likely to be carried out most often if the malignant process is in the uterus, including body, cervix, and vagina; the skin, including genitalia; the breast; or the buccal cavity.

In his survey Sir Alfred compares the results of surgery with those of radiotherapy under the conditions which justify such a comparison. In the case of the skin, although radiotherapy will cure a large proportion of cases, surgical excision is still the method of choice if disfigurement and mutilation can be avoided. The results of radiotherapy in the treatment of cancer of the lip are as good as or better than those of surgery, and these are often achieved without loss of substance. In the case of the tongue the results of radiotherapy closely approximate to those obtained by Butlin, but in view of the mutilation and disability resulting from extensive operations radiotherapy is considered the method of choice for dealing with the primary lesion. The results of the treatment of intrinsic cancer of the larynx by laryngofissure and by irradiation are identical, though only a small group treated by the Finzi-

[1] *British Medical Journal*, 1939, 2, 904.

Harmer technique are available for study. Malignant disease of the oesophagus is still a problem to both surgeons and radiotherapists, and although surgery can claim a few brilliant successes, there have been as yet no lasting cures in cases treated by irradiation. In the case of rectal carcinoma Miles was able to obtain a five-year cure rate of 83% in Stage A cases, but Gordon-Watson has shown that the results of radiotherapy were too uncertain to justify its use in operable cases. In the case of carcinoma of the cervix the results of irradiation are better than those of surgery, even of so experienced a surgeon as Bonney, whose results are not likely to be surpassed. For this reason radiotherapy, with the greater uniformity in its application, is likely to be of much greater value than mass surgery. Finally, in the case of cancer of the breast the comparison of the results of surgery and of radiotherapy is difficult. Gordon-Taylor has obtained a ten-year survival rate, in 84% of Stage I cases, but although Keynes and others have made many valuable contributions to technique, the absence of pathological data makes comparison of results difficult.

It is thus apparent that about half the patients suffering from cancer need some form of radiation therapy, that this work can only be undertaken under the most favourable institutional conditions, and that intensive research is required on every aspect of the cancer problem. At present only about a quarter of the cancer sufferers in this country receive the skilled attention they need and deserve. During the past twenty years the treatment of cancer has made real progress, but much still remains to be done. Radiotherapy has established itself as a valuable method, and the problem of cancer treatment must be viewed as a radio-surgical one. But radiotherapy also has other advantages. It offers to the fear-ridden patient an alternative to the knife, it offers a line of treatment in cases in which operation is contraindicated, and it offers the possibility of greater uniformity in application. Much will depend on the working out of the details of the Cancer Act, but whatever is done treatment and research must go hand in hand. In his review Sir Alfred has given great encouragement to the profession and to the victims of cancer, but he has also pointed out that, as in so many other spheres of medicine, adequate planning is essential if the best results are to be obtained. It is also suggested that there is a shortage of trained personnel, particularly of radiotherapists, for carrying out the proposed treatment at regional Cancer Centres. This may be true; but it is equally true that in this country there are hundreds of highly qualified men who could undergo the necessary training and carry the lamp of knowledge and research to all parts of the country. Before, however, the work and services of these men are made available to the community much "pride and prejudice" in hospital control, administration, and outlook must be broken down. There will be no lack of willing or able volunteers for "planned" medicine when it offers first-class facilities coupled with opportunities for research. One of the few wise remarks ever made by Gideon Harvey, physician to Charles II, comes to mind: "How few good surgeons there are to be found, may easily be judged by what is premised; yet it is very probable, there are more in England, than elsewhere."

HOSPITAL ADMINISTRATION IN THE LONDON COUNTY COUNCIL

It is now fifteen years since the Royal Commission on Lunacy and Mental Disorder reported. The tenor of its recommendations was that the lunacy code should be relaxed with a view to such approximation of the treatment of mental disorder to the treatment of physical ailments as may be consistent with the special safeguards indispensable when the liberty of the subject is infringed. In the new era of enlightenment of which the Royal Commission itself was a sign and a fulfilment the partition existing, both in the public mind and in administration, between physical and mental illness has grown thin. This is evidenced by the establishment of out-patient departments for mental diseases in general hospitals, the new understanding of the mental basis of many cases of physical disorder, and in other ways. The very change in terminology whereby the words "asylum" and "lunatic" have given place to "mental hospital" and "person of unsound mind" is in line with the increasingly humane and scientific care of the insane which has characterized the last century and especially the last twenty-five years.

There still remain, however, some things to be done, or some relics to be cleared away, before administrative procedure, which always lags behind public sentiment, can be said to reflect the new spirit as fully as it might do. Even under the London County Council, the largest and most progressive of hospital authorities, the mental hospitals are administered by a department separate from that of the medical officer of health. The reason for this is easily given. Three years after the report of the Commission presided over by Lord Macmillan, the Local Government Act of 1929 was passed, itself the result of an earlier Royal Commission which had reported first in 1925 and again in 1928. In London the passage of that Act was followed by the largest transference and co-ordination of hospitals in history. The whole of the services of the extinct boards of guardians and the powers and duties of the Metropolitan Asylums Board devolved upon the London County Council, whose medical staff, with Dr. (now Sir) Frederick Menzies at its head, had the task of adapting the large number of general and special hospitals which had been taken over and of bringing them up to the required standard. This was of its kind the largest health measure that any local authority had ever shouldered, and it was the magnitude of the task which caused the postponement of one other rather obvious piece of reconstruction whereby the mental hospitals and the institutions for mental defectives, now accommodating nearly 34,000 patients, would have come under the same administrative direction.

In the London County Council, therefore, there are two quite different departments both dealing with hospitals—one of them directed by the Hospitals and Medical Services Committee, with the medical officer of health as executive officer, and the other by the Mental Hospitals Committee, with its own administrative head. At the time of the transference, eleven years ago, there was much debate whether all the hospitals, including the mental hospitals, should not be grouped together in the one department, in harmony with the report of the Royal Commission on Lunacy; but it

was decided, after careful consideration, to reserve such incorporation until the immense amount of work involved in the transference had been completed, and the general and special hospitals had been thoroughly reorganized and built up into the first-class service that they now represent, an example to the entire municipal world. The burden of the task which the Act of 1929 placed upon the medical officer of health and his assistants was considered to be quite enough for the time being, but it was always understood that incorporation was only deferred, not abandoned. A special report was adopted by the Council at that time which, *inter alia*, charged the Mental Hospitals Committee with the exercise of the transferred functions relating to the care of persons suffering from mental infirmity or defect, but indicated that a clear dividing line between this field and that allocated to the Central Public Health Committee (now the Hospitals and Medical Services Committee) could not be drawn, and that the two would have to act in close co-operation. As time has proved, and as was only to be expected in view of the character of our local government service, the existence of two separate departments has not proved to be any serious detriment to the communal health which they both served. Mutual courtesy and regard for administrative convenience have compensated, so far as they could, for an intrinsic anomaly. The same is true, no doubt, in the sphere of national administration of the relations of the Ministry of Health and the Board of Control. At the same time goodwill cannot always be depended on, in county halls any more than elsewhere, and, even if it could, its existence is no excuse for perpetuating such an arrangement. It is felt by many who are interested in the government of London that the time is ripe for such an incorporation, and the recent retirement under the age limit of the chief officer of the Mental Hospitals Department, Mr. R. H. Curtis, after a long period of devoted service, offers the opportunity of merging the two departments into an administrative whole.

The advantages of fusion are obvious. It is as strange to have within the same authority two separate departments dealing with health, with separate officials, responsible to separate committees, and issuing separate reports, as it would be, say, in the sphere of education to have one department dealing with drill and games and an unrelated department dealing with book learning, or to have a fire brigade which attended all fires except those due to gas explosions, these being dealt with by another brigade quite separately officered. This desire for merging is no question of mere bigness for its own sake or the aggrandisement of officials. It is a question, first of all, of efficiency, of the pursuit of a consistent policy, of the ability to plan in a large way. Such a reform might avert delay in many cases, might promote economy in the purchase of equipment and supplies and prevent overlapping, and might even facilitate interchanges of staff between general and special hospitals on the one hand and mental hospitals on the other, to the advantage of the officers concerned. Whether the institutions are dealing with physical or with mental illness much the same abilities are required in the committees which shape policy and the staff who carry out instructions, except, of course, that in mental hospital work there are certain special considerations, legal and other, for which provision must always be made.

The London County Council now has the opportunity of making a departure which would not only facilitate its own internal work but would be an example to local authorities generally, and in line with —in a sense the completion of—the metamorphosis, which began a century ago, of asylums for detention into hospitals for treatment.

TOWARDS SOLVING THE SHELTER PROBLEM

It was announced last week that the Government has decided to make important administrative changes in connexion with the control of air-raid shelters. The Ministry of Home Security will remain responsible for the number, location, and construction of shelters, and the Ministry of Health for their management and for all matters concerning the health and comfort of those who use them. No doubt the Ministry of Home Security will take the advice of the medical staff of the Ministry of Health on such aspects of shelter construction as bear directly upon hygienic conditions. While policy will be directed by the two Ministries within their clearly defined spheres, administrative responsibility will devolve on Regional Commissioners, who, acting through local authorities, will be responsible for all matters relating to the construction and management of shelters. Alderman Charles W. Key, M.P., who set such a fine example in organizing civil defence in his own borough of Poplar, has been appointed Regional Commissioner for the London Civil Defence Region. In addition to the existing regional staff he will also have the help of seventeen other officers of the Ministry of Health. He proposes to appoint some well-qualified woman who will give her whole time to the study of the problems that affect women and children. The Ministry of Food will continue to be responsible for the supply of food to the canteens.

During the past weeks we have published in the *Journal* a survey of conditions in London shelters, and have noted how far the recommendations of Lord Horder's Committee have been carried out. The multiplicity of authorities and the existing disparity between the actions of local authorities led us to put forward a plea in the *Journals* of December 7 and 21 for unification of shelter control. The necessity for some such action was emphasized by the *Times* in its leading article of December 27, in which it was stated, "Central authority and responsibility ought to be concentrated in a single department endowed with the necessary powers and able to take and execute decisions with promptitude." The shelter problem is neither a local one to London nor a temporary one, and we may have to face another winter of war in which the cities of this country will be subjected to even more intense bombardment than they already experience. Although Ministerial responsibility in relation to shelters has been clearly defined and administrative action now lies in the hands of Regional Commissioners, vigilance will still be necessary and watch must be maintained against the dangers of complacency. Apart from measures to be taken against the risk of infection, the prime need is for the

establishment of reasonable hygienic conditions of living in the shelters. When these have been secured, not in some shelters but in all, an imaginative effort will be required to seize some good out of the evil predicament forced upon us by aerial bombardment. The shelter population, which needs must be drawn from the poorest sections of the community, may be taught those elements of hygiene which they neglect in times of peace, and be educated in measures of preventive medicine. One good alone is already being secured—namely, the widespread immunization of children against diphtheria, to which desirable end the Ministry of Health has given an energetic drive. The Central Council for Health Education, at the invitation of the Ministry, now has ready for distribution a health booklet for shelterers and a series of leaflets dealing with special problems. These have been written in simple direct language, and if there is sufficient indication that they are not without effect, then no doubt the Central Council will continue the work of educating the shelter population. Food has to be measured in terms of guns, ammunition, tanks, and planes, and the Ministry of Food will no doubt carry into the shelters the excellent work it has begun, through the medium of advertisements in the daily press and in other ways, in instructing the people what to eat.

In this small field alone—for only a small proportion of the population lives in the public shelters—the seeds of post-war reconstruction may be sown here and now.

BLOOD CHANGES IN VITRO

The storage of blood for transfusion has focused attention on the changes which occur in red cells surviving outside the body. Recent papers from the Army and the Medical Research Council Blood Transfusion Services[1 2] show that the majority of the erythrocytes remain viable for the purpose of transfusion for at least a fortnight after withdrawal from the donor, and that their chances of survival are improved by the addition of glucose to the citrate solution used as anticoagulant. Every clinical pathologist is now familiar with the morbid anatomical changes which occur in the red cells on storage. The cells become more spherical, with a diminished resistance to haemolysis by hypotonic saline, a decreased tendency to form rouleaux, and a consequent slowing in the speed of sedimentation. The war has made haemolysis and the pre-haemolytic changes in the red cells a matter of common interest, but they have been for many years the subject of intensive research, because they touch on some of the fundamental problems of physical chemistry and pathological physiology. The world of lyospheres and electrokinetic potentials in which these problems are discussed must remain closed to the general medical reader, though it is there that he must look for the final solution of these problems. More easily understood is a paper by Furchgott[3] on the transformation of mammalian red cells from disks to spheres, which occurs when a saline suspension of the cells is placed between a glass slide and cover-glass. This change is in part due to the alkalinity of the glass, but there is also evidence that the glass adsorbs out from the suspension a protein which protects the cells from sphering. This protective anti-sphering factor is contained by both serum and cells. Fahraeus,[4] on the other hand, has shown that when the erythrocytes and plasma are kept separate from each other, as after sedimentation, the haemolytic agent lysolecithin is formed in the plasma. The development of lysolecithin and the pre-haemolytic changes which are associated with its presence do not occur in life owing to the constant interaction at the erythrocyte-plasma interface, which maintains the two moieties of the blood in good health. Lysolecithin was first discovered in the study of the haemolytic action of snake venom, in which it is the all-important intermediary. Singer[5] has followed up the ideas of Fahraeus, and has prepared lysolecithin from normal animal or human serum, to use it as a means of testing red-cell fragility. The resistance of various types of erythrocytes to lysolecithin and to hypotonic salt solution does not by any means run parallel, and there appears to be an important difference between the spherocytes of congenital haemolytic jaundice, which are much less resistant to lysolecithin than normal red cells, and the spherocytes of various acquired and symptomatic types of haemolytic icterus, in which the lysolecithin fragility is normal although the saline fragility is altered. It would be interesting to see how far these ideas of Furchgott, Fahraeus, and Singer are applicable to the solution of the problems involved in the storage of blood for transfusion.

[1] Bushby, S. R. M., *et al*: *Lancet*, 1940, 2, 414, 417, 420.
[2] Dubash, J., *et al*: *British Medical Journal*, 1940, 2, 482.
[3] *J. exper. Biol.* 1940, 17, 30.
[4] *Lancet*, 1939, 2, 630.

ADIE'S SYNDROME

The considerable literature that has grown up on the myotonic pupil since Adie, in an article in these columns ten years ago,[6] clearly brought out its association with loss of tendon reflexes has done much to clarify the clinical picture and but little to reveal the anatomical basis of the affection. It is now accepted that the light reflex is not absent but sluggish in the myotonic pupil, often not being revealed until the patient has first been kept in a dark room for a few minutes. In 80% of cases the pupillary disturbance is unilateral; the reaction to convergence, though more brisk than to light, is slow and, like the light reaction, is followed by slow dilatation of the pupil; and accommodation may be affected. In all this there is a marked contrast with the Argyll Robertson pupil, from which it also differs in occurring more often in women (80% of the patients are women), in being seen most frequently in the age group 20 to 30 years, and in responding normally to atropine. The associated loss of tendon reflexes is not always present or may be the only sign of what must be regarded as a systemic infection, as the pupillary changes may be absent. That Adie's syndrome may be a familial affection is seen from the cases observed by Dressler[7] which occurred in three sisters, while the fact that it has been reported in a variety of neurological affections has rather tended to confuse the clear-cut picture of an innocent lesion which Adie sought to establish. In recording six new cases of the syndrome Scheie[8] points out that in all of them one pupil became markedly constricted on the instillation of 2.5% solution of mecholyl, a stable choline substance (acetylbetamecholine chloride); fifty normal controls gave no such response. Drawing on the work of Loewi, Dale, and others on the chemical mechanism of the transmission of a nerve impulse from the nerve ending to the effector cell, and on the phenomenon of sensitization of effector cells when the nerve supply is interrupted on the post-ganglionic route, Scheie holds that the pupillary changes in Adie's syndrome are to be explained by a partial parasympathetic denerva-

[5] *Amer. J. med. Sci.*, 1940, 199, 466.
[6] *British Medical Journal*, 1931, 1, 928.
[7] *Klin. Wschr.*, 1937, 16, 1013.
[8] *Arch. Ophthal.*, Chicago, 1940, 24, 225.

PRISONERS OF WAR IN BELGIUM AND OCCUPIED FRANCE

REPORT OF INTERNATIONAL RED CROSS DELEGATES

The International Red Cross at Geneva has appointed delegates to Germany and the territories it is occupying, also to Great Britain, Canada, Egypt, Greece, Italy, unoccupied France, and Kenya, to see that the terms of the international conventions are obeyed, to inspect prisoners of war and interned civilians in camps, and to act as liaison officers between the belligerent countries and Geneva. A representative has also been sent to Lisbon to supervise the passage of food parcels and clothing to prisoners of war. All the delegates are Swiss.

It is hoped shortly to receive explicit information regarding the health and dietary in the prison camps in Germany itself. The great difficulty is the extraordinary delay in communication with Geneva, amounting in some cases to six weeks. Meanwhile reports are to hand from the delegates to occupied France and Belgium, Dr. Marcel Junod and Dr. R. Marti. The reports from which we make the following extracts have been received by the British Red Cross and St. John War Organization in London from the International Red Cross. It appears that the treatment of prisoners—of airmen particularly—is satisfactory, all things considered, and that the British wounded in many cases are looked after by British doctors.

Dr. Junod was the first foreign representative to visit the several hospitals in Belgium and France where British wounded have been taken. At the Institut Bordet in Brussels he found seventeen private soldiers—all cases of open fracture, with osteitis and osteomyelitis—and reports that the treatment, under German specialists, was excellent and the food good, being the same as that of wounded Germans in the hospital. At the Hôpital Malines were seventy non-commissioned officers slightly wounded and three badly wounded. They were being cared for by two British doctors (Major Ralph Walter Ganderson [?Ralph Waldo Gunderson] and Major Donaldson Norman Stuart [?William Norman Stuart Donaldson]. Here again the medical care and the food were good. At the Military Hospital, No. 60, Ghent, there were 200 slightly wounded, twenty-nine more seriously, and seven not able to be moved; two British doctors were in charge (Major J. C. Steel) [?G. C. Steel] and Major H. R. Fosbery. Treatment was reported good and food sufficient. On their recovery and dispatch to German camps the men receive from the Belgian Red Cross a double set of underclothing. At the English Hospital in Enghien in Belgium there were 450 wounded, twenty-nine seriously. Here there was a large R.A.M.C. personnel—twenty-four officers, twenty-three non-commissioned officers, and eighty-three privates belonging to the Field Ambulance General Hospital 17/21. It is mentioned that the R.A.M.C. officers receive pay. The daily ration includes about 8½ oz. of bread, nearly 2 oz. of meat, and the same quantity of fats.

At two Paris hospitals, Hôpital Valdegrace and Hôpital Bejin, there were eighteen and fifty wounded respectively, and care, food, and treatment were good. At the Hôpital Ernemont at Rouen there were 123 wounded, of whom sixty were officers; fifty-nine were badly wounded. There were five British doctors at this hospital, the chief of whom was Major W. L. Kinnear, and twenty-four male nurses. Here again there was a good report as to care, food, and treatment.

The civil internment camp at St. Denis was also visited by Dr. Junod. Here 1,611 civilians were found in satisfactory living conditions. The morning ration included 1/2 oz. coffee and 1¼ oz. sugar; midday, vegetable soup and nearly 2 oz. meat; in the evening, coffee or sometimes tea, cheese, sausage, and about 2 oz. marmalade or 1 oz. butter. The Swiss Red Cross has sent a consignment of condensed milk for the aged and sick. There are seven British doctors and dentists in the camp, and there is a good hospital. Health and sanitation are satisfactory, and the equipment includes shower baths. The chief need of both the wounded and the interned seems to be soap.

Dr. Junod's assistant, Dr. Marti, has visited a number of camps for airmen prisoners. It is not certain where these camps are located, possibly in Germany itself. One of them consists of three wooden barracks, comfortable, heated, and protected against fire. The food is good, and the canteen sells fresh vegetables. The sanitation includes provision for hot showers, and there is plenty of space for exercise. In this camp there are 231 non-commissioned officers and fifty-seven privates. In another camp, where there are 126 officers and fourteen other ranks, the barracks are similar to the first, with comfortable rooms for two or four men. It is said that there are no complaints regarding food, and there is a well-stocked canteen. One hospital with a German doctor is shared by both these camps. At the time of inspection there were three airmen prisoners slightly ill. There had been no deaths.

Another camp for airmen, accommodating rather smaller numbers, consists of three large heated barracks, with rooms having one to three beds, and hot and cold water running. The food is good, similar to that of German officers at the camp, and there is a well-stocked canteen. In the hospital here there are twenty-three airmen, all nearly recovered except one badly burned and one wounded by bullet. One camp is divided into *Oberlager* and *Unterlager*, the former accommodating forty-four naval and forty-six army officers, with twenty-two other ranks, and the latter eighteen staff officers, 131 field officers, seventeen doctors, and forty-four other ranks. The food here is said to be plentiful and well chosen, giving 3,700 calories per day. Five officers wounded by bullets will be repatriated when possible.

INDIAN MEDICAL SERVICE

Recruitment of Emergency Commissioned Officers

In view of the expansion of the Indian Army the Government of India wish to recruit a considerable number of doctors in the United Kingdom for service as Emergency Commissioned officers in the Indian Medical Service for the duration of the war. The conditions of service of such officers have recently been revised, and the Government of India are now prepared to accept doctors up to 45 years of age for war service subject to their being considered suitable and physically fit for service in tropical countries. Emergency Commissioned Officers of the Indian Medical Service will be eligible for acting and temporary promotion above the rank of lieutenant appropriate to the duties which they are called upon to discharge, in the same way as officers of the R.A.M.C. Officers with specialist qualifications who are appointed to specialist posts will thus be eligible for acting rank appropriate to their duties. Pay will be at the same rates as for officers of the Indian Medical Service in peacetime, and passages to India at Government expense will be provided for officers but not for their families. Candidates will be required to attend at the India Office for interview and medical examination before being finally accepted for appointment. Those interested in the Indian Medical Service should address any inquiries to the Medical Adviser, India Office, S.W.1.

GAS DECONTAMINATION AT FIRST-AID POST

The Ministry of Health considers that the arrangements at many first-aid posts for the decontamination of gas casualties are inadequate and will be ineffective in action. Local authorities are therefore asked in a recent memorandum to review at once the facilities they have provided for this purpose. *A plan, with details of the lay-out, of a model* cleansing unit at a first-aid post accompanies the memorandum, and any new unit which it may be necessary to erect should conform to this model. Existing first-aid posts should be adapted so far as possible to provide the essential features of the model, which are as follows. Each unit should have four compartments: (1) an outside stripping shed, which should, of course, be above ground; (2) an inside undressing room; (3) a washing or shower room; (4) a dressing room. The object is to prevent the spread of gas vapour from the stripping shed onwards; the four compartments should therefore be sealed off from one another, and intercommunication effected through doorways covered with blankets, which should be wet when in use. Each compartment should have cross-ventilation. The memorandum concludes by pointing out that concentrations of gas may occur near first-aid posts, and that unless other suitable measures have been taken blankets should be placed in position on fixtures over all outer doorways, to be lowered immediately when necessary.

Correspondence

Medical Planning Commission

SIR,—The British Medical Association has indeed given its members a fine New Year's gift in announcing the formation of this body. It pleases me not only because it is our natural contribution to the national effort to show that "Britain carries on," but because it is an unmistakable sign that our Association is very much alive. A body which, while immersed in war work and with its working members and staff heavily strained, can plan for the future on this scale has every right to be proud of itself. This is the kind of initiative that we have a right to expect from the body which represents every class of our profession as no other body does. We shall follow the work of the Commission with great interest and the assurance that its composition guarantees zeal, competence, and comprehensiveness.

One point in your announcement particularly interests me—that is, the assurance that the visions and aspirations of the younger men and women will not be overlooked. I am the last man to undervalue experience, but there is always a risk that the minds of the older men, particularly when habitually immersed in medical politics, will become *polarized*. It is not easy for such men to get away from the ideas and technique of our "Proposals for a National Medical Service." But it must be done. The world has moved fast and far since these proposals were formulated. The Association has had a good deal of criticism from certain quarters, not altogether unmerited, for its lack of initiative in dealing with the shelter question and the Ministries in charge of it. I hope that this will receive the attention of the Commission and perhaps stimulate it to make an *interim report on how to deal with a* problem which is certainly a "wartime development" and which may have marked effects on "the country's medical services." Our Association has tackled many big things in its time. It never had anything more worthy of its steel than this.—I am, etc.,

Henley-on-Thames, Jan. 5. ALFRED COX.

R.M.B.F. *Christmas Gifts*

SIR,—It is with great pleasure that I inform you that we distributed £1,032 in Christmas gifts this year. This means a monetary gift to all our regular beneficiaries—deeply appreciated and valued by each one of them.

Will you please accept my warmest thanks for the help you gave in publishing my appeal and convey to your readers my sincere gratitude for their kindly and generous response.

I am sure that it is an encouragement to us all that the medical profession is so loyally supporting the Royal Medical Benevolent Fund and enabling the good work to be carried on at the present time, when the hardships of many are very great.—I am, etc.,

Royal Medical Benevolent Fund, 1, Balliol House, Manorfields, Putney, *London, S.W.15, Jan. 1.* THOS. BARLOW, President.

Tuberculosis and Shelters

SIR,—The issue of Circular 2231 of the Ministry of Health, which deals *inter alia* with the question of tuberculous persons frequenting shelters, compels me to return to some of the points raised in my letter published in your issue of November 2, 1940 (p. 608).

Naturally I welcome the fact that serious consideration is now being given to the danger to the general public. I regret, however, that in the accompanying letter from the Chief Medical Officer the danger to the patient appears to be considered chiefly from the angle of persuading him not to frequent public shelters and that the provision of satisfactory alternatives which will not be detrimental to his own or his family's health has received scant attention. To ask a tuberculous patient and family to use Anderson shelters is to court disaster only secondary in degree to the risk involved in the use of crowded public shelters. The conditions in an Anderson shelter, damp and badly ventilated, are conducive to cough, and the crowding of the family into such a confined space exposes susceptible persons to concentrated risk. Such a policy is directly contrary to all that the tuberculosis service has tried to achieve in recent years in the way of relative isolation of infectious cases, and I for one will take no part in it. It is unreasonable, on the other hand, even if an Anderson shelter were not harmful to the patient himself, to expect him or her to occupy it alone.

With regard to compulsory removal to hospital, I know that the London County Council is trying to increase its bed accommodation to meet the anticipated need, but at the present time it is often a matter of considerable difficulty to get hospital vacancies even for willing patients. Moreover, with the incessant propaganda about the supposedly deliberate bombing of hospitals and the undoubted fact that many of the hospitals are situated in vulnerable areas, it is becoming more difficult to persuade patients to enter hospitals at all willingly.

Tuberculous patients are human and are generally recognized to be more emotionally unstable than the average person. They want security as much as anyone else. The realist solution is to allocate or provide adequate relatively safe shelters for tuberculous patients which will be attractive enough to overcome the dislike of segregation. Otherwise there will be an increased tendency to the hiding of the disease, the conversion of the tuberculosis officer into a policeman, and the disappearance of patients from dispensary supervision.

In London, particularly in the City and surrounding boroughs, there is still a large number of relatively safe buildings not yet fully utilized where it would be possible to establish something in the nature of "night sanatoria," which would probably obviate the necessity for compulsory removal to hospital with its resultant congestion of beds and the confinement of ambulant patients for unlimited periods in wards which would become little more than prisons. The good will and co-operation of patients would be more easily secured if they felt that something was being done for them and the public would be more fully protected.—I am, etc.,

London, E.2, Dec. 30. C. K. CULLEN.

The Problem of the Shelters

SIR,—It appears that Mr. H. Mason (December 28, p. 917) does not realize that the two-stage or Haldane shelter, recommended by the A.R.P. Co-ordinating Committee, is not a "deep" shelter. As shown in the plans, it is a surface shelter, although it may be built below ground. Drainage should therefore present no difficulty. Mr. Mason may think that the adoption of this type of shelter would be disastrous; but it has been passed by the Ministry of Home Security as eligible for grant to local authorities. Also it is recommended by the Association of Architects, Surveyors, and Technical Assistants.

The shortage of labour and material mentioned by Mr. Mason provides a strong argument in favour of large communal shelters, since the larger the shelter the less is the material needed to provide a given standard of protection. A shelter in every home would provide many advantages: but the labour and material required to provide adequate protection would be prohibitive.—I am, etc.,

Jan. 2. J. R. MARRACK.

Convulsion Therapy in Out-patient Department

SIR,—Dr. E. Cunningham Dax's case (December 21, p. 878) against the treatment of out-patients by electrically induced convulsions is strongly supported by the following.

A spinster aged 46, described as a healthy person and as a popular and keen school-teacher before her present illness, became depressed after her mother's death in January, 1940. She lost weight, seemed apathetic, and reproached herself for imaginary neglectfulness and sins. When admitted to the Crichton Royal in May, 1940, she was agitated and sleepless. She constantly talked about her worthless and sinful life, blamed herself for her mother's death, and was sure that the police suspected and persecuted her. There were no physical findings except for a blood pressure of 166/90. Convulsion therapy seemed indicated because of the excellent results we had from it in similar cases of involutional melancholia. Between June 6 and 21 the patient received eight injections of triazol (azoman), six of which produced epileptic fits. The dose required for a complete reaction was 2 c.cm. of the 5% solution. There was some restlessness after the injections not followed by a fit; on three occasions the fit came on after a delay of some five to ten minutes. Nothing unusual was observed. After four fits the patient showed definite improvement; she seemed much more settled, conversed rationally, and was able to attend occupational therapy. Early in July she began to relapse. Delusions returned and were freely expressed; she made two suicidal attempts, and again became restless, although not to the extent she was on admission. The following four months brought no change. As the patient dreaded further injections, it was decided to apply electrically induced convulsions. Using the method and machine described by Fleming, Golla, and Walter (*Lancet*, 1939, **2**, 1353), she was treated with increasing doses on December 13, 16, and 18. Each day two attempts were made and none was followed by an immediate fit; but half an hour after the first treatment the patient, having meanwhile walked back to her wards, had a typical major fit while sitting at the fireside. Nothing happened after the two trials on December 16. On December 18 she had the maximum dose twice (duration 0.5 second, scale reading 100, resistance 550 and 450 ohms). A first fit occurred three hours and a second one approximately eighteen hours after the application of the electric current. On December 22 the blood pressure was 160/105.

This may be a unique observation; we have seen nothing similar among sixty patients treated by this method at the Crichton Royal up to the present. However, confusional states with or without aggressiveness and violence, exacerbations of depressive or manic episodes are not rare, and justify Dr. Dax's warning against the light-hearted application of the method. Much as I agree with this point of his letter, I cannot see why one should not make full use of the opportunity provided by convulsion therapy to teach students the differential diagnosis and treatment of the epileptic fit, so important in general practice.—I am, etc.,

Dumfries, Dec. 27. W. MAYER-GROSS.

Closed-plaster Treatment of Wounds

SIR,—The admirers of the genius of Prof. Rutherford Morison are indebted to Dr. Wm. McKenzie (December 28, p. 917) for his pertinacity in advocating the recognition of Morison's work. When home on leave during the last war I saw some of Morison's original bipp cases under treatment; these included patients with compound fractures who had lain out "in no-man's land" in Flanders from two to five days before treatment was initiated. The results of the treatment were remarkable; in fact they were startling. Morison claimed, and justly claimed, that he had discovered a new principle in surgery, where for the first time a septic wound could be successfully treated, sutured up without drainage, and remain undisturbed for several weeks. It is suggested that bipp only acts as a deodorant; such a statement is wholely incorrect. Morison claimed that the therapeutic effect of bipp was due to nitrous oxide liberated from the bismuth subnitrate, which acts upon the iodoform, thus liberating a constant flow of free iodine in the wound. And it was the constant action of this free iodine that had the beneficial effect.

That the bipp technique has not been more widely employed is entirely explained by the failure of those using it to carry out the technique correctly, as laid down by Morison. The surgeons who have not met with success were those who tried to improve on the procedure by washing out the wound with antiseptics of various kinds. Had these surgeons adhered to Morison's detailed technique of using a 1 in 20 solution of carbolic acid for the *outside* of the wound, and only allowing spirit. vini rect. *inside* the wound, how different would have been their results! To crab the method when the correct technique was not followed is so unfair; success can usually be assured if Morison's technique is followed without variation. The dispensing of the bipp is an important detail. The proper consistency of bipp is that it should be gritty when rubbed between finger and thumb. If too much paraffin is used the paste is too greasy; it will not adhere to a wound surface, so it cannot act; therefore bipp made up in a collapsible tube is useless. It should be stored in porcelain containers.

Morison always stressed the necessity for excising dead or damaged tissues as part of his technique, and that the bipp be rubbed into the tissues, any excess of the paste being removed before closure of the wound. All injured and treated limbs were fixed by firm bandages or by splints or by plaster-of-Paris. After my return home from the last war in 1919 I carried out Morison's technique in my emergency operations associated with sepsis at the Royal Victoria Infirmary, Newcastle-upon-Tyne, particularly in cases of appendix abscesses. During the operation the cut abdominal wall muscles were mopped with methylated spirit and scrubbed with bipp before the abscess was opened into, with wonderful results. After practising this method for six months I reverted to the old method in these cases. Two weeks later the sisters of my male and female wards jointly asked if I would resume the bipp treatment, for two reasons: (1) the less work entailed for dressings, which was once every two to three days in the bipp case compared with once every four to six hours in a non-bipped case; and (2) the lessened cost of dressings in the bipp cases. Further, every compound fracture since the same date has been treated by the bipp technique and the wound closed without drainage: in no single case have I had cause to regret the absence of a drain.

Prof. Morison discovered and practised a new principle in surgery, which included excising the damaged or dead tissue, closure of the wound without drainage, fixation of the damaged part, together with the application of an antiseptic paste from which comes a continual beneficent emanation of free iodine. I consider he was a pioneer in all these points and should not be deprived of the full credit for them.—I am, etc.,

Newcastle-upon-Tyne, Jan. 2. R. J. WILLAN.

SIR,—The application of the term "closed-plaster treatment" to the method associated with the name of Winnett Orr is unfortunate, as emphasizing, at the expense of fundamental principles, one detail of technique, and that a not universally satisfactory one. The undoubted success of the method depends on the application of these surgical principles: (1) excision of the wound in suitable cases, with removal of foreign bodies; (2) the establishment of free drainage, the wound being left widely open; (3) the avoidance of unsuitable antiseptics; (4) immobilization; and (5) avoidance of frequent dressings. The importance of immobilization can scarcely be over-estimated, but plaster is not always a wise method of fixation, especially if the circulation is in doubt. If a plaster is used it should not necessarily be of the closed type, notably if excision has been imperfect or skeletal traction has been applied.

The object of this letter is not to decry the use of plasters in general or of closed plasters in particular—far from it—but to condemn the implication in the term "closed-plaster treat-

ment" as applied to the present-day treatment of wounds. Unfortunately it has been observed that closed plasters are sometimes being used without thought of surgical principles.—I am, etc.,

Dec. 28, 1940 H. JACKSON BURROWS.

Hospital Infection of War Wounds

SIR,—I have read with particular interest Prof. A. A. Miles and his colleagues' interim report on hospital infection of war wounds (December 21 (p. 855) and 28, 1940 (p. 895)) and your leading article on the subject (p. 908). The open ward, housing a number of patients, favours cross-infection. This fact is well known to those in charge of fever hospitals. It has been found that the relapses of scarlet fever cases during the third to the sixth week are mainly due to a reinfection with a different serological type haemolytic streptococcus. These relapses can be prevented by an "aseptic" technique of nursing and the precaution of treating the patient in the cell of a chamber-ward. This type of ward is probably the ward of the future for both fever and surgical cases. The time has come when we should radically alter our conception of the design of hospital wards. The lesson which we are now re-learning should not be again lost when we start rebuilding our hospitals.—I am, etc.,

G. E. DONOVAN.
Gorseinon, Swansea, Dec. 30. Medical Officer of Health.

Sulphonamides in Treatment of Bacillary Dysentery

SIR,—Dr. J. Drummond's letter (September 14, p. 367) reminds me of a case I saw in July last which may be worth mentioning. The patient was an American negro in the City Hospital, Welfare Island, New York City, and when I saw him he had been there about ten weeks, I believe. He had dysentery with only about four or five motions a day, all containing blood and mucus, which no form of treatment did the slightest good to; *B. flexner* had been cultured from the stool. The most alarming feature, however, was a swinging temperature rising to 102° F. or 103° F. every day. He had had serum, salines, kaolin, intestinal "antiseptics," and many other forms of treatment. The doctor in charge of him, Dr. Greisman (I believe at the suggestion of the house-physician), decided that there could be no harm in trying sulphapyridine, and the patient was given 3 grammes a day. From the next day the temperature never rose again, and the dysentery stopped abruptly. The man was quite well a couple of weeks later, but I do not know the subsequent history.

I may mention that I have not been able to duplicate this happy result in this country. In fact, cases of bacillary dysentery to which I have given sulphapyridine and sulphanilamide have shown no improvement at all.—I am, etc.,

S. BETTENCOURT-GOMES.
Demerara, British Guiana, Nov. 23, 1940.

A Sound Wartime Dietary

SIR,—As the most wholesome, *complete* diet, known to have bred a race strong in brawn and brain, there is everything good to be said for the Scottish ploughman's "filling" fare of oatmeal made into porridge, brose, or bannock, broths in quantity containing any and every root and green vegetable, and potatoes cooked in several simple ways, commonly stoved with fat and onions, these washed down with a flagon of milk: a diet costing him exactly nothing in cash! On occasion he was known to allow himself the luxury of a red herring. On this diet Robert Burns, that prince among poets, was nurtured, and subsisted all his days.—I am, etc.,

Bournemouth, Jan. 1. S. WATSON SMITH.

Oranges and Tomatoes for Infants

SIR,—The present shortage of oranges creates a problem in infant nutrition. May I suggest that you make known through the Press, etc., how important it is that what oranges are available should, if possible, be reserved for babies.

The use of tomato juice as an alternative is not sufficiently known to mothers, although supplies of this, even in tinned form, are, I believe, limited; but the knowledge of this fact and the restricted use by the general public of oranges may save a number of wartime babies from nutritional deficiency diseases.—I am, etc.,

Reading, Dec. 27. W. IVOR BAIN.

The Shock of the Ambulance Journey

SIR,—Mr. D. G. Duff (November 9, p. 647) writes to say: "I am not certain that, even at this stage of the war, it is fully realized how shock-producing an ambulance journey may be." This fact was well recognized in the war of 1914–18, and has been ever since a part of the R.A.M.C. training. In the *Journal of the Royal Army Medical Corps* of last September I stated in this connexion: "All transport must be as smooth as possible. Smooth running can be helped by reducing the pressure of tyres over bumpy roads. The speed of the ambulance should vary according to the surface; bends and corners should be approached at a speed that will not cause swaying of the vehicle. Loading and unloading must be carried out as gently as possible, and the patient must never be submitted to sudden jars."

I have quoted this because from Mr. Duff's statement it is obvious that the present organization for distributing medical knowledge to all practitioners is not sufficient. No doctor takes all the medical journals, and in consequence a number of doctors never have the opportunity of getting to know about some new and important medical knowledge for a long while after it has become the common property of a few. In the meantime their patients fail to benefit from this new knowledge as quickly as they have a right to expect. This brings up the point that complete co-operation for the common good among the medical profession is not catered for at present. This could be altered if a committee was appointed to sift all new medical knowledge, and their findings be published in all medical journals.

At the moment, would it not be advisable to publish in all the journals an authoritative statement on the treatment of war casualties as it affects all doctors, and not from any one specialist's point of view? This should also include exactly what to teach as first aid, as it appears that in this connexion "a little learning is a dangerous thing."—I am, etc.,

R. R. G. ATKINS,
Dec. 3. Colonel, R.A.M.C.

The Methods of Statistics

SIR,—In times of national stress it is sometimes suggested that the medical profession ought to play a larger part in dealing with the nation's problems. It is easy to understand anyone taking this view, but less easy to see the part that individual members of the profession might be expected to play. It can hardly be doubted that a satisfactory solution of many of the nation's problems necessitates a great amount of preliminary research over wide fields, both medical and economic, and it is to be expected that in the post-war years the need for research will be greatly increased. In his fairly recent *Philosophy* Prof. H. Levy stresses the need for widespread research, and specifies a number of "social variables" requiring investigation in the interests of mankind.

Possibly the best contribution medical practitioners could make towards the solution of national problems would be to convince themselves of the urgent need for research, and to use their special opportunities to rouse the interest of others with a view to getting this carried out. Unfortunately statistical investigations often fail to interest those who have no knowledge of the method of statistics. A knowledge of these methods, on the other hand, often creates an interest in research. At present there is evidence of a desire on the part of the lay public to know something of the methods of statistics. At Glasgow a course of twelve lectures on the subject is open to the public, and no doubt similar courses for the public are being given elsewhere. In the medical profession, apart from those engaged in public health or in research, it can hardly be said as yet that a knowledge of these methods is widespread.

It is possible that the time will come when medical students will be required to have some knowledge of them as part of their educational equipment. A preliminary course of

instruction, given in association with the lectures in biology, would have some value in developing the critical faculties of the student. There are, perhaps, few of the later subjects in the medical curriculum which could not be revitalized to some extent and pruned of some unnecessary dogmatism by frequent reference to some of the concepts of statistical theory. It would be an advantage for the student to be introduced to the subject at a time when he has not yet begun to forget his mathematics. Once he has realized that he is acquiring an instrument that may be of service to him throughout his career, he may feel the urge to follow up the subject in the interesting and hitherto fruitful field of statistical mathematics. Here he may find beneficial mental discipline and, perhaps, aesthetic satisfactions. Others would at least learn enough perhaps to appreciate the advantages of taking a special course later. Even if the student should never have occasion to carry out a single statistical investigation of his own, his instruction in the methods will have been justified if he has been enabled thereby to take an interest in the researches of others, medical or otherwise, and to appreciate the implications of their results.—I am, etc.,

Paisley, Dec. 28. A. GARDNER.

Local Injections in Muscular Rheumatism

SIR,—I was very much interested in an article by Mr. Martin Button on local injection as a means of rapid restoration of function in muscular rheumatism (August 10, p. 183). For the last three months I have also treated by this method about twenty cases of lumbago, one case of sciatica, two cases of supraorbital neuralgia, and one case of severe muscular spasm of the flexor sublimis digitorum, with excellent and, as Mr. Button rightly says, surprisingly quick results. Instead, however, of using large quantities of novutox, as Mr. Button does, I have been able to get very good results by small injections of the oily preparation of Allen and Hanbury known as proctocaine. Of this I have never used more than 1½ c.cm., while in most cases I have used much less, the largest quantity being required in cases of lumbago.

In selecting the sites for injections in lumbago I have found Mr. Button's method the best. I generally ask patients as to the one position which brings on maximum pain on movement, and then mark out points of maximum tenderness on deep pressure (there are generally more than one); exact location of these is of great importance in getting the best results. Having obtained these, and with careful skin sterilization, I inject about 5 to 6 minims into the muscle substance with a needle, going at least half an inch deep vertically. At each of these tender points the process is repeated. Then the injected parts are well massaged and a collodion or benzoin dressing put on. The patient is then asked to get up and told to assume the position which gave him acute pain before the injection. His relief and surprise are extreme when he finds the pain almost gone. He is then made to do an exercise which in India is known as "oothbess," which is to sit on one's haunches and get up, doing that several times. Patients who come to the out-patient department walking with the greatest difficulty on sticks, doubled up with pain, have left walking straight without support after the injection. Of all the cases of lumbago on which I have tried this treatment I have not yet had a single failure. The injection itself is not at all painful, as Mr. Button finds with nuvotox, and that, I believe, is owing to the absence of adrenaline in proctocaine.

The two cases of supraorbital neuralgia were very bad cases. In one a young Mohammedan lad of 20 said: "For the last fifteen days I have night and day a pain in the right side above the eye, and about midnight I get it so intense that I am like a madman, waking up the whole house, allowing nobody to sleep." He was locally treated with heat diathermy, etc., but with no benefit, and analgesics and sedatives had no beneficial effects. After making sure that no frontal sinus or antrum infection was responsible for the pain, I injected only about 2 minims of the proctocaine solution as deep as I could go under the skin, obliquely with the needle pointing upwards and outwards just a little above the supraorbital notch. The part was then massaged. The next day he came quite relieved of his pain, having slept the first night peacefully. There was some swelling in the region of the injection and a slight puffiness of the upper lid; these all disappeared in two days, and he has not so far (after two months) had a relapse. Another case was of a similar nature and got immediate relief, but a month later there was a slight relapse, which, however, was controlled by soda salicylates in large doses.

The sciatica case, as Mr. Button terms it "pseudo-sciatica," was of two months' duration, and one injection of 1 c.cm. sufficed to relieve the pain. I have not yet tried so far the remedy in stiff neck cases nor in deltoid rheumatism, and was much interested in Mr. Button's experience of such cases.—I am, etc.,

Bombay, Nov. 11. N. H. VAKEEL.

"Egyptian Tummy"

SIR,—Dr. H. M. Stanley Turner (December 14, p. 850) rightly states that I ascribe this ailment to meteorological causes—that is, to a low relative humidity and active chilling of the body surface (December 7, p. 806). A similar ailment in Northern Egypt, he states, is due to a mild bacillary dysentery—usually the Flexner γ bacillus. I cannot state whether this bacillus was or was not present in any of my cases in Upper Egypt, as no bacteriological examination was ever made of the stools, as I always found that the treatment I have indicated cured and prevented these ailments in a short time provided that steps were taken to prevent the action of the climatic conditions to which I have drawn attention.

I will illustrate this by a case at Assuan of this ailment, treated at first by a colleague. The patient was a lady travelling with a friend, who acted as nurse. After some days' illness I was asked by them to come to see her; meeting my colleague, I informed him of this request. He said, "Do so by all means; it won't make any difference, as she will die in the night"; and the next day a consultant physician resident in Assuan told me he had taken a very serious view also of the case. I found the patient weak and in distress from very frequent stools, with mucus and blood. To my amazement she was lying in a thin nightdress, perspiring, on the bed; the cold north wind, entering by a window, passed across her body and out by an open south window. A warm Turkish towel was ordered to be fixed round the abdomen, and treatment and diet as suggested in my previous letter were instituted. She recovered completely, and I dined with her and her friend some eight to ten days later.

I still maintain the climate is the determining cause of the illness and its course.—I am, etc.,

Dec. 24. LEIGH CANNEY.

SIR,—From severe personal experience of "gippy tummy" in the early days of my service in Egypt I found that the condition arose as a result of nocturnal abdominal chill. In the Nile Valley and adjoining desert there are very great daily variations of temperature up to as much as 60° between the maximum and minimum in twenty-four hours.

After experimenting I found that the condition did not occur if I wore a cholera belt from sundown right through the night, and once I had made this discovery my troubles were over. I also persuaded a number of other sufferers to do the same, and I never found it necessary to order special diets, to give medicines, or to recommend removal from the climate of Egypt or the Sudan. The cholera belt can be improvised out of towelling, a scarf, or any other material that can be wound round the abdomen, and nothing else is needed to prevent this tiresome, "colicky," urgent intestinal upset. Natives often use their turbans to protect the abdomen at night.—I am, etc.,

Dec. 31. V. S. HODSON.

Euthanasia

SIR,—I do not suppose you would wish for much discussion of this problem at the present time. I feel, however, that the collective wisdom of experienced family doctors has never been sought. They alone have the practical and expert knowledge. I believe the majority of them would see little need for legalization, and could find many convincing arguments against it.

hormone therapy in BURNS & SCALDS

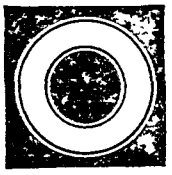
". . . During the past five years 76 burns and 322 scalds have been treated by one unit in the Royal Hospital for Sick Children." *(By various methods).* "The average age of the patients was 2½ years . . .

". . . The results during the past year have completely justified the use of a side ward solely for the treatment of burns and scalds.

"Desoxycorticosterone acetate* has proved very valuable in the treatment of toxæmia, and I advocate its use in all cases which develop this complication of burns."

see Lancet, pp. 1107-1110, November 25th, 1939

*DOCA was used in this investigation



DOCA

desoxycorticosterone acetate

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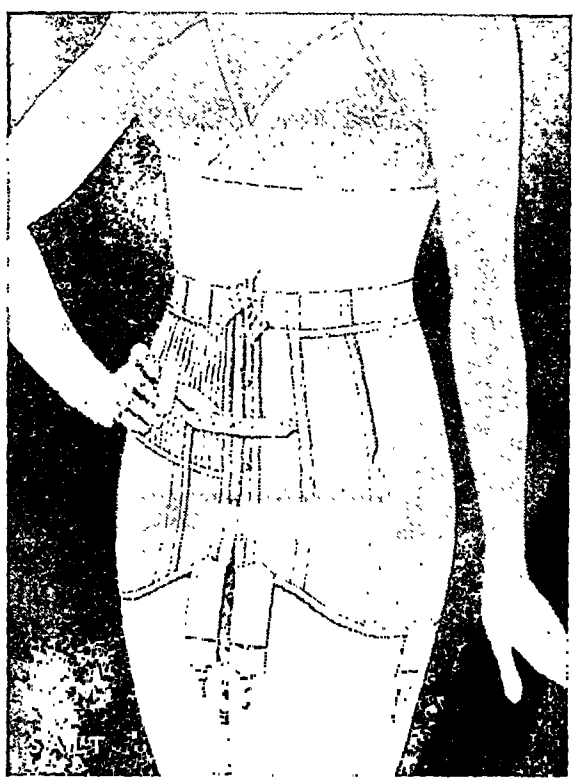
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An inevitably fatal result can perhaps be diagnosed with reasonable certainty. Pain cannot be assessed by the doctor, but it can be relieved. Misery and the desire to be put out of it have little relation to actual pain; they are not constant from day to day, and are expressed many times without real inward conviction; they may be dispelled by a happy chat about old times. An invalid, like a child, may have the whole mental outlook influenced by those around. Discomfort, almost unbearable, is relieved by improved nursing. Mental distress may be a reflection from or on those who are in charge.

Pain in malignant disease may be severe, but in many cases this is not for very long periods; the case may drift on to a stage when there is much less pain but there is a desire for morphine. If the patient knows that reasonable dosage will be forthcoming at the right time, but understands the wisdom of spacing it out, there will not be so much evidence of apparent pain. It is true that this may leave a poor hopeless specimen being doctored and nursed, but both these professions gain something by rising to the occasion. They need not try to prolong a life that is coming to a natural end. If voluntary euthanasia were made legal, there is another side to the picture. A doctor dealing with an urgent, hopeless case might have less freedom with regard to dosage if some judicial authority were in the background, jealous of prerogative. The family doctor could recount some strange social complications—for example, in relation to re-marriage—and there may be legal responsibilities about the date of decease. Social and important economic problems are capable of being solved legally, but they might lead to social and mental ruin of someone left behind, who, with altruistic motives at the time, had acted on narrow, limited medical advice.

With regard to hospital cases the question of publicity and reputation is all-important. It is possible that one group of hospitals would decline to undertake the responsibility, and another group, who felt they were doing the right thing in giving the facility for euthanasia, might be placed in a difficult position in the matter of their good name for sympathetic nursing and their prestige. If practically all hospitals and most of the profession become more closely associated with the State, it might be unwise to bring forward legislation for a contingency which arises rarely and does not depend entirely on the natural history of the disease in question.

I am so convinced that the majority of good general practitioners would not countenance voluntary euthanasia that I believe many of them would feel compelled to set up some organization which bound them not to be associated with it, so that they would be protected from the many difficulties which they and their patients might otherwise fall in with if euthanasia were legalized. I believe that a wise patient who really understood would not subject his relatives or medical advisers to making a decision the responsibilities of which would live when he had passed away.—I am, etc.,

Derby, Dec. 27. HUGH BARBER.

SIR,—Dr. D. Kelleher (December 21, p. 880) suggests that the problem of the "incurable person in pain can be very simply overcome by the giving of morphine," and he goes on to argue from this that euthanasia is wrong. Surely this is not quite the way to look at it. The giving of ever-increasing doses of morphine becomes anything but simple, and the state of the morphine-poisoned patient is very pitiable. In the end the patient dies of morphine poisoning—a very barbarous form of euthanasia.

This matter is one of very great importance, not only for the patient with incurable painful disease but still more so in the case of idiot children. I feel, when I visit one of the homes where these little sufferers are boarded out, that their continued existence cries for action. I think there are very few people who would wish to prolong these lives if they could but see some of the cases.

It is because human life is so sacred that some people feel that no travesty of it should be allowed to continue. It is, admittedly, a very large and difficult question, but it is not too soon for the gravest thoughts and consideration to be given to it.—I am, etc.,

Hendon, N.W.4, Jan. 1. R. W. COCKSHUT

[*** This correspondence is now closed.—ED., *B.M.J.*]

Adrenaline in Asthma

SIR,—I have read with interest Dr. George Krasner's letter (November 16, p. 684) on the treatment of adrenaline-resistant cases of status asthmaticus, and I note that a correspondent confirms that such cases occur. I have had such a case, which did not improve in the slightest under the method suggested by Sir Arthur Hurst, and in which, after warning the relatives of the dangers of morphine, the latter was used, and for a time the patient—apart from the asthma—was gravely ill as a result. Sir Arthur does not mention any failures with his regime, and one would be interested to hear whether he has anything to suggest, if he has had any.

Finally, Dr. Krasner mentions more than one method of treatment, so presumably, as is to be expected when asthma has different causes, none of these is infallible in any one case. It would be of general interest, no doubt, if Dr. Krasner could be invited to explain the following points: (1) Can the pathological conditions which cause the different types of status asthmaticus be diagnosed clinically from the history or examination? (2) If so, are any of the different methods of treatment applicable particularly to a particular pathological state? (3) Are there any other indications for the selection of the method of treatment, any contraindications, or anything noteworthy in the method of administration?—I am, etc.,

Edinburgh, Dec. 17. M. PARK.

Medical Examination of the Home Guard

SIR,—I have been surprised that there has been no medical examination of recruits for the Home Guard. We are told that the Home Guard is the second line of defence in the event of invasion, and, if so, it is reasonable to expect that our defenders shall be sufficiently fit physically and mentally to carry out their duties. At present, from my own experience in a country district, anyone volunteering for the Home Guard is accepted.—I am, etc.,

Llanfyllin, Dec. 18. L. J. FORMAN BELL.

Pathogenesis of Non-pulmonary Tuberculosis

SIR,—May I correct an error which inadvertently crept into my article on the "Pathogenesis of Non-pulmonary Tuberculosis" (November 16, p. 660), and refer also to two matters discussed by correspondents?

A follow-up report was obtained concerning eighty-one of 110 patients suffering from tuberculous cervical adenitis and twenty of forty patients suffering from tuberculous abdominal glands, a total of 101 follow-up reports, not eighty-one as stated. These follow-up reports were completed towards the end of 1938, and although they referred to patients discharged from several months to seven years before that date, no further development of disease in these patients has come to my notice during the ensuing two yeras.

Drs. F. A. H. Simmonds and Brian C. Thompson (November 30, p. 766) refer to Dr. Thompson's exhaustive and accurate study of 324 patients suffering from tuberculous adenitis, and quote it to refute my suggestion that "patients suffering from gross tuberculous adenitis do not under favourable conditions develop tuberculosis in other parts of the body." In his article, however, Dr. Thompson emphasizes the very unfavourable economic conditions prevailing in the area from which his cases were drawn. He adds that only 109 of his 324 patients were admitted to hospital or sanatorium for observation or treatment. The conditions, therefore, were very unfavourable. The distinction I wished to draw is easily demonstrable in a sanatorium in which both pulmonary and non-pulmonary tuberculosis are treated. Many children have been treated here for tuberculous adenitis during the past ten years; many young adults unfortunately are still being admitted suffering from phthisis, but none of these are the children whom we treated for tuberculous adenitis.

Dr. A. G. Auld's experience (December 7, p. 808) of a patient whose pulmonary tuberculosis abated after the incursion of the complication of tuberculous lymphadenitis is interesting. I have looked through the register of more than 4,000 patients who have been admitted to this sanatorium during the past ten years, and found record of only one patient classed as

"T.B. + 11," who had a tuberculous cervical gland. I venture the opinion that Dr. Auld was right when he attributed significance to his case.—I am, etc.,

M. C. WILKINSON,
Medical Superintendent.

The Sanatorium, Black Notley, Braintree; Dec. 18.

Rationalization of the British Drug Industry

SIR,—Much can be said about the annotation entitled "Rationalization of the British Drug Industry" which appeared in your issue of December 21 (p. 875), and I would like to draw your attention to the following points.

Whatever may be said about the names adopted in the Addendum to the *B.P.*, they must be admitted as being reasonably terse and sufficiently indicative of the products to render them really useful, but if the medical profession has a preference for the original German titles we might well ask why they have not adopted them, as was the case with aspirin during the last war. Really the medical profession has not shown very much interest in the niceties of pharmaceutical nomenclature. For instance, those acquainted with hospital practice will know that some eight years of official recognition of posterior pituitary extract and neoarsphenamine has made no difference to the names used in the wards, or, for that matter, those taught in some medical schools.

One admits, of course, that there is a valid argument against the use of a proprietary title for an official drug, or even for any new substance discovered by research workers in a hospital or a university laboratory, and the only remedy would appear to be for such institutions to patent the results of their researches and control any commercialization that may follow, as has been done with insulin. But one need only to cite the instances of halibut-liver oil and the new remedy for epilepsy to show that our commercial laboratories are just as likely to be affected in this way as those institutions we have mentioned. The problem of chemotherapeutic research is not going to be solved by the efforts of the Medical Research Council alone without taking into consideration the activities of the commercial laboratories in this country, some of which have the advantage of being able to call upon the medical knowledge and research available in American scientific institutions.

Another reference in the annotation which should be commented upon is that which points out that "soon after the outbreak of war the Board of Trade decreed that every industry must organize itself for export trade. Despite all this, the British drug trade remains a complex of belligerent minor States." It concludes by saying that "some order of rationalization must be carried out. . . . People who do not make order by their own efforts may have a new order forced upon them." The industry is taking every possible advantage of the present circumstances in its organization for the export trade, but it should be borne in mind that it takes more than a year to counteract all the effects of unrestricted foreign competition. The economies of the Nazi export trade are well known, and it is hardly likely that such a regime would be tolerated in this country.

Much more could be said, but it seems to us that many of the points raised are governed by higher politics and are outside the range of discussion.—I am, etc.,

P. ROCHE,
Editor, *Retail Chemist.*

Dec. 31.

Lymphatic Circulation in Septic Inflammation

SIR,—Since Trueta and Barnes (July 13, 1940, p. 46) propounded the theory that the principal advantage of the closed-plaster method lay in the production of lymph stasis, it has been evident that this unusual evaluation of the lymph flow in septic infection could hardly go unchallenged. The letter from Mr. A. C. F. Halford (December 28, 1940, p. 918), together with your illuminating leader on the subject (December 7, 1940, p. 788), embolden me to suggest that the effect of the closed-plaster method on the lymphatic circulation must be totally different from that envisaged by Trueta and Barnes. In attempting to explain the result of hypertonic sodium sulphate applied to a wound (*Lancet*, 1940, **1**, 216) I suggested indeed exactly the opposite—namely, that one of the chief virtues of this treatment lay in the reduction of oedema and improved lymphatic circulation by the clearing of the lymph spaces and capillaries, resulting from the osmotic shrinkage of the endothelial cells. Now, no one who has heard Trueta lecture and seen the results of the closed-plaster method can fail to be impressed with the success of this treatment. How, then, can these opposing theories be reconciled?

The normal lymph flow along the lymphatics depends upon two factors: (*a*) *vis a tergo*, in the shape of pressure of lymph in the intercellular spaces; (*b*) alternate squeezing and expansion of the lymphatic vessels. The latter depends upon two forces: (1) movements of neighbouring muscles; (2) pulsation of neighbouring arteries. In plaster fixation, with a limb wholly or partly enclosed in a rigid case, I suggest that the effect upon these factors will be as follows: (*a*) the *vis a tergo* is assisted, whatever the force with which the lymph is exuded from the blood capillaries; this force will be more directly conveyed to the lymphatic vessels in a closed space. (*b*) Although muscular movement is largely excluded the pulsation of the arteries will be communicated with special force to the lymphatics inside the plaster case.

Further, little attention seems to have been paid to the osmotic conditions obtaining inside a plaster case. Actually, we have a state of affairs in which any liquid exuded near the plaster is exposed to partial evaporation. The liquids to consider are lymph (or pus) and sweat (when uninjured skin is covered). Both these, when exposed to evaporation, must become of a much higher osmotic value than the cytoplasm of adjacent cells, so I further suggest that we have here a mild hypertonic type of treatment, with a consequent shrinkage of cells swollen by the action of bacterial toxins, and the clearing of the lymph channels previously described in connexion with hypertonic sodium sulphate. I therefore suggest that, far from causing stasis of the lymph, the closed-plaster method must have the opposite effect and promote a steady flow of lymph from the tissues similar to that promoted by the use of hypertonic sodium sulphate.

Wherein, then, lies the virtue of immobilization of an injured part, whether by plaster or otherwise? Here I suggest that we have tended to confuse flow of lymph with spread of live bacteria, and to regard the two as necessarily concomitant. As you justly point out in your leader, muscular movement and manipulation tend to damage already weakened lymphatic capillaries, and so spread infection. But in the absence of such movement the bacteria probably remain caught up locally in and among the tissue cells, and the steady flow of lymph into and out of the tissues is wholly beneficial. Hence any line of treatment which promotes the latter without causing the former is all to the good; and the advantages of the closed-plaster treatment of a whole limb, and of hypertonic sodium sulphate treatment directed to a wound, are explained.—I am, etc.,

J. C. LYTH.

York, Jan 2.

Human Fertility

SIR,—Dr. John Pryde's contribution to the study of human fertility (January 4, p. 12) is of such general interest and importance that it must produce controversy, in spite of his wishes. Two practical points are concerned. First, if pregnancy is desired coitus should occur during the fertile period—namely, between the tenth and fifteenth days of the menstrual cycle. Secondly, if pregnancy is not desired can we with any degree of certainty advise our patients that it will not take place so long as they abstain from intercourse during this portion of the menstrual cycle—in other words, is abstinence during this time a certain contraceptive? Dr. Pryde's cases support his idea, but the following, the authenticity of which I can guarantee, do not.

Case 1.—Cycle regular 5/28; husband away for three months, returning on the twenty-sixth day of the cycle. Coitus took place that night; no period occurred two days later and pregnancy resulted. Friedman test positive three weeks later. In this case both parties were doctors and realized the importance of the information given.

Case 2.—Cycle 3-4/28-30. Married on sixth day of cycle, following a normal period. No coitus before marriage, husband called up to join the Army two days later. Pregnancy resulted.

These cases are not quoted to belittle Dr Pryde's excellent article in any way, but further to stimulate investigation on this important problem in the manner suggested by him. As a result of such an investigation, carried out on a large number of cases, much valuable information may be obtained, among which may be found that many women from the ovulation point of view, behave like rabbits.—I am, etc.,

Oxford, Jan. 6. J. D. FLEW

Talipes Cavus

SIR,—Mr. W. Kent Hughes's article on talipes cavus (December 28, p. 902) was very interesting. I spent some time trying to understand his explanation of the clawing of toes in acquired pes cavus, but failed. He states that "clawing of the toes is attributed by some authors to paralysis of the interossei," and gives numerous points against this theory. Most authorities that I have heard on the subject believe that pes cavus may be due to paralysis or paresis of the lumbricales (not interossei). This explanation appeals to me as reasonable for two main reasons.

First, the deformity of the hand following an ulnar palsy is typical—the ring and little fingers are clawed whereas the index and middle fingers are not. Since the ulnar nerve supplies all the interossei, if Mr. Hughes's views were correct one would expect clawing of all the fingers. The lumbricales to the ring and little fingers are paralysed in an ulnar palsy and the corresponding fingers are clawed. *I think the condition in the foot is analogous.* Secondly, the operative procedure based upon the theory that clawing of the toes is due to paresis of the lumbricales has been used successfully on many cases at the Wingfield Hospital, Oxford. The operative *procedure is essentially a reconstruction* of the lumbricales by suturing the long flexor to the long extensor of the toes. The flexor is usually brought up along the medial side of the proximal phalanx and sutured to the extensor expansion over the distal end of the proximal phalanx. As soon as the suturing is finished the clawed toe should be perfectly straight.—I am, etc.,

Luton, Dec. 30. L. W. PLEWES.

Indian Medical Department

SIR,—With reference to the correspondence on the above subject may I exercise the privilege of disagreeing with a portion of the editorial note (December 14, p. 850). Your closing sentence is misleading. An Indian military hospital is for Indian troops, while a British military hospital is for British troops. Both, of course, are Indian in the sense that they are for use in India or elsewhere under the C.-in-C., India. The personnel of both or either may be British or Indian (vide the case of the Bengalee in the R.A.M.C. and of the Europeans in the I.M.S.). The test of the correct designation of the military hospitals in India would be to address a letter to the "Indian Military Hospital" in Barrackpore, for instance, and it would *not* be delivered at the British Military Hospital.

The matter of the qualifications of the military assistant surgeon class in the I.M.D. and their registration on the British *Register* is one that calls for some "searching of the heart" on the part of the General Medical Council. All these medical gentlemen undergo a full curriculum in recognized Indian universities but are debarred from British registration. Last week it was announced that the Government were giving sympathetic consideration to the registration of ex-enemy aliens, while other aliens were already admissible to the *Register*. What about these British practitioners in the I.M.D.? While not wishing to name any prominent medical men now in Britain, I would state that there are quite a number who have "pitched their tents" in the British Isles, and on the strength of their studies in India have obtained degrees and diplomas ranging from Oxford to any one of the corporations one cares to name. Might I ask that retired officers of the I.M.D. be allowed registration (for the duration), so that their wide experience in medicine and army administration may be used at the present time. Some of them could usefully do A.R.P. or locumtenent work for men on Service, and at the conclusion of hostilities they would not remain in competition with the returned Service officers, especially as they already enjoy Army pensions. A gesture of this nature calls for moral courage, and I do not think the Briton of 1940 lacks this prerequisite.—I am, etc.,

St. Helens, Dec. 16. DONALD CAMPBELL.

SIR,—*With reference to Sir Henry Gidney's letter about the* Indian Medical Department and your comments on the phrase "Indian Military Hospitals" (December 14, p. 850), I feel that this phrase is apt to be very misleading, as it has apparently been so with you. I shall be glad if you will allow me to clear up this definition in your columns.

The military hospitals in India are divided into two separate groups. One deals with British troops only, and the hospitals are termed the "British Military Hospitals," to which the Assistant Surgeon Branch of the I.M.D. is attached for duty. The other group deals with Indian troops only, and *the hospitals are termed the "Indian Military Hospitals,"* to which the Sub-Assistant-Surgeon Branch of the I.M.D. is attached. This branch is recruited from Indians only, who are given a medical school training only, whereas the Assistant Surgeon Branch is recruited from Europeans and Anglo-*Indians who have a university training.*—*I am, etc.,*

Maltby, Dec. 19. A. H. BARTLEY.

Universities and Colleges

UNIVERSITY OF OXFORD

B.M. and B.Ch. Examinations, 1941

The first examination for the degrees of B.M. and B.Ch. will be held on March 17, 19, 20, 21, 22, 24, and 25, and the second examination on March 31 and April 2, 3, and 4. Entries should reach the University Registry by 3 p.m. on February 22.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Lectures

The course of Hunterian Lectures for 1941 is arranged as follows: January 13, Prof. H. A. Harris, Growth in general; January 14, Prof. Harris, The anatomy and physiology of locomotion and posture; January 15, Prof. Harris, The inherent weakness of the human body with reference to orthopaedic practice; January 20, Mr. L. E. C. Norbury, Carcinoma of the rectum, with special reference to its pathology and treatment, based on a survey of cases at St. Mark's Hospital during the past ten years; January 22, Mr. Norman Capener, The lumbo-sacral joint: a discussion upon spondylolisthesis, scoliosis, and sciatica; January 24, Mr. R. E. Smith, The undescended testicle; January 27, Mr. H. A. Brittain, The principles of arthrodesis; January 29, Mr. J. M. Yoffey, The flow of lymph from the nasopharynx and the absorption of dyes, proteins, viruses, and bacteria after nasal instillation; January 31, Mr. W. H. Graham Jessop, The surgery of the great omentum; February 3, Mr. F. Ronald Edwards, Dried plasma: its preparation and administration for the syndrome of shock; February 10, Mr. F. F. Rundle, A study of the pathogenesis of thyrotoxicosis. On February 17 Dr. A. J. E. Cave will give the Arris and Gale Lectures on the comparative anatomy and evolution of the paranasal sinuses. All the above lectures begin at 3 p.m.

Prof. A. H. Burgess will deliver the Hunterian Oration on Thursday, February 13, at 2.30 p.m.

St. Thomas's Hospital Gazette has recently celebrated its Jubilee with the special issue for December, 1940. In spite of the war it still maintains the high standard of medical journalism it has always set before it, and the Jubilee number reproduces two photographs of the King and the Queen inspecting damage done to St. Thomas's Hospital during air raids on London.

Obituary

F. G. PROUDFOOT, M.D.

Consulting Obstetric Physician, Radcliffe Infirmary, Oxford

Dr. Frank Grégoire Proudfoot, who died on December 19, 1940, was born at St. Andrews on May 7, 1869, and was educated at Dumfries Academy and Madras College, St. Andrews, and at Edinburgh. He took his degree in Arts at St. Andrews in 1890 and graduated M.B., C.M. at Edinburgh in 1894, taking his M.D. of the latter university in 1910. After qualifying he was house-surgeon at the Royal Infirmary, Edinburgh, and later house-surgeon and house-physician at the Radcliffe Infirmary, Oxford, where he settled in private practice. Dr. Proudfoot was fortunate in his choice of Oxford at that particular period. The modern medical school was just beginning to make headway, having been stirred by the activity of Sir Henry Acland, and among Dr. Proudfoot's colleagues were Arthur Thomson and James Ritchie, both graduates of Edinburgh University. Dr. Proudfoot quickly established an extensive practice, and in due course became one of the best-known practitioners in Oxford and district. He early specialized in midwifery, and in 1920 had the satisfaction of witnessing the foundation of the Maternity Department of the Radcliffe Infirmary as a special unit. It is said that he paid the salary of the early house-physicians out of his own pocket. For many years he acted as honorary physician to the Maternity Department, and on his retirement was elected consulting physician there. Besides being consulting obstetrician to various local authorities, he was also examiner to the Central Midwives Board and to St. Andrews University in materia medica. In 1920 Dr. Proudfoot received the degree of M.A. (Oxon.), being the last of the Fellow commoners of Queen's College. In 1929 he was appointed honorary surgeon to H.M. King George V.

A keen officer of The Queen's Own Oxfordshire Hussars, Proudfoot served abroad during the war of 1914–18 as Major R.A.M.C. attached to this regiment. After being wounded in the second battle of Ypres he became O.C. 3rd Southern General Hospital and, later, A.D.M.S., 48th Division T.A., with the rank of colonel. At the outbreak of the present war he was chosen as the physician on the medical board for examining university and other candidates for commissions, and all who worked with him will testify to the happiness and good humour that pervaded the board. He had only recently taken on the presidency of No. 2 board in Oxford when it became obvious to his friends that he would not be spared to carry on.

In private life he was a most gracious host and a delightful companion. He was a fine judge of wine, and was perhaps at his best in the Common Room of his college after dinner. For many years he was a member of the Royal and Ancient Club of St. Andrews, and in his early days was a scratch golfer. Until only a short time before his death he would enjoy his round at Frilford Heath, where he had been captain. Dr. Proudfoot was a keen follower of university sports and was medical officer to the Oxford University Association Football Club and the Oxford University Boxing Club, as well as medical officer to the Oxford City Association Football Club. A lifelong Mason, he had the distinction of being a grand lodge officer and a past-master of the Churchill and Apollo Lodges. At the time of his death he was the Grand Superintendent of the Provincial Grand Chapter of Oxfordshire. When the British Medical Association met at Oxford in 1904 he was secretary of the Section of Obstetrics and Gynaecology, and at the meeting in 1936 he was vice-president of that section. Dr. Proudfoot leaves a widow and one son, who is serving as Lieut.-Commander in the Royal Navy. Those who have had the privilege of his friendship will miss his cheerful and breezy personality, which covered many acts of unadvertised kindness. His was a life well spent in the service of his profession and the State.

We record with regret the death of Dr. OWEN FOULKES EVANS, one of Liverpool's most well-known general practitioners. Dr. Evans qualified M.B., C.M. at Edinburgh in 1890 and took his M.D. of that University in 1894. Almost immediately after qualifying he began practice in Liverpool, where he was to remain for all his active medical life until failing health obliged him, very unwillingly, to retire in 1936. Keenly interested in the clinical rather than the scientific side of medicine, Evans soon gained a reputation as a good diagnostician. His examinations were always very thorough, and he did not hesitate to call in a specialist if in doubt. His patients were his absorbing interest; nothing he did for them was too much trouble. He was never in a hurry and never too busy to sympathize with them in their sorrows. His large practice allowed him little time for public or social work, but during his summer holidays he showed another side of his character in his complete enjoyment of a change of interests, of scenery, and of the many and varied entertainments which go to the making of a successful holiday. It was during these holidays that his deputies came into contact with his patients and realized their confidence in and affection for their "beloved physician." He had been a member of the British Medical Association for forty-five years.

Dr. ALGERNON DUTTON BRENCHLEY, who died at Bournemouth on December 5 at the age of 86, received his medical education at the University of Aberdeen and at Guy's Hospital, qualifying M.R.C.S., L.S.A. in 1875. He took the M.B., C.M. of Aberdeen in 1877 and three years later the M.D. of that university. He became a member of the Society of Apothecaries in 1876 and was Master of the Society in 1924–5. He was Senior Past Master and Father of the Court of Assistants at the time of his death. Dr. Brenchley had practised for many years at Denmark Hill, London.

We regret to record the death, at the age of 73, of Mr. THOMAS CAMPBELL GREY at Hexham on December 17. He was educated at the Bristol Medical School, receiving in 1889 the Committee Gold Medal of the Bristol General Hospital, and at the London Hospital. He took the Lady Haberfield Entrance Scholarship and the Martyn Memorial Scholarship in Pathology and was also a prizeman in medicine, midwifery, pathology, and anatomy. He qualified M.R.C.S., L.R.C.P. in 1890 and two years later took the F.R.C.S. He was assistant physician at the Bristol General Hospital and prosector and assistant demonstrator in anatomy and physiology at the Bristol Medical School. He then held the post of resident medical officer at Swansea Hospital and later went into practice at Weston-super-Mare, to which town he returned after a short period at St. Neots. He later moved to Camborne, being honorary medical officer to the local hospital and honorary surgeon to the Miners' Hospital, Redruth. He had been a member of the British Medical Association for thirty-six years and in 1903–4 was honorary secretary of the old Truro Division. In 1904 he moved to Corbridge-on-Tyne and three years later went to Basingstoke, where he was honorary medical officer to the cottage hospital, then to Wrexham in 1908, only to return to Hampshire, this time to Fordingbridge. In 1911 he moved to Cheltenham and then back to Corbridge-on-Tyne in 1915, and to Newcastle-upon-Tyne in 1921 until 1926, when he retired to Hexham.

We regret to announce the death, on December 24, of Dr. HELEN YOUNG CAMPBELL at St. Andrews. Dr. Campbell was the daughter of the late Mr. W. Y. Campbell of Durban, and took the Scottish triple qualification in 1907. She was for a time in practice in South Africa, where she wrote *Practical Motherhood* for mothers who lived in the remote

backveldt. On her return to England she worked at the Infants Hospital, Westminster, on problems of infant nutrition, and in 1911 was appointed medical officer to the Babies' Welcomes, which the Bradford Health Committee had recently taken over. She exhibited the intense and eager pioneer spirit and fearless courage needed to build from humble beginnings what became an outstanding piece of preventive medicine—the City of Bradford Infants' Department. Dr. Campbell worked untiringly at her conception of a clinic-hospital run by the city for the city, where the city's infants could be given a healthy start in life. She saw a scheme where that much-neglected group, the pre-school children, could be included and supervised up to their reaching school age. She would spend weeks of time studying and restudying the figures in her annual reports to see what fresh light they might throw on the problem of infant life and mortality. At various times she was offered work which would have given her wider scope in teaching, but all these she refused, saying that her work in Bradford was not yet completed. Her reward was the remarkable improvement in the health and physique of the children of Bradford and the reduction of the infant mortality rate. The continuation of the supervision of children until reaching school age, a development of maternity and child welfare work which she had much at heart, was not achieved in Bradford in her time. Her health did not stand the demands she made on it, time did not bring about the hoped-for improvement, and ultimately she resigned. She spent her retirement studying in the library of St. Andrews and writing, until latterly pain and infirmity kept her to her room.

We regret to announce the death of Dr. GODFREY CARTER formerly senior surgeon to the Sheffield City Police. Godfrey Carter qualified M.R.C.S. in 1880 and L.R.C.P.Ed. in 1884. In 1894 he took the M.R.C.P.Ed., and two years later the M.B., Ch.B.Vict. and the D.P.H.Lond. He was senior assistant house-surgeon at the Leeds General Infirmary, and demonstrator in anatomy and internal examiner in forensic medicine at Sheffield University. He was an external examiner in forensic medicine in the Universities of Leeds, Edinburgh, and Birmingham. Dr. Carter was for about twenty-five years in general practice in Sheffield. In 1923 he was president of the Medico-Chirurgical Society. For several years he held the post of surgeon to the Sheffield Police, and as such had a wide practical experience of forensic medicine, on which subject he was lecturer in the University. He was much interested in the detection of alcoholism by urinary analysis, a subject on which he published, in collaboration with Mr. Southgate, an article in this *Journal* in 1926. After leaving Sheffield he went to live in Somerset, where his forensic experience soon obtained for him the post of pathologist to the Taunton General Infirmary, and much medico-legal work over a wide district of the South-Western Counties. He was a vice-president of the Medico-Legal Society, and had been a member of the British Medical Association for fifty-three years.

We regret to announce the death on October 28 in his sixty-third year of Dr. JOHN BENJAMIN VALENTINE WATTS at Barberton, Transvaal. Dr. Watts was born at Durban, was educated at Maritzburg College, and studied medicine at Bristol, graduating M.B., B.S. of the University of London in 1906. He held the posts of casualty officer and junior house-surgeon at the Bristol Royal Infirmary, house-surgeon at Bristol General Hospital, and resident medical officer at Newport, Mon., Hospital, before, in May, 1907, he settled in practice in Barberton, Transvaal, where he gained a reputation as a surgeon. In 1925 he retired from practice for five years and then restarted practice in Cambridge, East London, retiring again early in 1939. He was a member of the British Medical Association and was chairman of the East London Division in 1935–6.

All those interested in international hygiene will learn with regret of the death in Paris on October 7 of CAMILLE BARRÈRE, Ambassador of France, Member of the Institute, and delegate for France on the Permanent Committee of the International Office of Public Health. It was to Barrère's inspiration and active support while Ambassador at Rome that the convention founding the International Office of Public Health was drawn up in 1907. He had been led early in his diplomatic career to take an interest in international hygiene, and had presided at four international conferences concerned with the Danube, Egypt, and the Suez Canal. He realized the importance, little recognized then but widely accepted now, of protecting commercial interests and preventing the spread of epidemics by a rational and uniform system of quarantine control throughout the world. Barrère represented France on the Permanent Committee of the Paris Office from its inception, and though he was often pressed to assume the presidency, his modesty always prevented him from doing so. He never intervened in technical discussions, but his advice and support were invaluable on questions concerning the organization and diplomatic status of the Office. In spite of advanced age and failing health he lost none of his interest in the work of the Office, nor any of his charm and courtesy to even the most junior delegate. To have known him was to realize why, of all French titles, that of "Ambassadeur de France" commanded the highest respect, and it could be wished that he had been spared seeing the end—as he saw the beginning—of the Third Republic.

The following well-known foreign medical men have died: LOUIS SPILLMANN, dean of the medical faculty of Nancy, aged 64; Dr. POUSSON, honorary professor of the Bordeaux medical faculty, aged 87; Dr. ROCAZ, honorary physician to the children's hospital at Bordeaux; Dr. GLENN E. CULLEN, professor of biochemistry in the University of Cincinnati; Dr. A. MCGLANNAN, emeritus professor of surgery at the University of Maryland School of Medicine, aged 67; Dr. HENRY CLARKE COE, emeritus professor of gynaecology at the New York University College of Medicine, aged 84; Prof. ABEL FILHO of Rio de Janeiro; Dr. PAUL PINTO ESCALIER of Buenos Aires; Dr. E. P. FIDANZA, professor of dermatology at Rosario, Argentina; Dr. ERNEST A. PRIBRAM, formerly professor of pathology in Vienna University, aged 61; Dr. ALEXANDER SWANSON BEGG, dean and Waterhouse professor of anatomy at the Boston University School of Medicine, aged 59; Dr. MAX ASCHNAZY, professor of morbid anatomy at Geneva; Dr. HECTOR CHRISTIAN, formerly professor of hygiene and bacteriology at the University of Geneva, aged 78; Dr. FRANCIS PARK LEWIS, co-editor of the *American Journal of Ophthalmology*, aged 85; Dr. CHARLES NICOLL BANCKER CAMAC, emeritus professor of internal medicine at the New York Polyclinic medical school and hospital, aged 72; and Dr. ARTHUR CARADOC MORGAN, associate editor of the *Pennsylvanian Medical Journal*, aged 70.

The Services

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Temporary Surgeon Lieut.-Commander JOHN BARCLAY BARR, R.N.V.R., whose death through enemy action is announced, was a graduate of the University of Glasgow, where he took the degrees of M.B., Ch.B. in March, 1936. For over two and a half years he was house-surgeon at the Western Infirmary, David Elder and Southern General Hospitals, Glasgow. He went on a voyage round the world as a ship surgeon, and his arrival at Port Said on the homeward trip coincided with the outbreak of war. He immediately returned home, and within a month of his arrival was appointed to one of His Majesty's ships. A native of Blantyre, he was educated at St. John's Grammar School, Hamilton, and at Biggar High School. He was a King's Scout. He joined the British Medical Association in 1936.

ROYAL ARMY MEDICAL CORPS

Lieut.-Colonel WILLIAM ARTHUR ROSEBERY SPONG died suddenly on December 22, 1940, at the age of 57, after a very short illness. He was born on April 11, 1883, and graduated M.B., Ch.B. at Trinity College, Dublin, in 1907. In the same year he entered the R.A.M.C. as lieutenant, being promoted major in 1919, lieutenant-colonel in 1931, and retiring in 1935. He did a long term of duty in India. During the war of 1914–18 he was for a time employed on embarkation and distribution duties in Karachi, and for his services was mentioned in dispatches. He was an Associate of the Order of the Hospital of St. John of Jerusalem in England. After retiring he settled in practice in Sutton Benger, Chippenham, and on the outbreak of the present war was appointed officer commanding a military hospital. He joined the British Medical Association

in 1910. Lieut.-Colonel R. H. L. writes: The many friends of W. A. Spong will hear with deep regret of his sudden death. He had spent many years of his Army service in India, and when he retired from active service a few years ago he settled in a busy country practice in Wiltshire, returning to serve on the outbreak of war. He was always a hard worker, never sparing himself either in doing his job or in looking after the welfare and comfort of those under his care, whether patients or personnel. He was generous to a fault, and it was his delight to know the Christian names of each child in his practice, chatting with them all in easy fashion, whether they came from the labourer's cottage or the mansion. A keen shot and angler both at home and abroad, he was happiest when he was able to snatch a few hours' respite to visit the banks of some river, full of anticipation, and, more often than not, reluctantly coming away with very satisfactory results. Our heartfelt sympathy goes out to his widow and children in their great bereavement

Lieut DAN BRADBURY died recently at his parents' home in Sheffield from shock when attempting to repair an electric light fault. He was educated at the University of Sheffield and graduated M.B., Ch.B. in 1939. He joined the British Medical Association in the same year.

Lieut. LOUIS HENDERSON MACDONALD is posted as "Died" in an Army casualty list published on January 6. He graduated M.B., Ch.B. at Birmingham University in 1924, and took the M.R.C.S., L.R.C.P. in the same year. He had been assistant medical officer to the venereal diseases department and house-surgeon and house-physician at the General Hospital, Birmingham, and assistant pathologist and bacteriologist at the Dudley Road Hospital, Birmingham. At the outbreak of war he was in practice at Southampton.

The name of Lieut. JAMES PATTINSON THYNE is included as "Killed" in an Army casualty list published on December 28. He received his medical education at King's College Hospital, and qualified M.R.C.S., L.R.C.P. in 1928. He had held the post of house-surgeon at the hospital, and before the outbreak of war was in practice at Wandsworth.

DEATHS IN THE SERVICES

Surgeon Rear-Admiral FREDERICK JOHN LILLY, R.N. (ret.), died suddenly at Hove on December 12, aged 82. He received his medical education at St. George's Hospital, and took the M.R.C.S. in 1882 and the L.R.C.P.Ed. in 1883. Entering the Royal Navy soon afterwards, he was promoted to fleet surgeon in 1900, became deputy surgeon general in 1907, and retired as surgeon general in 1912, this title being subsequently altered to surgeon rear-admiral. He had seen a lot of active service in various expeditions: in East Africa in 1892–3, when he was mentioned in dispatches and received the Africa General Service medal with a clasp; in the South African War of 1899–1902, as staff surgeon of H.M.S. *Forte*, he landed and served in the Naval Brigade in the relief of Ladysmith, and was present at the actions of Colenso, Spion Kop, Vaalkranz, Pieters Hill, and Elandslaagte, was mentioned in dispatches, and received the Queen's medal with two clasps; and as fleet surgeon of H.M.S. *Doris*, flagship, he served in the Gambia punitive expedition of 1901 and was mentioned in dispatches. He had been a member of the British Medical Association since 1884.

Colonel ALBERT GEORGE THOMPSON, C.M.G., D.S.O., late R.A.M.C., died at Redruth on December 11, aged 73. He was born at Islington on May 24, 1867, and was educated at the University of Edinburgh, where he graduated M.B., C.M. in 1891, also taking the D.P.H. of the Scottish Colleges in 1905. Entering the Army as surgeon lieutenant in 1892, he became lieutenant-colonel in 1915, received a brevet colonelcy in 1918, and retired in 1919. He served in the South African War in 1902 in the Orange River Colony, and received the Queen's medal with two clasps, and in the war of 1914–18, when he was five times mentioned in dispatches. He received the D.S.O. in 1917 and the C.M.G. in 1918. He also received the Médaille de la Reconnaissance Française. He had been a member of the British Medical Association for twenty-seven years.

Colonel SYDNEY GEORGE BUTLER, D.S.O., late R.A.M.C., died at Hove on December 29, 1940, aged 66. He was born on May 18, 1874, received his medical education at the London Hospital, and took the M.R.C.S., L.R.C.P. in 1897. After filling the post of house-surgeon at the Poplar Hospital he entered the R.A.M.C. as lieutenant in 1899, became lieutenant-colonel in 1915, and retired with the rank of colonel in 1920. He served in the South African War of 1899–1902, when he took part in the relief of Ladysmith, including the actions at Colenso, Spion Kop, Vaalkranz, Tugela Heights, and Pieters Hill, also in the operations in the Transvaal and in Cape Colony, and received the Queen's medal with five clasps and the King's medal with two clasps. He also served throughout the war of 1914–18, when he was twice mentioned in dispatches in 1914, in which year he received the D.S.O. From June, 1919, to January 1920, he was consulting surgeon to the British troops in France and Flanders, and in 1920–1 was consulting surgeon to the British Army on the Rhine. After retiring he served for a time as surgeon in the P. & O. Company. He had been a member of the British Medical Association for thirty-three years.

Colonel WILLIAM LECKIE WEBSTER, M.C., late R.A.M.C., died in London on December 1, aged 53. He was born on November 3, 1887, and was educated at the University of Edinburgh, where he graduated M.B., Ch.B. in 1910. He entered the R.A.M.C., from the Special Reserve, as lieutenant in 1911, received a brevet majority in 1919, and became full colonel in 1937. He had just been placed on retired pay on account of ill-health. He served in the war of 1914–18, was twice mentioned in dispatches in 1918, and received the M.C. as well as the medals. He leaves a widow. He had been a member of the British Medical Association for twenty years.

Medical News

In a statement made early this week Sir Wilson Jameson, Chief Medical Officer of the Ministry of Health, said that in the crowded deep shelters there were at present only stray cases of infectious diseases. He gave the following figures for the principal infectious diseases notified in 1938, 1939, and 1940 down to December 14: *Scarlet fever*: 1938, just over 99,000; 1939, just over 76,000; 1940, nearly 63,000. *Diphtheria*: 1938, 65,000; 1939, 46,700; 1940, just over 44,000. *Pneumonia*: 1938, 45,000; 1939, 42,000; 1940, nearly 46,000. *Dysentery*: 1938, 4,170; 1939, 963; 1940, 2,900. *Enteric fever*: 1938, 1,300; 1939, 1,500; 1940, 2,800. *Cerebrospinal fever*: 1938, 1,288; 1939, 1,500; 1940, approximately 12,500.

A meeting of the Pharmaceutical Society of Great Britain will be held at 17, Bloomsbury Square, W.C., on Thursday, January 16, at 2.30 p.m., when Mr. A. Mortimer will give an address on "Drug Supplies in Wartime."

The *Journal of the American Medical Association* announces that forty-eight physicians have formed a medical and surgical supply committee, with offices at 420, Lexington Avenue, New York, and undertaken a nation-wide campaign for surgical and medical supplies to equip 500 first-aid stations and field hospitals to help in caring for the British war wounded.

Dr. Charles Armstrong, senior surgeon of the United States Public Health Service, National Institute of Health, Washington, D.C., delivered the first Harvey Society Lecture of the current series at the New York Academy of Medicine on October 3, his subject being "Studies on Lymphocytic Choriomeningitis and Poliomyelitis."

Some members of the Pharmaceutical Society serving in the R.A.M.C. are at present in Iceland. They are faced with long winter nights when almost the only form of recreation is reading. Gifts of books—technical and fiction—would be very welcome and should be dispatched to Sergt. C. W. Vokins, R.A.M.C., Sergeants' Mess, 487 Field Ambulance, c/o Army Post Office 500.

The name of Dr. Donald Shrewsbury Todd-White has been brought to notice for brave conduct in connexion with civil defence.

The British Government has received a loan from Dr. J. V. Landor, physician and registrar of the General Hospital, Singapore, of £1,000 free of interest for the prosecution of the war.

An institute for endocrinology has been founded at São Paulo, Brazil, consisting of three departments devoted respectively to experimental endocrinology, human endocrinology, and a laboratory for testing opotherapeutic products.

Dr. Otto Loewi, for many years director of the faculty of pharmacology at Graz University, has been appointed research professor of pharmacology at New York University.

Medical Notes in Parliament

Protection of Practices in Bombed Areas

Mr. GROVES asked Mr. MacDonald on December 19 to consider formulating a scheme for the protection of panel practices of medical practitioners who had been injured or whose houses had been so damaged by enemy action that they were unable to continue for a time in practice. Mr. MACDONALD said he understood that insurance medical practitioners who suffered hardships by reason of air raids received every possible assistance from the Insurance Committees and their professional colleagues. Where his approval would be necessary to an extension of the Protection of Practices Scheme in operation in any area to cover practices in temporary abeyance as the result of air raids, he would be prepared to consider the matter on application from the Insurance Committee.

Notes in Brief

The recommendation of the Dental Benefit Council that there should be an increase in the scale of fees for the dental treatment of insured persons was rejected by the National Health Insurance Joint Committee on the ground that justification had not been shown for such an increase at the present time.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

In England and Wales in the first week of December there were increases only in the incidence of pneumonia and whooping-cough as compared with the previous week. The fall in the incidence of measles, although probably only temporary, is gratifying. As regards the probability of an epidemic of influenza, factors difficult to assess with accuracy, such as the environment and nutrition of the population at risk, are probably more important than hypothetical alterations in the virulence or dispersal rate of the causative agent or supposed changes in the "epidemic constitution." The time is opportune for a controlled trial of the available antigens in influenza prophylaxis, but at present there are difficulties in the way of applying it on a scale sufficient to yield reliable results.

Registrar-General's Annual Report for Northern Ireland

There was a decrease of 502 births in 1939 compared with the previous year, the rate of 19.5 per 1,000 of the estimated population being 0.5 per 1,000 lower than in 1938. The rate for the aggregate of urban areas exceeded that for the rural areas, Londonderry C.B. showing the highest and Co. Fermanagh the lowest. Illegitimate births were 4.7 % of the total births registered, and were slightly in excess of the previous year. The death rate was 13.5 per 1,000, or 0.2 below the rate for 1938; with the exceptions of 1930 and 1934 this was the lowest rate recorded in the present century. In each successive quarter of the year equivalent death rates were: 16.5, 13.5, 11.4, and 12.8. The death rate for the aggregate of urban areas was lower than that for rural areas. Belfast C.B. recording the lowest and the counties of Londonderry and Tyrone, jointly, the highest. There were 1,779 deaths among infants under 1 year, or 70 per 1,000 births registered, compared with 75 in the previous year. In 1939 and 1938 the infant mortality rates for England and Wales were 50 and 53, for Scotland 68 and 70, and for Eire 66 and 67, respectively. The rates recorded in urban areas are generally considerably in excess of those in rural areas. The infant mortality rate among illegitimate children was 131, compared with 149 in the previous year; for legitimate children the rate was 68 and 72 per 1,000 respectively. Deaths from the principal epidemic diseases, except influenza and diarrhoeal diseases of children under 2 years of age, were fewer than in 1938. The decrease in the mortality from measles is marked, but only slight in respect of enteric fever, scarlet fever, whooping-cough, diphtheria, and dysentery.

No. 49

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended December 7, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1940					1939 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebro-spinal fever	144	3	35	6	5	27	4	6	1	2
Deaths		3	5				1	—		
Diphtheria	1,424	64	542	34	34	994	22	227	46	34
Deaths	35	—	11	—	1	26	3	11	3	1
Dysentery	92	2	50	—	—	50	3	25	—	—
Deaths			1	—	—			—	—	—
Encephalitis lethargica, acute	1	—	1	—	—	2	—	1	—	—
Deaths		2	—				—	1		
Enteric (typhoid and paratyphoid) fever	23	1	5	9	1	29	1	5	10	1
Deaths	—	—	—	—	—	1	—	—	—	—
Erysipelas		24	61	6	3			55	12	7
Deaths		—	1				—	—		
Infective enteritis or diarrhoea under 2 years										
Deaths	41	1	9	6	3	29	3	7	7	2
Measles	14,147	325	3372		9	2,225	20	11	1	47
Deaths	12	1	2	3	—	—	—	—	2	—
Ophthalmia neonatorum	80	—	9		—	96	9	24		—
Deaths										
Pneumonia, influenzal*	782	37	12	—	10	449	15	12	1	5
Deaths (from influenza)	42	8	3	1	—	23	3	—	—	2
Pneumonia, primary			205	12				145	17	
Deaths†		50		17	8		9		8	6
Polio-encephalitis, acute	2	—				2	—			
Deaths		—					—			
Poliomyelitis, acute	18	—	2	—	—	4	1	—	—	—
Deaths		—	—				1	—		
Puerperal fever	2	2	17	2	—	2	2	11	2	1
Deaths		1§					1§			
Puerperal pyrexia	109	3	22		—	128	4	16		—
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,597	69	231	62	55	1,233	37	179	45	102
Deaths	1	—	—	—	—	2	—	—	—	—
Small-pox	—	—	—	—	—	—	—	—		—
Deaths		—	—	—	—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—					—	—	—
Whooping-cough	2,421	17	2262		23	1,183	19	27		4
Deaths	13	9	2	—	1	2	—	—	—	1
Deaths (0-1 year)	340	22	73	35	17	250	42	49	34	8
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	5,979	903	646	205	132	4,584	712	657	179	134
Annual death rate (per 1,000 persons living)			13.1	13.7	11.6			13.3	12.0	11.8
Live births	4,484	334	742	322	174	4,764	627	797	251	237
Annual rate per 1,000 persons living			15.0	21.5	15.2			16.1	16.9	20.8
Stillbirths	159	7	26			256	28	37		
Rate per 1,000 total births (including stillborn)			34					44		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† Since January 1, 1940, figures for London (b) have been for deaths from all forms of pneumonia; the corresponding figures for 1939 relate to deaths from lobar pneumonia only.

‡ Notification in certain administrative areas only.

§ Death from puerperal sepsis.

Letters, Notes, and Answers

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QUERIES AND ANSWERS

Dysmenorrhoea

Dr. J. E. O'LOGHLEN (Clapham Common) writes: "Country Practitioner" (December 28, p. 924) does not give sufficient details to make an exact diagnosis. Assuming that the gynaecological findings are negative, further interference in the way of examination or any kind of operation is not only contraindicated but might even be harmful; so also would be the application of antispasmodics such as belladonna, papaverin, codeine, etc. Endocrine therapy should only be prescribed when the diagnosis is confirmed. A good plan is to do a tolerance test of adrenaline, cocaine, and belladonna. This I was accustomed to do many years ago when working with Adler in Vienna. Might I also warn against the unnecessary dilatation and curetting operation? Adler did 1,400 in cases where the gynaecological findings were negative; less than 1% were relieved. Novak considers that more than 90% of cases are psychological. Oskar Frankl, with whom I was privileged to work, was of the same opinion, and would never agree with mechanical dysmenorrhoea, as is instanced by the large numbers of perfectly healthy women who have retroversions or anteflexions without discomfort until the condition is discovered accidentally. The age of the patient at the first menstruation, and its time, character, and duration, are of the utmost importance. Was it preceded by proper instruction in sex hygiene, or did haemorrhage appear suddenly, as in haemoptysis? Try and get a full family history, as well as details of occupation, hobbies, sports, and social contacts. Dysmenorrhoea may sometimes be allergic. Several cases have been described in America by Dudley Smith. Fifteen years ago I treated more than 600 cases of dysmenorrhoea by diathermy with excellent results. I thought then that the relief from pain was due to the diathermy, but have now come to the conclusion that it was mostly suggestion. Many of these cases are relieved by painting the inside of the nose both sides with a 5% solution of cocaine. The patient will of course not know what your magic drops are.

Dr. DUNCAN BALLANTINE (Rotherham) writes: May I suggest to "Country Practitioner" that he try the effect of benzedrine on his patient with dysmenorrhoea. I have now seen several patients who have been amazingly improved by this means, and certainly the price is far from exorbitant. The drug is said to be an antispasmodic to uterine muscle, and in addition gives the patient a marked feeling of well-being, in contrast to the usual depression. The dose suggested by the makers is two 5-mg. tablets taken immediately the symptoms arise, and if necessary repeated in four hours. It is as well to remember not to take the drug in the evening in case of insomnia, and it would be safer to test the patient's reaction by giving a smaller dose at some other time, as there are some people who have unpleasant effects following benzedrine.

A Case of Partial Impotence

"Q.R.S." writes: I wonder if any readers could give me information about a curious condition of semi-impotence which does not appear to fall into any of the more usual categories. For one year the patient has suffered from (*a*) diminished sensitivity to sexual excitement; (*b*) incomplete erections—that is, the corpora cavernosa penis erect strongly but the corpus cavernosum urethrae and glans hardly at all. A famous sexologist to whom the case was referred assured me it was purely functional in origin, but I am unconvinced. Up to a year ago the patient was strongly sexed and erections were complete. Is there any organic condition which would account for the specific distribution of the impotence?

Income Tax

New Partnership—Military Service

"T." purchased a share in a practice as from October, 1939, but did not acquire any book debts. In June, 1940, he joined the R.A.M.C., and pays into the partnership account his Army pay. A locumtenent has been engaged at £650 per annum. "T.'s" share of the partnership assessment for the year to April 5, 1941, is based upon the firm's profits for the year 1939; his cash receipts are of course much less than that amount.

*** It should be borne in mind that the liability is not calculated in such a case as this on cash receipts; "T." is liable for tax on his share of *earnings*, whether they have been paid to him or not. In the early years this does involve some financial hardship, but normally there is no escape from it. In the special circumstances, however, it is quite possible that relief can be obtained under Section 23 of the Finance Act, 1940. That section provides that where the earnings of the actual year fall short of the amount assessed by more than 20%, then the assessment shall be adjusted to the actual basis. We therefore advise "T." to write to the inspector of taxes intimating that a claim will be made under the above-mentioned provision when the necessary information is available. The inspector may properly ask for a payment on account to be made in the New Year if the facts are not ascertainable in the fairly near future.

LETTERS, NOTES, ETC.

Reflections on an Address to Medical Students

Dr. REDMOND ROCHE writes: In a vain wooing of sleep one night in "a safe area," where the enemy planes were making a noise, I was reading with much interest my friend Prof. Ryle's inspiring address to medical students of Cambridge at the customary opening of the session (November 16, p. 657), not, indeed, with the idea—far from it—that it would act as a soporific. As usual on such occasions, familiar to us all, a glowing picture was drawn, and rightly, of the hopes and aims that should animate the student and potential doctor. Just then—2 a.m.—in my doctor-host's house the 'phone sounded and the familiar night call was heard. I have never noticed this incident in the doctor's future, not by any means uncommon, mentioned in these addresses. Another reflection occurred to me on reading that ours "is almost the only scientific career remaining which is not concerned in some way with the destruction of life." Are there not among us, a few they may be, but enough to spoil the assertion—the advocates of euthanasia and the abortionists? And which of us, big or little, can look back and feel that by something he has done, or failed to do, a life has not been sacrificed? These remarks are doubtless hypercriticism. A pleasing set-off is the suggestion—not so usual in these addresses—of the splendid opportunities a student or doctor has, of which he should avail himself, for "developing a social conscience."

Medical Students for Shelters

Dr. E. M. H. HERBERT (London, W.1) writes: Having had an opportunity of observing the work done in some of the shelters and witnessing the activities of voluntary helpers and doctors, I think that unrivalled opportunities exist to give our younger colleagues a chance to study conditions under which the population is living. Why should not our medical schools detail some of their students to help in the posts and shelters? It would give them a wonderful chance to "study medicine in the raw," and also give them an understanding of social conditions. I think this is an ideal ground for learning general practice, besides being a great help to the community.

Gentian Violet in Stomatitis

Dr. RALPH JONES writes: Some time ago I sent a bad case of stomatitis in an adult to hospital, and was advised to try daily swabbing with a 1% solution of gentian violet. I gave this treatment a thorough trial with both children and adults, and found, like C. H. Smith and H. B. Johnson, who are quoted in your annotation (December 14, p. 838), that it never had the slightest effect.

Collodion Treatment of Herpes Zoster

Dr. CRANSTON WALKER (Birmingham) writes with reference to this subject (*Journal*, January 4, p. 38): Before covering the eruption with collodion it is advisable to be sure that secondary infection is not already established. Otherwise the patient is liable to return, or go elsewhere, with a new pain, local tenderness, malaise, and a raised temperature. Relief of these symptoms can be obtained by incising the covering of collodion and letting out the pus. No anaesthetic is required.

Corrigendum

The degrees of M.B., B.S. should have appeared after Lady Ruth Balfour's name in the New Year Honours list (January 4, p. 25).

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY JANUARY 11 1940

DIPHTHERIA IMMUNIZATION

The following is the text of a letter which has been sent by the Secretary of the British Medical Association to medical officers of health of county councils or sanitary authorities in England and Wales:

"A considerable number of medical officers of health have applied to the Association for a copy of the Association's scale for the remuneration of general practitioners undertaking diphtheria immunization. The Association's scale, together with a note of its application to typhoid inoculation, is given below:

(a) The method of immunization to be employed should be determined by the local authority, who should supply the necessary material without charge to the practitioner.

(b) The fee per injection of immunizing material should be not less than 2s. 6d.

(c) The local authority should determine whether anterior and/or posterior Schick tests are to be carried out. Where the services of general practitioners are utilized for this purpose a fee of not less than 5s. per Schick test, including the reading, should be paid.

(d) These fees are inclusive of a report to the local authority. The report should be as simple as possible, providing for the name of the patient, the date of the inoculation(s), the amount and name of the reagent used, the identification number of the reagent, and the result of the immunization.

(e) If immunization is undertaken on a sessional basis remuneration should be not less than 1½ guineas for a session of not more than two hours.

The British Medical Association suggests that the same scale—that is, sections (a), (b), (d), and (e)—should be adopted in regard to inoculation against typhoid where this is being carried out by general practitioners.

The Minister of Health has intimated that, in so far as his approval may be necessary, he is prepared to approve the Association's scale as set out above.

I am sure that medical officers of health generally will appreciate the importance of securing the co-operation of the general practitioners of their area in the performance of this important prophylactic work, even though it may be necessary, at least for the present, to organize this work on a sessional basis. The Minister concurs in this view, and, in order to remove any misunderstanding which may exist, is sending a further communication to this effect to local authorities."

DOSAGE AND PACKING OF A.P.T.

The Chief Medical Officer to the Ministry of Health has sent the following letter to all medical officers of health:

"The difficulty of obtaining large quantities of small glass ampoules has made necessary the use of rubber-capped bottles for the issue, through the Emergency Public Health Laboratories, of alum precipitated toxoid. It has come to my notice that this has caused some embarrassment both in districts where general practitioners have been employed in the past to perform the inoculations as well as in others where it is proposed to employ general practitioners for this purpose in the future. As the dosage of alum precipitated toxoid recommended (0.1 c.cm. and 0.3 c.cm.) is a very small one, it is obvious that each bottle contains a large number of doses of the prophylactic and is suitable for use only in the inoculation of considerable groups of children collected together in appropriate centres.

It is important that the support of the medical profession should be secured if the benefits of immunization are to be fully understood by the public, and I hope that the practitioners in your area will do everything in their power to bring these benefits to the notice of their patients.

General practitioners are well qualified to perform the inoculations, and if it is decided to use their services you should arrange for their attendance at centres on a sessional basis."

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£29 8s.—Per Dr. R. A. Lattey, Torquay (amount already sent £127 1s.); Dr. D. Wilson, £10 10s.; Dr. and Mrs. B. T. Halliwell, £7 7s.; Dr. E. H. C. Earl, £5 5s.; Dr. C. Lord-Flood, £5 5s.; Dr. C. W. Lakin, £1 1s.

£6 6s.—Northamptonshire Medical Charity—per Dr. D. G. Greenfield (amount already sent £391 7s.). Dr. S. E. Bethell, £3 3s.; Dr. W. J. Baird, £3 3s.

£5 5s.—The doctors in Buteshire—per Dr. J. V. Thomson.

£4 4s.—Per Dr. P. V. Anderson, Bishop Auckland Division; Dr. P. V. Anderson, £2 2s.; Dr. H. G. Donald, £2 2s.

£3 6s.—Per Col. J. S. Dunne, Welwyn: Dr. C. Cardinall, £1 1s.; Dr. A. Barker, £1; Dr. P. Wood, 5s.; Dr. A. de S. L. F. Perigal, 10s.; Lt.-Col. J. S. Dunne, 10s.

£3 3s.—Per Dr. N. S. Twist—Wakefield L.M.W.C. (amount already sent £140 7s.): Dr. C. Neville Robinson.

£2 2s.—Per Lt.-Col. W. George—Lancaster L.M.W.C. (amount already sent £179 17s.): Dr. W. F. Lyle.

Local Medical and Panel Committees

£100—Bolton.

£64 7s. 5d.—Midlothian.

£50—Lincs. (Holland): Westmorland.

£42—Huddersfield.

£26 10s. 6d.—Barnsley.

£25.—West Suffolk.

£3 3s.—Birkenhead

Berkshire (£250, acknowledged under Reading Division).

Reading (£105, acknowledged under Reading Division).

Total—£13,900 11s. and £100 3½% Conversion Stock

BONUS OF OFFICERS OF LOCAL AUTHORITIES

Following representations by the British Medical Association, the Minister of Health has decided to withdraw his objection to the payment of cost of living bonuses to those officers of a local authority whose remuneration is subject to approval by him. After further consideration he has decided that he would not be justified in continuing to withhold his approval in the case of the particular officers concerned, where the proposal is to pay them the bonus being paid already to other employees of the same authority. He is accordingly prepared to sanction the payment of such bonus, during the period of its currency, to the officers referred to.

CAPITATION FEE OF POST OFFICE MEDICAL OFFICERS

The Post Office has agreed to raise the capitation fee of Post Office medical officers by 6d., this figure being comparable with the increase in the dispensing capitation fee recently awarded to dispensing insurance practitioners. It has further agreed to raise the fee for attendance on emergency or "itinerant" cases from 3s. to 3s. 6d.

Correspondence

Bush Nursing Hospitals

SIR,—Dr. W. Kent Hughes's, letter in the *Supplement* of August 31 (p. 20) is based on a misunderstanding. Four Bush Nursing Hospitals have been closed by reason of the absence of medical practitioners, and in three of these cases practitioners had worked for years and asked for the hospitals. The call of the city is overpowering, where there is no shortage. I am not aware of any offer being made to practitioners to accept a salary of £500 a year; but guarantees of £500, £600, and in one case £800 a year have been offered with the right to practise in addition; they have been, in general, unsuccessful.

The areas in which these hospitals are situated vary. In the Mallee the summer is hot, but the country is not treeless and the residents are fine, robust people. But for the moment two hospitals are in difficulties, though situated in nice townships and a country which reminds one of England—green, well watered, and prosperous. Yet in spite of these difficulties, greatly accentuated by the war, the Bush Nursing Hospitals continue to develop and now number fifty-eight. What is even more gratifying is that this co-operative system is extending to the outskirts of the city because of the superior accommodation, skilled nursing, and low charges. The maternal mortality in 18,623 cases is 2.2 per 1,000, really less, a fact which the women in the country appreciate.—I am, etc.,

JAMES W. BARRETT,
Honorary Secretary, Central Council, Victorian Bush Nursing Association.

Melbourne, Nov. 9.

WEEKLY POSTGRADUATE DIARY

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.—*Royal National Orthopaedic Hospital*, Stanmore.—Sat., 2.15 p.m. Final F.R.C.S. Clinical Orthopaedic Course. *Medical Society of London*, 11, Chandos Street, W.—Wed., Final F.R.C.S. Theoretical Orthopaedic Course. *Royal Cancer Hospital*, Fulham Road, S.W.—Daily, 9.30 a.m. to 1 p.m. Final F.R.C.S. Comprehensive Course; thrice weekly, 2 p.m. Final F.R.C.S. Operative Surgery Course.

TAVISTOCK CLINIC, Westfield College, Kidderpore Avenue, Hampstead, N.W.—*Sun.*, 3 p.m. Discussion: War Strain in Children: Its Manifestations and Treatment. To be opened by Miss A. T. Alcock.

DIARY OF SOCIETIES AND LECTURES

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At Royal Society of Medicine, 1, Wimpole Street, W. Lectures by Prof. H. A. Harris: *Mon.*, 3 p.m., Growth in General; *Tues.*, 3 p.m., The Anatomy and Physiology of Locomotion and Posture; *Wed.*, 3 p.m., The Inherent Weakness of the Human Body, with Reference to Orthopaedic Practice.

ROYAL SOCIETY OF MEDICINE

Section of Therapeutics.—Tues., 2.30 p.m. Discussion: Active Immunization—Some Present-day Problems. Openers: Dr. H. J. Parish and Dr. I. H. Maclean.

Section of Dermatology.—Thurs., 2.15 p.m. Short paper by Prof. P. A. Buxton; Some Recent Work on the Louse. Discussion: Prevention and Treatment of Parasitic Diseases. Openers: Dr. H. MacCormac and Dr. A. M. H. Gray.

VACANCIES

EXAMINING FACTORY SURGEON.—The appointment at Lewisham (London) is vacant. Applications to the Chief Inspector of Factories, Cleland House, Page Street, S.W.1, by January 14.

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

MARRIAGE

PEBERDY—LAWS.—On December 27, 1940, in Taunton, Geoffrey Robert Peberdy, M.D., D.P.M., Lieutenant, R.A.M.C., to Mary Laws, M.R.C.S., L.R.C.P.

DEATHS

CARROLL.—On January 4, 1941, at his residence, Prospect Villas, Church Lane, Harpurhey, Manchester, Patrick John Carroll, B.A., M.B., B.Ch., R.U.I.

KENNEDY O'BYRNE.—On December 30, 1940, at 15, Parklands Court, Hounslow West, Middlesex, John Moira Kennedy O'Byrne, L.R.C.P.S.I., in his sixty-first year.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 18 1941

TRENDS IN NUTRITION*

BY

SIR JOHN BOYD ORR, M.D., F.R.S.

The treatment of disease falls entirely within the sphere of the medical profession. There has consequently been little delay in applying the advances in our knowledge of nutrition to the treatment of deficiency diseases. But for the prevention of deficiency diseases we need a supply of protective foods sufficient for the needs of the whole population and at a price within the purchasing power of everybody. This involves economic and political problems which are regarded as being outside the sphere of medicine. There has for this reason been a greater delay in the prevention of deficiency diseases and the promotion of the higher standard of national health and physical fitness, which we now know can be attained by proper feeding, than in the advance of therapeutic dietetics.

Though progress has been slower in applying our new knowledge in preventive medicine a great deal has been attained in recent years by public health measures supplying milk, cod-liver oil, and other protective foods, free or at a cheap price, at child welfare centres, ante-natal clinics, and schools. These measures have helped to prevent the grosser forms of deficiency diseases among mothers and children of the poorer classes. One of the best features of this public health work is the closer supervision of health, with the earlier detection and treatment of diseases due to faulty diet.

In the present circumstances, when the whole nation is putting forth its maximum effort for victory, it is of the utmost importance that the entire population should receive a diet which will maintain the highest degree of health and fitness that can be attained by proper feeding. It is difficult to do this under war conditions. The valuable public health work which was rapidly eliminating the worst forms of deficiency diseases among the poor is liable to be to some extent dislocated, and the supply of certain of the more important protective foods, such as eggs and imported fruits, is decreasing. The newer knowledge of nutrition which is of practical value must be brought to bear upon the problem to enable us to get through the difficult war and post-war period not only without a worsening of the national diet but, if possible, with an acceleration of the rate of improvement in recent years.

This raises the question of what knowledge is of practical value. The science of nutrition has been advancing so rapidly that there is difficulty in judging what has been definitely established. There is much room for differences of opinion. In the leisurely times of peace, discussion and dispute, followed by further investigations to clear up the points in dispute, form a normal and natural aspect of research effort. Under the present hectic conditions there is no time for discussion on minor points. We must take the information that is regarded by the majority of the profession as established and concentrate our efforts on getting it applied. It is of interest, therefore, to consider what knowledge can be regarded as of immediate practical value. The main questions are: To what extent does malnutrition exist or, in other words, to what extent could national health be improved by better feeding? What are the effects of malnutrition on national health and physique? In what respects are diets deficient and how can the deficiencies be made good from the food resources available? And, lastly: What bearing has the new knowledge of nutrition upon the national effort for victory and upon schemes for post-war reconstruction?

The Extent of Malnutrition

It is generally agreed that "deficiency diseases" are due to faulty diet. But there must obviously be many gradations of ill-health, from the highest state of health, which can be attained by perfect feeding, to conditions so gross that they are referred to as diseases. There is not complete agreement on the extent to which intermediate stages of deficiency diseases account for the rather vague and indefinite ill-health which is so prevalent. Attempts have been made to estimate this by various means, but we are not unanimous as to the validity of the methods of assessment of the state of nutrition used nor of the findings obtained by these methods. It will be of interest to consider these and see what can be regarded as being generally accepted.

Methods of assessing the State of Nutrition

Physiological and Chemical Tests.—Tests such as the hemeralopia test for deficiency of vitamin A, and chemical examination of body fluids to determine the phosphatase level or the degree of saturation with various vitamins and minerals, are giving interesting results. But the significance of certain of these tests is still in dispute. For example, some workers cannot find a close correlation between the results of hemeralopia tests and the intake of vitamin A or between the results of these tests and clinical signs of deficiency of this vitamin, and not all workers are agreed that saturation with ascorbic acid is necessary for perfect health. The increase of knowledge may bring about modifications in these tests and in the standards by which the results are judged. The principles on which such tests are based and sound and in the near future

* Summary of a British Medical Association Lecture delivered to the Leeds Division on November 12, 1940.

they will be generally accepted as valid. Those who have been carrying out research in this field, such as Harris and his co-workers at Cambridge, have done invaluable work. At the present stage, however, all that can be said with certainty about the results is that they indicate that the diet of a large proportion of the people in this country is not up to the optimum, and that in some cases it is so deficient that clinical signs of deficiency might be expected.

Clinical Assessment.—Clinical assessment presents difficulties because in minor degrees of deficiency there are few clear-cut clinical signs or symptoms which arise from specific deficiencies and from no other cause. Thus, for example, in minor degrees of deficiency of vitamin B_1 there is loss of appetite and there may be vague aches and pains of a rheumatic character, cardiac and intestinal derangements, and mental symptoms. All these, however, may arise from psychological or material causes other than deficiency of B_1. The same applies to a large extent to signs of deficiency of other vitamins or minerals. Clinical signs which are easily distinguished and characteristic of specific deficiencies occur only in the later stages of deficiency diseases and therefore are of limited value in estimating the extent to which minor degrees of malnutrition occur. When, however, a more detailed examination is made—as, for example, by *x* rays for rickets and estimation of haemoglobin for anaemia—many cases of subacute malnutrition are seen to exist in children who show no gross signs of ill-health.

In the past the clinical training of the medical student has not made him well fitted to recognize minor degrees of malnutrition. The clinical material for his training consisted of hospital patients who were nearly all in a rather advanced state of ill-health, and the student was too apt to classify the population into two categories—those so ill that they required medical treatment, and the rest of the population not seeking medical treatment, the average health of which was regarded as the normal. This standard of health is far below what we now regard as attainable. In some schools physiological and clinical teaching has begun with subjects of perfect health and physique with the idea of imparting a proper standard of health.

Dietary Surveys.—An estimate of the extent of malnutrition can be got by comparing the kind of diet in common use in different classes with the modern standard of requirements. If these standards be correct, then it may be assumed that the people on diets markedly below these standards are likely to suffer from malnutrition. There are three well-known standards—the British Medical Association diet at minimum cost; the "Stiebeling" diet at moderate cost, published by the U.S.A. Government Department of Home Economics; and the League of Nations diet, which is an optimum one irrespective of cost. Crawford has converted the B.M.A. diets into their nutrient constituents, allowance being made in accordance with the B.M.A. recommendation for one pint of milk daily for children from birth to 5 years, half a pint from 5 to 10, and a quarter of a pint for other persons. When the three diets are reduced to their nutrient constituents it is found that there is close agreement between them, the Stiebeling diet at moderate cost being a little more generous than the B.M.A. diet at minimum cost, and the League of Nations optimum diet a little better than the Stiebeling one. These standards were drawn up independently by different groups of experts, and can be accepted as fairly reliable indications of requirements. When diets in common use are compared with these standards it is found that the average intake of some minerals and most of the vitamins among poor families with children is low.

Feeding Tests.—If we accept as our definition of malnutrition a condition which can be improved by improving the diet, then the surest method of estimating malnutrition is to do feeding tests. The results of tests such as those in which additional milk was given to school children, and the experiment with the modified Oslo breakfast done by Borland in 1938, show that the average degree of health, which is often taken as the normal, can definitely be improved in a large proportion of these children. The marked improvement in health and physique of young recruits on joining the Army is undoubtedly largely due to better feeding.

In the last twenty-five years the average consumption of protective foods in this country has increased by roughly about 50%, and there has been a corresponding remarkable improvement in national health, shown by the great reduction in deficiency diseases due entirely to better feeding, by the reduction in infant mortality rates and tuberculosis death rates, and by the improvement in health and rate of growth of children, which can be attributed largely to the same cause. Although there has been such an improvement the results of recent tests indicate that we have not yet reached the limits, or, in other words, there is still ill-health and poor physique which could be eliminated by dietary measures.

All these different methods of assessing the state of nutrition show the same general results. Physiological and biochemical tests indicate that the diet of a large proportion of our children is not up to the optimum. Clinical examinations, such as that made by the Board of Education on rickets in London and Dr. Spence's examination of Newcastle pre-school children, disclose a considerable amount of malnutrition. A comparison of the diets in use with recognized standards shows that large numbers of the population do not receive a diet up to the standards which we now regard as being necessary for health; and, finally, feeding tests with children reveal that improvement of the diet is followed by a corresponding improvement in health. Even allowing for the fact that none of these methods of assessment is absolutely reliable, there can be little doubt about the conclusion, since the same general result is obtained independently by each method. The time is not opportune for discussing what proportion of the population is below the standard of health which we now know can be attained by proper feeding. It is sufficient for our purpose if there is general agreement that there are substantial numbers whose health and physique can be improved.

Effects of Malnutrition: Primary

The primary effects of malnutrition as seen in the deficiency diseases are well known. Only one—the effect on working efficiency, which is of special importance at the present time—need be referred to here. The improvement of the diet of workmen whose diet was not previously up to the standard for health is followed by increased output without any conscious increased effort and also by a reduction in the number of accidents. Many factories are now providing a meal for employees. It is likely that, as part of the national effort for increased output of war material, the provision of a meal will be made compulsory in all factories and measures be taken to ensure that the meal is on the lines of the Oslo breakfast, which will make good the deficiencies of the portion of the diet eaten at home.

Secondary

(*a*) *Infection.*—It is only in recent years that systematic research has been done on the influence of nutrition on susceptibility to infectious disease. About fifteen years ago the subject was investigated by a group of workers

associated with the Rowett Institute, including Prof. Mackie of Edinburgh and the late Prof. J. J. R. McLeod. In experiments with farm animals it was found that certain immunological reactions were considerably affected by the nature of the ration. In direct feeding experiments with rats, in which an infection was introduced into groups of the animals fed differently, it was found that with some infections, though not all, the mortality rate among those on a deficient diet was markedly higher than among those on an adequate diet. The results of these tests are complicated by acquired immunity. It is exceedingly difficult to get large groups of animals completely free from any previous infection which may complicate the results. That condition, however, has been obtained in Professor Topley's department at the London School of Hygiene and Tropical Medicine. His workers found that susceptibility to some infections is affected by diet. Thus, for example, well-fed mice are less susceptible to enteric than comparable animals on a poor diet.

These researches confirm clinical findings such as the increased susceptibility to infections of the cornea in deficiency of vitamin A, the frequent occurrence of bronchopneumonia in children suffering from rickets, and the effect of feeding on tuberculosis. While our knowledge of the effect of diet on immunity to infection is still very limited there can be little doubt that well-fed people are less susceptible to some infections, at least, than ill-fed people, and that the sequelae to many infections such as measles are likely to be more severe in children on a deficient diet.

This is a subject of considerable importance at the present time, when there is a displacement of the population. Endemic diseases in communities which have acquired immunity are apt to be spread to other sections of the population with little or no immunity. In addition to sanitary methods, and widespread immunization in the case of diseases where this method can be effectively employed, there is urgent need to increase the resistance of the people by improving their state of nutrition.

(*b*) *Psychological.*—An aspect of this subject which has so far received little attention is the psychological effect of malnutrition. This is especially marked in those suffering from pellagra, a proportion of whom end up in asylums. Vitamin B_1 deficiency in adults is accompanied by apathy and despondency, and in infants a typical symptom is the whining, whimpering, pathetic cry. A low blood calcium is accompanied by hyperexcitability. Women suffering from nutrition anaemia are usually apathetic, peevish, and easily discouraged. It is doubtful whether there is any physical symptom of malnutrition which is not accompanied by a psychological symptom.

This aspect of malnutrition is now receiving a good deal of attention by educationists. The number of dull or backward children, according to Segar, varies from about 1% among well-to-do families to 20% amongst the poorest families. Many intelligence tests have been used in an attempt to ascertain whether there is a correlation between nutrition and intelligence. As mental ability is an inherited characteristic it is doubtful whether the results of such tests, from one point of view, are of much value. The power to use intelligence, however, depends upon the state of health. A badly fed child suffers from early onset of fatigue and lack of power of concentration, and consequently is slower to learn. In some tests it has been found that supplementary feeding of milk and other protective foods has been followed by a definite improvement in the ability of the child to learn lessons. In a test which covered a period of five months the educational advance in that period was equivalent to the advance normally made by these children in two years. It is estimated that out of between five and six million school children five hundred thousand are dull or backward. While it may be going too far to label these children not mentally deficient but nutritionally deficient, as has been done by one American investigator, there seems little doubt that the number would be drastically reduced if their diets were made adequate. There is some apprehension at the wartime interference with the education of our children. If means were taken to ensure that every child was properly fed it is probable that the interference with the normal educational machine would be compensated for by the greater physical and mental vigour of the children.

In the present circumstances, when all sections of the community are being subjected to the emotional strains of war conditions, this aspect of nutrition assumes great national importance, both for adults, whose working efficiency and morale must be maintained at the highest possible level, and for the children, who when they grow up will need all their physical and mental powers to clear away the wreckage of the present war and build the new and better post-war world for which we are all hoping.

Characteristics of Deficient Diets

So much work has been done and so much written about the effects of deficiencies of the different vitamins or minerals that we are apt to think that improvement of the diet consists in making good these individual deficiencies. In the treatment of gross deficiency diseases vitamin concentrates are useful. They are of less value, however, in dealing with minor degrees of malnutrition, because poor diets are deficient not in one but in many constituents, and if the intake of one be increased the intake of some other immediately becomes the limiting factor for health. What we are dealing with is not diets deficient in one or two constituents but diets deficient in many. In tests the improvement got by giving one nutrient, such as vitamin A, is negligible compared with the improvement obtained by giving milk, which is rich in most of the elements deficient in a poor diet. This is well exemplified in the case of teeth. Deficiencies of vitamins D, A, and C, of calcium, and of magnesium; the effect of carbohydrates in promoting the growth of *B. acidophilus odontolyticus*, which attacks the enamel: mechanical chewing, which affects the growth of the jaws and the tooth-spacing, all help to determine the condition of the teeth. But the correction of any one of these factors will not ensure healthy teeth. Schiötz found in his extensive investigations that of children who had perfect teeth some had had cod-liver oil, some had not; some had been given sweets, some had been kept off sweets; some had brushed their teeth and some had not. But every child who had perfect teeth had had an abundance of milk and green vegetables regularly, without a break. These together supply all the known factors needed for healthy teeth, and possibly also as yet unknown factors. It has been decided to put vitamin B_1 and calcium into white bread. This will certainly to some extent improve diets deficient in these substances, but Harriette Chick's experiments have shown that white bread plus B_1 and calcium is by no means equivalent to wholemeal bread, which contains, in addition to these factors, several others which are equally important.

In planning for a perfect diet we should depend not so much on attempts to provide a sufficient amount of any specific nutrient as on ensuring that the intake of the protective foods is ample. We do not yet know all the dietary constituents which are essential for health, but we do know that a sufficiency of the protective foods will supply everything which the body needs. Fortunately,

everything can be supplied by a few foods—e.g., milk, green vegetables, wholemeal bread, and potatoes. These, taken together in sufficient quantity, would meet all bodily needs for specific constituents.

This is of importance at the present time, when the supply of some of our foods, such as eggs and imported fruit, will be reduced. This country can produce enough milk, vegetables, and potatoes to meet the needs of the whole population, and there is no insurmountable difficulty in making wholemeal bread available. The change over to increased consumption of these protective foods will involve an alteration in dietary habits. The chief change needed for health is to bring the consumption of milk and vegetables among the poor up to what it is among the well-to-do. At a time when all classes are prepared to make sacrifices there should be no difficulty in getting people so to adjust their diets as to increase the consumption of those foodstuffs which can be made available in sufficient amounts, especially as the main feature of the adjustment would be a levelling up of the diet of the poor by increased consumption of protective foods which we can produce at home, and the limitation, without necessary deterioration, of the diet of the well-to-do by reduced consumption of less essential foods.

Even though our agricultural policy were adjusted to provide milk, vegetables, and potatoes in amounts sufficient for the whole population there remains the problem of making them available at a price within the purchasing power of everybody. The Ministry of Food is engaged on a great educational campaign on the nature of body-building foods, protective foods, and energy-yielding foods. The value of this campaign would be greatly increased if specimen diets were given for families with three, four, or five children, and the price of the food stated, showing that families of low-wage earners, unemployed, and men in the Fighting Services could purchase these diets with the income available for food. The Canadian Medical Association has published an excellent booklet showing the kind of diet needed for different families and the cost, and has thereby adjusted propaganda to economic realities.

Nutrition only One Factor needed for Health

Such spectacular results have been obtained in the treatment and prevention of disease by dietary measures that there may be a danger, especially on the part of those working on the subject, of forgetting the importance of other factors. Bad housing and overcrowding, which facilitate the spread of infectious disease; the psychological effects of overcrowding; and the feeling of frustration, worry, and anxiety, and of impotence in the face of environmental difficulties common among the poor, are probably as potent causes of ill-health as faulty diet. These factors will react on one another and reinforce each other. Until they have been eliminated we will not be able to attain the high standard of national health and physical fitness which we know can be attained. They all tend to be associated with poverty.

In the last hundred years the medical profession has developed great resources for the treatment of diseases arising under these conditions. It is now recognized that the duties and responsibilities of the profession must be extended to include the prevention of disease and, further, the promotion of health. When we enter this sphere we are faced with the environmental conditions which affect health and with the associated social, economic, and political factors. The Report of the British Medical Association Committee on Nutrition, and the "Aylesbury Broadside," published by the *Lancet*, show that the profession has the vision and the courage to take cognizance of these factors. The profession must extend its work in this new sphere if it is to play a part commensurate with its great influence and prestige in building up the new and better world for which all men are hoping.

Medicine and the New World Order

The different ideologies which are in conflict promise a new world order. In our own country Mr. Bevin has said that after the war the miseries of poverty will be relegated to the limbo of the past, and Mr. Churchill has declared that we shall go forward in "the march of the common people towards their just and true inheritance and towards the broader and fuller life." Groups of economists and others are already planning, and indeed the Government has recently set up a special department to work out schemes for post-war development.

But we cannot with safety leave the planning of the future to political parties. As the *Times* in a leading article on a speech of President Roosevelt's says, "The gravest danger to democracy lay in the growth in some quarters of a cynical belief that the attitude to the all-important party machines was determined less by the voters than by the economic interests of those who provided the party funds." Nor can we leave it to the economist, who is too apt to think that prosperity consists of a trade boom. The miseries of the slums and the poverty created during the tremendous industrial and trade prosperity of the nineteenth century have convinced all thinking people that trade prosperity and the welfare of the working classes are not necessarily correlated. We must plan for the satisfaction of human needs as well as for trade prosperity.

The medical profession contains within it experts on every subject that affects human welfare. It is the only organized group of men competent to make a statement on human needs. The first essential need for a fuller life for the common people is the provision of environmental conditions which will enable them to attain their fullest inherited capacity for physiological and mental well-being. The British Medical Association might well set up a committee to report on the minimum material and psychological needs for full physiological and mental well-being. It could then, with the authority of the whole profession, recommend that in post-war planning effort should be directed first and foremost to the satisfaction of those needs for the whole population.

Some needs, such as better housing, cannot be dealt with during the war, but others, such as the provision of an adequate diet for everybody, could be met even during the war if we had an agricultural and food policy based solely on the nutritional requirements of the people. If this, the most fundamental need, were met, at the end of the war, even though we were poorer in other respects, we would have taken the first and most important step in the march of the common people to the fuller life, and the provision of plans for meeting other needs would give enthusiasm to continue the march and also confidence that we were travelling in the right direction.

Unfortunately, in the past, as Dr. R. W. L. Ward has pointed out in a recent letter to the *Journal*, the profession has been too much occupied with its own remuneration and failed to recognize its responsibilities towards the bigger issues of national life. At the present time, when the artisan trade unions are surrendering rights and privileges which have been won after such arduous struggles and are throwing the whole weight of their influence into the prosecution of the war in the hope of obtaining a new and better order, the medical profession must do its utmost to ensure that the better order which will compensate for all the sacrifices of the war will in fact materialize. It should assume that it is the custodian of

the health of the people and that it is its duty to define the environmental conditions necessary for the higher state of health which medical science considers can be attained. There is not the slightest doubt that the brave words of Churchill and Bevin are spoken in earnest and that they and other national leaders who are anxious to reorganize our social and economic system for the benefit of the common people would welcome an authoritative statement from the medical profession on the kind of conditions we should plan for. If the profession is willing to make its full contribution to the national effort for victory and for the equally important post-war reconstruction it should begin to do so now.

A CASE OF PULMONARY CONCUSSION ("BLAST") DUE TO HIGH EXPLOSIVE

BY

GEOFFREY HADFIELD, M.D., F.R.C.P.
Professor of Pathology, St. Bartholomew's Hospital

AND

RONALD V. CHRISTIE, M.Sc., M.D., M.R.C.P.
Professor of Medicine, St. Bartholomew's Hospital

It is now well recognized that a proportion of individuals who are exposed to the detonation of high explosive develop pulmonary haemorrhages without any significant injury to the thoracic wall. The number of recorded cases in which such patients have been closely observed and have subsequently died is still quite small. Such a case is recorded below.

Case Report

In November, 1940, a bomb fell on a wooden hut in which the patient, a soldier aged 23, was asleep. No details are available of the immediate effects of the explosion or of the condition of the patient at this time except that he was given morphine 1/4 grain at 4.40 and 1/3 grain at 5.20 and 3,000 units of anti-tetanus serum at 5.30, when he was transferred to hospital.

On admission he was "shocked," dyspnoeic, and cyanosed, and rales could be heard scattered throughout the chest. He had pain in the chest and abdomen and vomited some blood-stained fluid. The abdomen was tender and rigid. The temperature was 100°, and the pulse rate 130 and the respiratory rate 30 per minute. He was given heroin grain 1/12 and atropine grain 1/100, and oxygen was administered. His condition gradually improved. On the morning after admission tubular breathing with an impaired percussion note was found at the left base, but the scattered rales were less conspicuous. A radiograph of the chest showed a diffuse, mottled, woolly shadow throughout the left lung. On the right side there was a similar shadow in the mid-zone and extending out to the periphery from the hilus. The abdomen was still tender and vomiting continued. The temperature was 98.6°, and the pulse rate 120 and the respiratory rate 24 per minute.

It was decided in consultation that the patient should be sent to another hospital, and he was first seen by us thirty-nine hours after the explosion. He was restless and looked ill with high colour and slight cyanosis. There was considerable dyspnoea, with dilatation of the alae nasi on inspiration, but no orthopnoea. He was extremely irritable and resentful of interference, drinking greedily but vomiting large amounts of thin brownish watery fluid which gave a faintly positive guaiacum reaction. His temperature was 99.6°; the pulse rate was 120 and respirations 36 per minute. The tongue was dry and furred. Blood pressure was 126/76. There was generalized tenderness, which made accurate percussion and examination of the back of the chest inadvisable. Movement was diminished on the left side and the breath sounds were obscured by loud rhonchi and scattered coarse rales. The abdomen was distended with flatus and the abdominal wall was rigid and tender. An acute intra-abdominal lesion was suspected, although there was no dullness in the flanks, the liver dullness was not impaired, and bowel sounds were audible. Attempts were made to administer oxygen by means of a B.L.B. mask and spectacle frame, but the patient resisted and would tolerate neither. At 8.30 p.m. his general condition appeared unchanged, although the pulse rate had risen to 140 per minute and there was some congestion of the veins in the neck. His blood pressure was 136/84 and the haemoglobin 125% (Hellige colorimeter).

At this time the indications for treatment seemed somewhat confusing. The furred and dry tongue, the haemoglobin percentage of 125, and the rapid rate of the pulse suggested that plasma should be given. On the other hand, the height of the blood pressure, the distended veins in the neck, the bubbling rales in the chest, and the general appearance of the patient strongly suggested that a venesection should be performed. We decided to do neither, hoping this was a transient crisis precipitated by the journey from the first hospital. As the patient was quiet if left undisturbed, morphine was withheld and he was closely watched. At 11 p.m. it was obvious that his condition was deteriorating. He developed a distressing hiccup, the bubbling rales in his chest could be heard at the end of the bed, his cyanosis was increasing, and the veins in his neck were distended up to the angle of the jaw. The temperature was 102.2°, the pulse rate 144, and the respiration 48. Morphine grain 1/6 was given, but the condition of the patient began to deteriorate even more rapidly. 600 c.cm. of blood was then withdrawn, and this was followed by spectacular improvement. The bubbling rales in the chest rapidly diminished; the patient was quieter, was less restless, and was breathing more easily, and he fell into a light sleep. His blood pressure was not measured lest it disturb him, but the quality of his pulse suggested that it was being maintained at its previous level.

At 5.30 a.m. the patient became much worse and was restless and delirious. The rate of the pulse was 140 per minute, and its volume was poor; there was a systolic blood pressure of 44 mm. Hg, but no congestion of the veins in the neck. The respiratory rate again increased to 40 per minute, but no rales could be heard in the chest anteriorly except in the left axilla. The haemoglobin was 100%. Oxygen was administered with a B.L.B. mask and, as no plasma was immediately available, a transfusion of blood was begun. After the patient had received one-third of a pint clotting occurred. He was then moribund, and died at 7 a.m.

In a sample of blood taken at 11 p.m. the blood urea was 86 mg. per 100 c.cm. and the alkali reserve 60.5 c.cm. per 100 c.cm. plasma.

Post-mortem Examination

The body showed no external signs of injury except a small superficial abrasion on the bridge of the nose. The upper air passages were normal except that they contained a moderate amount of lightly blood-stained thin and frothy mucous fluid. The pericardial fluid was lightly blood-tinged. There were some petechial haemorrhages between the parietal pleura and the thoracic wall and a few larger haemorrhagic areas up to the diameter of a five-shilling piece in size. These were composed of thin laminae of dark blood and were not associated with any recognizable fracture of the ribs or trauma of the thoracic parietes. There was no excess of fluid in the pleural sacs.

Both lungs were large. At least two-thirds of the bulk of the left and about half the bulk of the right lung were consolidated. The visceral pleura showed no laceration, but there were several extensive dark irregular haemorrhagic areas beneath the pleura of both lungs, chiefly disposed about the posterior and basal regions; the largest was roughly rectangular, and measured about 6 by 5 cm. All these lesions were subsequently shown to be continuous, with large foci of deeply seated resolving haemorrhage.

Most of the consolidation in the left lung was basal, posterior, and deeply placed, but there were solid areas deep in

the substance of the upper lobe. The colour of the consolidated parts was that of dark venous blood clot, but their ill-defined edges were bright red, fading off gradually into normally coloured lung. Throughout this dark-coloured consolidated lung there were many scattered areas of ashen-grey in colour and sharply demarcated from the surrounding tissues. The larger areas were about 2 by 1½ cm.; and were roughly polygonal in shape. The light red margins of the consolidated areas were firm and elastic; the deeply coloured solid lung was wooden in consistency and quite elastic; the ashen-grey foci were firm but friable.

The lesions in the right lung were similar to those in the left but not so extensive, and whereas a large portion of the left lower lobe appeared to be occupied by a lesion roughly resembling a massive organizing pulmonary infarct, the lesions in the right lung were smaller and more widely scattered. The sharp demarcation of the ashen-grey areas was just as noticeable in the right as in the left lung.

A few small submucous haemorrhages were found in the body of the stomach and there were recent symmetrical subarachnoid haemorrhages over the convexity of each occipital lobe extending forwards for about 4 cm. from each occipital pole. These haemorrhages were not severe in degree and there was no naked-eye evidence of damage either to the overlying skull and dura or to the underlying brain.

On histological examination of the consolidated lungs the macroscopic changes were seen to be largely the consequence of widespread intra-alveolar capillary haemorrhage. In the dark firm elastic areas the appearances bore a striking resemblance to those found in haemorrhagic infarction. There was the same preservation of the outline and structure of the alveolar walls, the same tight packing of the alveoli with partly haemolysed and rather poorly staining red cells, and the same lack of free tracking of blood through the substance of the lung. There was no microscopic or macroscopic evidence of tracking of air through the lung, as one might expect to find if there had been alveolar rupture of any degree. The general resemblance to infarction and the lack of convincing evidence of widespread alveolar rupture incline us to the belief that the haemorrhage in this case arose from diapedesis or from the rupture of grossly dilated capillary vessels. This view receives some confirmation from the fact that a considerable degree of generalized capillary dilatation was found in sections taken from air-containing parts of the lung unaffected by haemorrhage.

No striking or constant change was observed in the air-conducting system of the lung, but in all sections of the regions showing haemorrhagic consolidation there was a rather striking degree of dilatation of the respiratory bronchioles and alveolar ducts.

An unexpected and rather surprising histological picture was presented by the ashen-grey friable areas lying in the midst of the massive areas of haemorrhagic consolidation. Here every alveolus contained a precisely staining close-meshed fibrin network in the meshes of which considerable numbers of wandering cells and partly haemolysed red cells were lying. The general appearance under the low-power bore a rather striking superficial resemblance to that of lobar pneumonia in the stage of red hepatization.

Closer examination of the wandering cells showed them to be predominantly monocytic. The capillaries in the alveolar walls were considerably dilated, and towards the edges of these areas of pseudo-pneumonic consolidation more and more alveoli were seen to contain coagulated protein with a scantier fibrin network and fewer cells. There was the same general preservation of the alveolar walls in these areas as was found in the frankly haemorrhagic parts of the lung and the same degree of dilatation of the respiratory bronchioles and alveolar ducts.

These appearances bear more than a superficial resemblance to those found in the lung in those cases of rheumatic infection dying of acute cardiac failure which show the condition known as "rheumatic pneumonia."

Sections taken from the peripheral parts of the areas of haemorrhagic consolidation where the lung was firm and airless but bright red in colour showed all alveoli in these areas to be fairly tightly packed with fresh, well-staining, fully haemoglobinized red cells. Wandering cells were absent and there was no fibrin formation. The alveolar walls were for the most part intact.

Discussion

The changes seen in these peripheral areas bore a striking resemblance to the appearances found in the lungs of patients dying soon after exposure to the detonation of high explosive, in which cases recent pulmonary haemorrhages are so often found post mortem. In reviewing a series of post-mortem examinations of seventeen of these cases we have been struck by the variability in extent of these haemorrhages, and it appears reasonable to relate this variation to the period of survival after exposure to detonation. In the case here described the survival period was longer than in any case we have previously observed and the haemorrhagic areas were considerably larger.

These facts should be taken in conjunction with the observation that the areas of haemorrhagic consolidation were surrounded by deep zones of recent bleeding, and we are inclined to believe that patients who develop pulmonary haemorrhages without external trauma to the thoracic wall after the detonation of high explosive continue to bleed into the lung for a period which may amount to forty-eight hours or so.

It would be dangerous to draw any definite therapeutic conclusions from a single case observed for so short a period. It seems probable, however, that on admission the patient was suffering from acute pulmonary congestion bordering on acute pulmonary oedema, and that venesection might well have been performed earlier. The use of concentrated serum was considered, and might have been employed. It also seemed clear that at 5 a.m. the patient passed into a state of "shock" and that the great improvement following venesection had led to a false sense of security. Although he was asleep his blood pressure should have been taken more often, and a plasma transfusion should have been given when it had fallen.

This patient also illustrates the dangers involved in transport by ambulance. When he left thirty-six hours after the explosion his condition had improved and, in the consultation which decided his transfer, he was considered to be quite fit for the journey. When first seen by us his condition was poor and gave obvious cause for anxiety. In the light of the post-mortem finding of continued bleeding it seems clear that these patients should be rested as strictly as if they had had recent severe haemoptysis.

The interpretation of the signs referable to the cardiovascular system is difficult. The bubbling rales in the lungs with dyspnoea and engorgement of the vessels of the neck suggested severe congestion of the pulmonary vascular bed, and this interpretation was supported by the marked improvement after venesection and by the post-mortem appearance of the lung. On the other hand, if there was any change in the blood pressure it was in the nature of a rise, and it is not easy to reconcile this with any serious impairment of blood flow through the lungs.

Summary

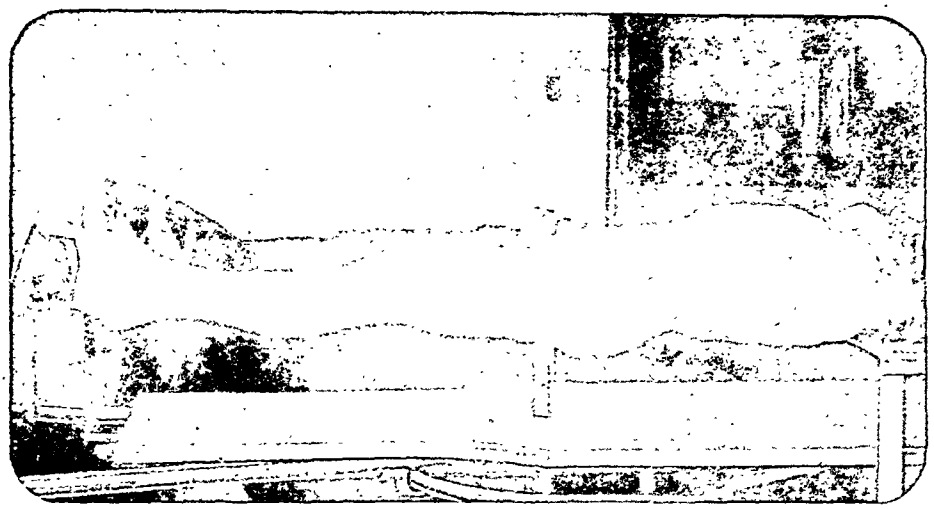
A case is reported in which a man aged 23 lived for fifty-one hours after exposure to the detonation of high explosive.

The clinical picture is described and certain suggestions as to treatment are made.

Reasons are given for regarding the pulmonary haemorrhage as being progressive and associated with pulmonary congestion.

Throughout the areas of haemorrhagic consolidation in the lung there were many foci superficially resembling pneumonic consolidation; these are described.

We are greatly indebted to Dr. J. N. O'Reilly for his co-operation in the investigation of this case.



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HAEMORRHAGE INTO THE LUNGS IN CASES OF DEATH DUE TO TRAUMA

BY

JOAN M. ROSS, M.D.
Pathologist in the E.M.S.

When changing circumstances bring a lesion to the notice of a morbid anatomist as a manifestation of a new aetiological factor it is well to review the past experience of the lesion and to detail, so far as possible, the variations that have been observed. Under war conditions fatalities have occurred in which the outstanding post-mortem finding has been haemorrhage into the tissue of the lung. Reviewing the peacetime incidence of haemorrhage into the lung in association with death from trauma, it must be recalled that such a lesion may occur in various conditions.

Peacetime Injuries

Blood may be inhaled after haemorrhage from lesions of the upper air passages or nasopharynx, or even from a fracture of the base of the skull. The blood in these cases will be found in the bronchi, bronchioles, and filling the respiratory bronchioles and alveoli in a lobule, giving the appearance of haemorrhagic areas approximately wedge-shaped but with lobulated margins. These bloody foci are likely to be more numerous in the lower lobes. The lung tissue is undamaged, and in the absence of previous pulmonary disease the microscopical appearance is that of normal respiratory bronchioles and alveoli filled with fresh blood. In cases in which the inhalation is not immediately fatal coagulation of the blood will have taken place.

A lacerated wound of the lung associated with haemorrhage may occur after penetration of the chest wall by a sharp object—the spike of an iron railing, a part of a motor-car, or some weapon: a similar condition in the lung is produced by a broken rib if driven inwards. The appearances here vary according to whether the penetrating object or rib remains in the lung while respiration continues. The pleura being damaged, there will probably be a pneumothorax and probably also a haemothorax. The injury to the pleura and gross disruption of the tissue of the lung are usually apparent on naked-eye examination. The resultant haemorrhage into the lung varies with circumstances. It may spread for some little distance beyond the margins of the wound.

Haemorrhagic lesions (contusions or bruises) of the lung may be found in cases which show no penetrating wound of the chest and even those in which no ribs are broken and no injury to the chest wall is apparent. Such cases are comparatively frequent in road accidents: they may be found after the violent impact of a moving vehicle or when the victim is hurled against a hard obstacle such as a wall. In children it is most often associated with a history of the rapid passage of a wheel over the thorax. The presence of extensive internal injuries without external evidence of violence is much more common in children than in adults. The haemorrhagic lesion in the lung takes the form of a contusion or localized bruise of some part of the organ, the localization being determined by the direction of the force and the situation of the maximum point of impact on the chest wall. Quite often there is a separation of the lung tissue where the organ has been nipped against the vertebral column. Scattered multiple haemorrhages are infrequent. As a rule there is no associated emphysema, but patients surviving for a few minutes may show all grades of interstitial emphysema when the lung is severely contused. Haemothorax is quite common. Microscopically there is rupture of the lung tissue and haemorrhage into the damaged area.

In another group of cases death may be said to be due to asphyxia. It has been recognized since Tardieu's time that asphyxia from any cause produces haemorrhagic lesions in the lungs. The lesions consist of punctiform subpleural haemorrhagic patches. They are dark in colour and vary in size from 1 to 5 mm. in diameter. Sometimes they are larger. These ecchymoses—Tardieu's spots—are sometimes separated, sometimes in groups. The outline is generally distinct and well defined on the surface. They are most common about the root of the lung at the lower margin and on the pleural surfaces between the lobes. They are usually associated with similar lesions on the other serous surfaces—the pericardium and the peritoneal surface of the diaphragm, etc.—and in the thymus in children. On suffocation the lungs will show congestion as well as Tardieu's spots. In asphyxia due to pressure on the trachea (strangulation) there will be frothy blood-stained mucous fluid in the upper air passages and intense congestion of the lungs, and, in addition to Tardieu's spots, larger patches of haemorrhages may be present in the substance of the lung. Where there has been continued compression of the thorax the haemorrhage into the tissue of the lung will be greatest where the ribs have pressed against the pleura.

Another type of case in which localized haemorrhagic lesions have been said to occur is that in which fat embolism is the cause of death. With reference to this it may be stated that it is not the experience of most morbid anatomists who have dealt with any numbers of deaths of a violent nature that fat embolism of the lung produces any localized haemorrhagic lesions which can be distinguished macroscopically. The lungs of patients dying of fat embolism following crushing injury to the bones, joints, or adipose tissue are typically deeply congested throughout, with no localized haemorrhagic patches.

Wartime Injuries

Having reviewed the haemorrhagic lesions of the lung due to trauma as they were seen in peacetime, it remains to compare the lesions produced as the result of the detonation of high explosive. It is possible to place some cases in the groups already summarized.

Flying missiles—bomb-casing and secondary mobilized fragments of masonry, metal, or wood—produce penetrating wounds of the chest and lacerated wounds of the lung differing in no way, except in degree, from those lesions described above. Impact damage from these missiles, or forcible hurling of the victim by the force of the explosion ("blast"), may produce contusions of the lung such as are all too familiar in road accidents. These contusions may presumably be found without visible external injury.

Cases of asphyxia are probably frequent under conditions due to bombing, where casualties may be buried under debris. These cases may be considered in two groups: in the one there has been inhalation of a large amount of dust: in the other the victim has been pinned under a pile of debris. In the former group the post-mortem findings are those of asphyxia only. Cyanosis is present: frothy mucus may be mixed with the solid inhaled material: and the lungs show congestion and some small scattered haemorrhages throughout and Tardieu's spots on the pleural surface. These ecchymoses are found in varying numbers under the parietal pleura and on the

peritoneal surface of the diaphragm. The other group is of considerable interest as it is possible to construct from examination of these cases a picture of the lung changes in compression asphyxia.

In cases of compression asphyxia where the victim has been buried under debris death has presumably been slow, with attempts at respiration. In such conditions rib markings have been observed; a dark purple line of the size and direction of the rib is seen, with emphysematous bullae visible at the margin of the dark rib marking. In addition these cases showed some scattered haemorrhages into the lung, with subpleural Tardieu's spots. There are localized areas of collapse. Microscopically there is disruption of the alveolar walls where the rib marking has been sectioned. There is fresh blood in the alveoli, and clotting may have begun in some areas. Elsewhere there is general congestion of all the capillaries in the alveolar walls and a considerable number of thromboses in smaller arterioles and veins. Oedema is present in many areas.

So far it has been possible to correlate these wartime injuries with peacetime parallels. Another group is without parallel. This includes cases in which death may be found to have occurred without or with only trifling external injury, but in which intrapulmonary haemorrhage has been a post-mortem feature common to them all. These cases have all been found near to the site of explosion of a bomb. In view of this fact the condition may well be called "haemorrhagic pulmonary concussion"; it may or may not be due to blast from the high explosive. It may prove to be of interest in the elucidation of the actual causes of this concussion that where these pulmonary lesions have been found and there have been external markings of small splinters, etc., the superficial lesions have all been on the anterior surface of the body.

Subpleural haemorrhages are not conspicuous and haemorrhagic rib markings are not present in the pleura. The haemorrhagic areas are scattered through, and often deep in, the substance of the lung, most often posteriorly and towards the base. The degree of haemorrhage varies considerably, but both lungs are affected to the same degree.

Comparing the histology of these cases with that found in compression asphyxia, it is seen that oedema is not a feature. Thromboses are not present. The haemorrhage in those patients found dead is fresh, and clotting has not occurred. There is widespread and intense capillary congestion in the lungs. There is haemorrhage into the walls of the small bronchioles, but absence of bleeding into the walls of the bronchi. There is some over-distension of air vesicles and respiratory bronchioles in some cases, but there is no anatomical relation of these to the ribs.

At the present time it is not known how many of the air-raid casualties dying with gross fatal injury, apparent externally, show pulmonary lesions such as these, but it is beyond question that these appearances are a definite morbid entity distinct from conditions hitherto familiar, and are distinguishable on careful analysis from lesions due to compression asphyxia or to pulmonary haemorrhage due to impact of solids against the thoracic wall.

Conclusion

The main points of difference may be summarized as follows:

In compression asphyxia the lesions may be symmetrical on both sides, but not necessarily so. The haemorrhages are usually subpleural and in the lines of the ribs. Emphysema may outline these rib markings. There is generalized congestion of the lungs and some oedema. Tardieu's spots are nearly always found.

In haemorrhage due to impact of a solid the haemorrhage is in relation to the point of maximum impact and may be unilateral. The lung tissue is contused, torn, and filled with blood at or around this point.

In haemorrhagic concussion the lesions are always bilateral and roughly symmetrical. There is general congestion of the lungs. Pleural haemorrhages are present only as an extension from deeper areas.

FAMILIAL PERIODIC PARALYSIS

BY

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The following brief study of two cases of familial periodic paralysis is recorded because of the rarity of the disease. The patients were brothers recently enlisted in different units, and their disability was first noticed after exercise. The chemical investigations were limited by military conditions and are by no means complete.

Familial periodic paralysis is characterized by sudden attacks of flaccid paralysis in one or more muscle groups, generally in the limbs. The paralysis is usually symmetrical. The trunk muscles are seldom involved, and much more rarely the muscles supplied by the cranial nerves. There is a complete loss or diminution of the tendon reflexes in the affected muscles, and usually the electrical excitability to both faradic and galvanic currents is lost or diminished. The duration of the attacks varies from a few hours to three or four days. They vary greatly in frequency, occurring every few days or at intervals of several months. Sphincter control is rarely affected, and very infrequently death occurs from respiratory paralysis. Biemond and Daniels (1934) have described a muscular atrophy developing in later life in the muscles most affected by the paralysis, but this complication is rare. There is usually little difficulty in diagnosing the cases with a familial incidence, but occasional sporadic cases occur which may be regarded as hysteria.

Until recently the factors causing the disease, apart from the inherited predisposition, have remained obscure. The first real advance in the understanding of the condition was made by Aitken, Allott, Castleden, and Walker (1937). These observers found that during the attacks of paralysis there was an abnormally low serum-potassium level and that the paralysis could be cut short by the administration of potassium chloride by mouth. They also found that paralysis could be induced by giving large amounts of glucose by mouth, either alone or together with insulin injections. These observations were confirmed in two further cases by Allott and McArdle (1938).

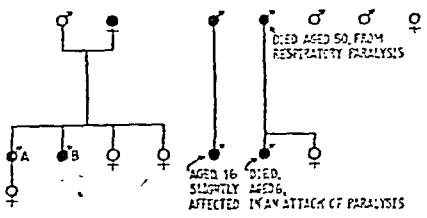
The fall in the serum-potassium content had been observed by Biemond and Daniels (1934), but they did not realize its significance. Treatment with potassium salts was mentioned as early as 1902 by Mitchell, Flexner, and Edsell, also by Holtzapple in 1904, and by Herrington in 1937. Holtzapple used potassium bromide, and ascribed the benefit to the bromide rather than to the potassium. Herrington used potassium citrate in 5-gramme doses with success in two cases.

In the first case here recorded the attacks of paralysis could be induced by giving large doses of glucose. During an attack the serum-potassium level was found to be low. Potassium salts by mouth caused a rapid disappearance of the paralysis, with a simultaneous rise in the serum-potassium level. Attempts to induce paralysis in the second case were unsuccessful, and apart from the history there is no definite evidence that this patient suffered from the disease.

Case I

Gunner A, aged 26, was admitted to hospital with flaccid paralysis of the arms and legs following a strenuous day of physical training. When seen the paralysis had almost recovered, but he stated that he had had similar attacks since the age of 15, occurring at varying intervals, usually of a few weeks. All four limbs are paralysed during the attacks and often the muscles of the back as well. Speech is not affected, but occasionally swallowing is difficult. Severe exercise will bring on an attack the following day. He also states that a few glasses of beer will precipitate an attack. The paralysis lasts for three or four days as a rule, and some residual stiffness and aching persists in the affected muscles for about a week afterwards. He has warning of the onset in the form of a "tight feeling" in the arms, legs, and back. He feels very thirsty during an attack, but not hungry. No palpitation or dyspnoea has occurred, nor has there been any loss of sphincter control.

His mother is slightly affected, but with advancing years her attacks have practically disappeared. One brother (Case II) is affected. The accompanying family tree shows that seven members of the family are known to have been affected; these are shown in black.



A complete physical examination revealed no abnormality during a period of freedom from paralysis. There was no muscular wasting, and all the tendon jerks were brisk. The electrical reactions of all the muscles were normal. The administration of glucose in 50-gramme doses with 25 units of insulin three times a day did not induce paralysis, nor did the injection of adrenaline in 5-minim doses half-hourly for twelve hours.

On April 2, 1940, 200 grammes of glucose was given at 10 a.m. An attack of paralysis began about 1 a.m. the following day. Weakness was maximal in the upper arms, back, and legs. The forearms were only slightly weak and toe-wriggling movements could be performed. All the tendon jerks were absent with the exception of those of both triceps and the knees, which could just be elicited. The pulse-rate remained unchanged, the blood pressure was 130/75. There were no sensory changes apart from tenderness and aching of the muscles involved. Twelve grammes of potassium chloride was given by mouth at 10 a.m. on April 3. The paralysis had completely disappeared by noon, but some stiffness and aching remained. The tendon jerks all reappeared as the paralysis was passing off. The potassium chloride produced severe nausea, so it was decided to use potassium citrate on future occasions. A fractional test meal showed a normal secretion of free hydrochloric acid, and a glucose-tolerance curve was normal.

On April 17 another attack of paralysis was induced by giving a further 200 grammes of glucose at 10.30 a.m. As before, the onset of paralysis was about 1 a.m. the following day. The serum-potassium level at 10 a.m. on the 17th was 18.9 mg. per 100 c.cm. On this occasion all the tendon jerks disappeared, and the electrical reactions were present but sluggish in the affected muscles. Serum-potassium and blood-sugar estimations were made during the period of recovery and the following figures were obtained:

	Serum Potassium	Blood Sugar
April 18:		
10.30 a.m.	12 mg. per 100 c.cm.	110 mg. per 100 c.cm.
15 grammes of potassium citrate then given. Rapid recovery followed.		
11 a.m.	18 mg. per 100 c.cm.	
11.30 a.m.	21.8 " " " "	110 mg. per 100 c.cm.
12 noon	23.3 " " " "	
2 p.m.	20.1 " " " "	90 " " " "

The tendon jerks were present at 11 a.m. and had fully returned at 2 p.m.

The urinary excretion of potassium was estimated during the two days covering the period of paralysis and the following figures were obtained:

	Urinary Excretion of Potassium
April 17.	
Between 10 a.m. and midnight	0.19 gm.
April 18:	
Between midnight and 10.30 a.m.	0.172 gm.
" 10.30 a.m. and 2.30 p.m.	0.126 gm.
" 2.30 p.m. and 9.30 p.m.	2.964 gm.
" 9.30 p.m. and 5.30 a.m.	1.5 gm.

Case II

Private B, aged 23, the younger brother of Gunner A, stated that his first attack of paralysis occurred at the age of 17. The attacks are infrequent and by no means as severe as those of his brother. They are brought on by severe exercise, and he has had one attack since he joined the Army—following a long route march. As in Case I, the paralysis usually occurs when he is in bed at night, and when severe it lasts for two or three days. He has no premonitory signs or symptoms.

On April 26 physical examination revealed no abnormality. All attempts to induce an attack of paralysis failed. Glucose alone, glucose with insulin, and adrenaline did not cause the slightest muscular weakness. The following serum-potassium and blood-sugar estimations were made:

	Serum Potassium	Blood Sugar
April 29.		
1.30 p.m.	24 mg. per 100 c.cm.	116 mg. per 100 c.cm.
200 grammes of glucose then given by mouth		
2.45 p.m.	25.7 mg., but some haemolysis had occurred	
3.15 p.m.	21.9 mg. per 100 c.cm.	116 " " " "
4.15 p.m.	21.9 " " " "	116 " " " "
7.15 p.m.	19.35 " " " "	110 " " " "
11.30 p.m.	16.93 " " " "	
April 30:		
8.30 a.m.	21.9 " " " "	
2.15 p.m.	22.5 " " " "	

The investigation of this case was not pursued further.

Commentary

The low level of the serum-potassium content during the period of paralysis in Case I and the rapid recovery following the giving of potassium salts by mouth correspond with the observations of Aitken, Allott, Castleden, and Walker (1937) and Allott and McArdle (1938). The estimations of the urinary excretion of potassium, although incomplete, suggest that there was a retention of potassium in the body during the period of paralysis and its onset.

Ferrebee, Atchley, and Loeb (1938), and Pudenz, McIntosh, and McEachern (1938) showed that potassium is retained in the body during the attacks of paralysis. Gammon, Austin, Blithe, and Reid (1939) have shown that in the late hours of the night potassium excretion

was unusually low and that water diuresis rapidly washed out potassium from their patient, with a fall in the serum potassium and development of paralysis. Pudenz, McIntosh, and McEachern found that if the venous return of one arm was obstructed the injection of potassium chloride into an artery of the limb did not produce a return of function. If, however, the circulation of the limb was completely obstructed injection of potassium chloride into the other arm produced a return of function equally quickly in both limbs. They therefore suggested that a central factor may be at work. It has been shown that intravenous injection of choline esters such as doryl and mecholyl will cut short an attack of paralysis without the administration of potassium, and that after these drugs the serum potassium rises.

An interesting similarity to the action of potassium in familial periodic paralysis occurs in myasthenia gravis. Laurent and Walther (1935) first showed that potassium salts were a valuable adjuvant to prostigmin in the latter condition and might even replace it in some cases. Cumings (1939, 1940) has shown that there is a retention of potassium in the muscle substance during the periods of weakness in myasthenia gravis.

Our knowledge of the mechanisms involved in the causation of attacks of familial periodic paralysis is still very incomplete, but the available evidence suggests that an abnormal metabolic process in the muscle fibres is responsible, and not any central factor in the nervous system. Allott and McArdle (1938) found that the phosphorus metabolism runs parallel with that of potassium and suggest that a quantitative or qualitative disturbance of hexose phosphate metabolism is involved. The similarity to myasthenia gravis suggests that there may be common factors in the two conditions.

The serum potassium was estimated colorimetrically by a cobaltinitrite precipitation method. The same method was applied to the urine after making it alkaline and removing the ammonia by adding formaldehyde.

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Dr. John E. Gordon, Professor of Preventive Medicine and Epidemiology at Harvard University, has made a brief statement of his plans for setting up in this country the American Red Cross Harvard Hospital for Infectious Diseases. The plan envisages three distinct activities: (1) the hospital proper for the care of patients; (2) research laboratories for the study of clinical problems and epidemiology; (3) field study in epidemiology and infectious diseases. Dr. Paul V. Beeson, formerly of the Rockefeller Institute Hospital in New York, will be in charge of the hospital; Dr. MacNair Scott, Research Professor of Pediatrics at the University of Pennsylvania, will supervise the laboratory work; Dr. John Mote, Assistant in Epidemiology at Harvard Medical School, will undertake epidemiological investigations; and field studies will be under the direction of Dr. Dean Fleming of the Harvard School of Public Health.

SOME PUBLIC HEALTH CONSIDERATIONS CONSEQUENT UPON A LARGE-SCALE AIR RAID

BY

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The enemy air raid on Coventry on the night of November 14–15, 1940, was of great severity and the casualties were heavy. Damage to property in the city was widespread and included much injury to drainage, sewerage, and water communications. The social disturbance as affecting the lives and habits of the civil population was considerable, and, following the raid, evacuation—official and private—was on a large scale. This was due to the big number of damaged houses temporarily uninhabitable and to the hazard of further raids. In addition to the "complete" evacuees there was a larger number of those who continued to work in the city by day and to sleep elsewhere. The still commendably large residual adult population who "stuck it" in the city have had to take to shelter life to a greater extent than obtains in areas hitherto comparatively free from bombardment. All these things have brought momentous public health considerations in train, notably in the spheres of epidemiology, hospital policy, mental health, and housing. In these connexions the following brief notes may be of interest.

Epidemiological

In view of damage to drainage and water mains the typhoid hazard was obvious, and the preventive measures adopted included (*a*) persistent local propaganda urging the boiling of drinking-water and milk; (*b*) the chlorination of water supplies; (*c*) special injunctions to and supervision of makers and purveyors of foodstuffs in regard to cleanliness; (*d*) all possible steps to secure the early restoration of water-pipes, sewers, and drains; and (*e*) arrangements for large-scale anti-typhoid inoculation.

In regard to (*a*), Press, posters, and Ministry of Information loud-speaker vans were used. The absence of gas supplies in many parts of the city added difficulty to the boiling of water and milk, but the public nevertheless took the matter seriously and resorted to open fires for boiling.

Immunization against Typhoid.—The view of the Ministry of Health in regard to mass immunization against organisms of the typhoid group is that there is no occasion for it unless conditions should arise which, in the opinion of the medical officer of health, render it necessary. The conditions which arose in Coventry following the big raid were exactly such as presumably were meant when the latter proviso was inserted.

Immediately after the raid three immunization clinics were opened at convenient points in the city—namely, at two hospitals and at a large central first-aid post. In addition one of the mobile first-aid units was commissioned temporarily as a mobile immunization clinic. These clinics were conducted by medical and nursing personnel of the public health department. Arrangements were made for the employees of large factories to be inoculated at the factories. The immunizing material was supplied free by the department, and the firms concerned contracted with private medical practitioners for the inoculation work. The campaign was well advertised by Press, posters, and loud-speaker vans. The immunizing material

used was Lister Institute anti-typhoid-paratyphoid A, B, and C vaccine, supplied through the Ministry of Health. In addition a certain amount of Evans Sons Lescher and Webb's anti-typhoid-paratyphoid A and B vaccine was employed. The injections were made subcutaneously in the left upper arm. During the first three weeks following the raid the numbers of persons immunized were: At the clinics, 2,364; in the factories, 13,417; privately, 505. The work is still proceeding apace, although the law of diminishing returns is beginning to assert itself. Notably in regard to workers in factories, there was some little apprehension at first regarding the possibility of loss of working time owing to reactions. The inoculations were done at times which minimized this possibility, and in fact initial misgivings proved to be unwarranted.

Shelter Dangers.—Much has already been written in regard to the unhappy epidemiological potentialities of shelter life. The danger applies fully in a proven target area where, since raids began, shelter life is regular and general. In such an area the risk of an unusual incidence of diphtheria, cerebrospinal fever, influenza, and the like is real. Measures of prevention in the shelters may be classified as environmental, supervisory, and educative. The best general measure is a strong evacuation policy applied to women and children. So far as diphtheria is concerned mass immunization of children is in any case important and necessary. The open phthisis case is a constant problem in public shelters, and the medical or nursing adviser should essay to secure that infectious cases of this kind refrain from using the shelters. Dispersal in small shelters as opposed to concentration in large ones would do much to counter the spread of infections, but, of course, many other important considerations must influence shelter policy.

Baths.—The Coventry raid seriously interfered with supplies of water to the public baths, and the bathrooms of a large number of damaged houses were of course unusable—just at a time when bathing facilities were especially necessary to help to counter possible infections and parasitic conditions. Water-supplies were quickly restored to the undamaged first-aid posts, however, and the shower-baths in the decontamination units there were made available to the public and were much used. Requests were made to the factories possessing similar facilities to throw them open to workers and their families, and a good response was forthcoming. The local policy of providing rain-water tanks in connexion with house property proved its value, for in many homes where the town's water was cut off rain-water was still available for washing purposes.

Hospital Policy

If further evidence were needed in favour of peripheral as opposed to central sites for hospitals connected with large towns air-raid conditions have supplied it. In Coventry the two large general hospitals are situated centrally, and both sustained damage in the big raid. Owing to the extensive damage the number of beds has been so reduced that each hospital constitutes only a casualty clearing station together with a pool of beds for the temporary accommodation of ordinary acute cases pending evacuation as the pool fills up. The scheme of affiliated outer base hospitals, as planned for the region by the Ministry of Health, has proved invaluable, and the evacuation and other arrangements have worked smoothly under test. It was fortunate that the central hospitals in Coventry had been largely evacuated in readiness before the big raid came. The provision of peripheral in place of central casualty clearing stations may well be a future requirement.

At present the committee of the city's large voluntary hospital is concerned about the future of the hospital, which sustained very extensive damage. All are agreed that full restoration on the existing central site is contra-indicated so long as air-raid risks continue. On the other hand, are the large and excellent administrative and clinical resources of the hospital to be employed only in the restricted sphere of an institution with less than a half of its former beds? The solution is likely to be found in two ways—namely, (*a*) by employing certain resources in the general hospital services of the region, and (*b*) by taking over some large block of buildings in an outside area and staffing and equipping it as a branch of the central parent hospital.

Mental Health

During and shortly after the raid many cases of mental distress found their way to the first-aid posts, for rest and sympathy. They can best be described as having been "stunned" by events. In the main their condition soon became normal. On the whole the reaction of the population was one of calm defiance. Doubtless there was a proportion of neurotic subjects, notably among the hasty evacuees. Actually there has been a decrease in the numbers of patients attending the psychological out-patient clinics held twice weekly in the city. This is probably due to (*a*) the decrease in the city population due to evacuation, and (*b*) the likelihood that the clinic patients—actual or potential—were among the first to evacuate. Nevertheless it cannot be said that there is evidence of any notable increase in the incidence of neurosis. Coventry has suffered many previous raids, and it may be that these served to eliminate the more nervous people by evacuation prior to the big raid.

Housing and Feeding

The number of persons homeless owing to the raid was very considerable. These were immediately provided for through the city's emergency rest and food centres, pending more permanent housing arrangements in outside billets and hostels or with relatives and friends. In the latter connexion travel vouchers were issued to a large number to enable them to reach the homes of those willing to accommodate them in other areas.

The damage to houses was in some cases heavy in areas which in normal times would be the subject of slum-clearance measures. In this respect the raid will have some salutary repercussions. It has in fact given to Coventry a unique opportunity for future big-scale replanning on healthy lines, and there is every reason to believe that the opportunity will not be lost. Meanwhile first-aid repair to houses which properly admit of it is in full progress. In connexion with reconstruction works, hostels have been and are being provided for imported workers.

Even at the height of the city's difficulties there was no serious shortage of food, which was brought in under efficient Government arrangements and dispensed through the city's many feeding centres. The situation was assisted by mobile canteens operated by various voluntary organizations. For some days normal milk supplies were held up, and local stocks of dried milk were of particular value. After the raid an important task was that of food salvaging from damaged shops, stores, and hotels. This was collected and sorted by competent inspectors into the three categories—(*a*) fit for human food; (*b*) fit for animal food only; and (*c*) unfit for any use—and was disposed of accordingly. A common cause under category (*c*) was contamination with small particles of broken glass.

At the time of writing (December 16) services have been largely restored, and among the population stabilizing forces are in full evidence. As their houses are repaired the occupants are returning. There has been no outbreak of infectious disease up to date.

INOCULATION WITH T.A.B.C. VACCINE IN SOUTHAMPTON

ANALYSIS OF REACTIONS

BY

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In September, 1940, we initiated in Southampton a campaign to protect the civilian population against the typhoid group of fevers. The response of the public has been encouraging, particularly among the employees of the larger commercial firms, in some of which we have achieved as high an acceptance rate as 80%. It is interesting to note that, although on occasions the local and constitutional reactions caused discomfort, the number of persons who did not return for a second injection was under 1%.

Some local authorities have refrained from carrying out mass inoculations owing to the possible loss of working time among the manual workers in essential war production. An editorial in the *Medical Officer* discredited such a scheme, on the assumption that every person receiving inoculation would be incapacitated for forty-eight hours, and considered that the resultant loss of working days would far outweigh the time lost through the disease. This conclusion was based on the incidence of the disease in peacetime. For this reason I have noted with care the reactions and loss of working time among those who have received the inoculations. Unfortunately it has not been possible to ascertain to the same degree the reactions following the second injection, but from a large number of people who have been interrogated we find that these show little difference.

The Lister Institute T.A.B.C. vaccine was used in the following doses, with fourteen days' interval between the first and second injections: men, 0.5 c.cm. and 1 c.cm.; women, 0.3 c.cm. and 0.6 c.cm. In analysing the reactions males and females have been divided into manual and sedentary workers, and the reactions classified as follows:

1. Slight local reaction—stiffness of the arm with local redness for a period lasting up to forty-eight hours.

2. Severe local reaction—pain and stiffness exceeding forty-eight hours, with redness and swelling extending more than two inches from the site of injection.

3. General reaction. This took several forms, the most common being a feeling of malaise, nausea, giddiness, shivers, and 'flu; it included in a few cases abdominal pain, with diarrhoea, vomiting, and occasional erythematous or urticarial rashes, the last-named being more marked in allergic subjects.

4. Combined reactions: one of the local reactions with a general reaction.

5. No reaction.

Many of the larger firms desired to have their employees split into groups, owing to the possible dislocation of work by incapacitation, but it is shown that among the 10,032 persons investigated the total loss amounted to only thirty days, and no working time was lost by a total of 1,872 male manual workers. Children over 3 years of age receiving the appropriate dose did not show any severe reactions, and in many cases protection against diphtheria was given at the same time without any bad result. It was also noted that those who had severe general reactions usually had mild local reactions.

Analysis of Reactions following the First Injection

Reactions	Females		Males		Total
	Sedentary Workers	Manual Workers	Sedentary Workers	Manual Workers	
Slight local	1,707 (61.45%)	1,766 (67.8%)	1,592 (57.2%)	1,188 (63.4%)	6,253
Severe local ..	50 (1.85%)	70 (2.6%)	38 (1.3%)	50 (2.7%)	208
Combined reaction ..	766 (27.6%)	594 (23%)	992 (35.7%)	508 (27.2%)	2,860
No reaction	253 (9.1%)	172 (6.6%)	160 (5.8%)	126 (6.7%)	711
Number inoculated	2,776	2,602	2,782	1,872	10,032
No. of working days lost	8	7	15	—	30

Before the heavy raids on Southampton between 3,000 and 4,000 persons attended for inoculation each week, but the interruption of the clinic services occasioned by these raids upset the routine, and we are now making use of the mobile first-aid units. These are stationed in different parts of the town every afternoon, and the number of persons attending shows a daily increase. It is of great importance that if large numbers of persons are to be protected in a town a medical officer should be sent to the places of employment, as workers find it difficult to attend public clinics before the early black-out.

Clinical Memoranda

Congenital Obliteration of Bile Ducts with Total Transposition of Viscera

I have failed to trace any references to congenital atresia of the bile ducts occurring in association with complete transposition of the viscera, hence my desire to record the following case. I have found reports of cases in which congenital obliteration of the bile ducts has been described in association with the transposition of some of the viscera, but in none of them does the transposition seem to have been total.

CASE REPORT

A full-term female child—weight 7¼ lb. at birth—was admitted when 6 months old to the Devon and Exeter Hospital bearing the label "icterus neonatorum." The history was that she had been "yellow" since birth. This "yellowness" had steadily increased in intensity, and about six weeks previous to admission the abdomen had gradually become swollen, followed by swelling of the legs and feet; otherwise, according to the parents, the child had been healthy and normal in every way. She was the second of the family, the elder child being perfectly healthy. The father and mother were both healthy and normal. No instance could be elicited of a similar condition in the family history.

On admission the temperature was 99.2°, the pulse 120, and the respirations 48. The infant was well nourished, somewhat anaemic, had marked distension of abdomen, with a moderately intense icterus which involved the whole body, including the conjunctivae. I was unable in my interrogation of the parents to find out whether the jaundice had first appeared in the skin or in the conjunctivae. Both legs were

oedematous and swollen, and there was a haemorrhagic area in the skin on the antero-lateral aspect of the right wrist. The buttocks and labiae were swollen, excoriated, and red. On palpation both liver and spleen seemed to be enlarged. The presence of intraperitoneal fluid was demonstrable.

There was no apex beat visible or palpable on the left side. On auscultation it was discovered that the usual heart sounds heard over the mitral area could be heard much better over a corresponding area on the right side. This led to palpation on the right side, and a faintly palpable beat could be found in the region of fourth and fifth ribs. Dextrocardia was postulated and confirmed at necropsy. There was some dullness in both lung bases, otherwise nothing abnormal was detected in the respiratory system. No evidence of haemorrhage from the umbilical cord was seen nor had the parents noticed any. Stools were, in jaundice parlance, "putty-like." The urine was deeply stained and there was no epistaxis.

A blood examination showed: red cells, 4,240,000 per c.mm.; haemoglobin, 76%; colour index, 0.9; white cells, 62,400 per c.mm.—polymorphonuclears, 61.5%; lymphocytes, 37%; transitional neutrophils, 1%; eosinophils, 0.5%. There was anisocytosis of the red blood cells—some of which were polychromatic—and occasional punctate basophilia. Seven nucleated red blood cells (normoblasts) were seen while counting 200 white blood cells.

The child lived for two days after admission, then died; the temperature having previously risen to 103°.

Post-mortem Examination.—Apart from some congestion, no cerebral abnormality was found. On opening the thorax *complete transposition of the heart and lungs* was observed. Transposition was also found in the abdomen, including the kidneys (as judged by the shape of the suprarenal glands). The heart and lungs showed no other abnormality. There was *half a pint of blood-stained fluid in both pleural sacs*, and about a pint of straw-coloured fluid in the abdomen. The liver was markedly enlarged, hard, tough, and greenish in colour (obstructive biliary cirrhosis). In the position of the gall-bladder there was a thin-walled cyst containing clear greenish-yellow fluid; this, I think, was the gall-bladder—it was about the size of a tangerine. What appeared to be the cystic duct was a fibrous cord lying between the cyst and the liver; it had no connexion with the cyst. The common bile duct could not be traced. The spleen presented a curious condition: there were no fewer than twenty-two splenunculi.

I would like to thank Dr. Seward, honorary assistant physician to this hospital, for permission to report the case, and Dr. Robb, pathologist, for his help and encouragement.

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A Note on the Gastro-Ileac Reflex

An increase in the activity of the colon after the taking of food is a physiological process which is an everyday experience. It is not so well known that a similar reaction occurs in the lower ileum. The term "gastro-ileac reflex" was given to the phenomenon by Sir Arthur Hurst in 1913, although Sir William Macewen described it in 1904.

Observations by Douglas and Mann (1939, 1940) in the dog seemed to indicate that the reaction was not confined to the ileum but occurred also in the jejunum, and, furthermore, depended for its mediation not on the extrinsic nerves of the intestine but on the continuity of the lumen of the intestine. Through the kindness of Prof. Grey Turner I have had the opportunity of studying the reaction in a patient in whom a caecostomy had been established as a preliminary to resection of a colonic carcinoma.

So far as I am aware no record of the reflex has been taken in man. Accordingly a simple air-displacement system was devised, consisting of a small balloon cemented to a gum-elastic catheter, a water manometer, and a recording tambour with a writing lever. The system was connected by pressure tubing. The record was taken on a slow kymograph. The balloon was inserted through the ileo-caecal valve into the ileum for a distance of about nine inches. It was held in position by the patient, the semi-rigidity of the catheter preventing its expulsion. Food was withheld for four hours. The balloon was inflated to a water pressure of about 6 cm., and a control tracing taken. A meal was then given, the tracing being continued.

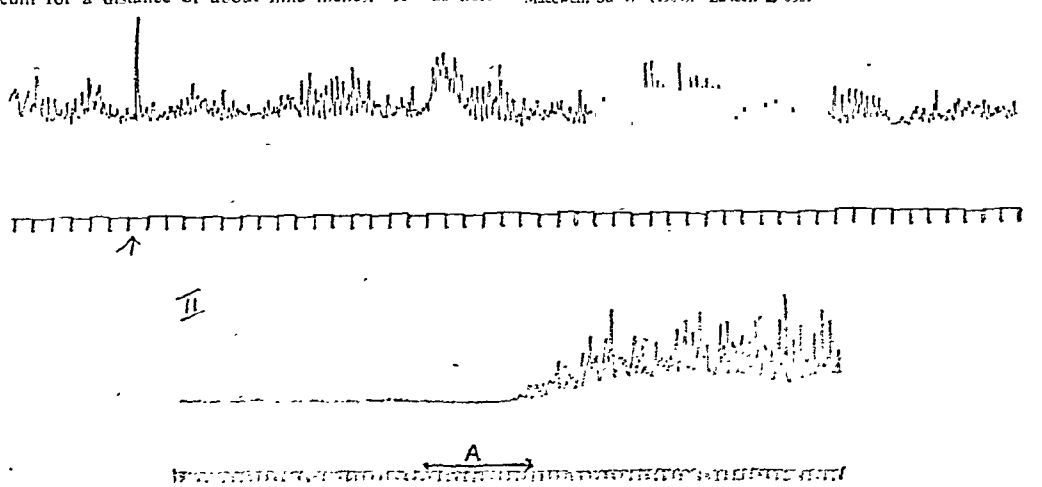
In the patient, as in the dog, the taking of food was rapidly followed by a well-marked increase in activity (see Figure). At the same time the small-bowel contents were expelled past the balloon into the caecum. It is of interest to note that the time relation of the reaction is similar to that in the dog. The function of the response is probably excretory. The gastro-colic reflex is often followed by defaecation, and it is probable that the gastro-ileac reflex represents defaecation of *the small bowel into the colon.*

Acknowledgment is made to Dr. Allen Daley, Chief Medical Officer to the L.C.C., for permission to publish this observation.

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The gastro-ileac reflex in man (upper tracing) and dog (lower tracing). The time intervals in the human tracing are 30 seconds, in the dog 5 seconds. The large excursion in the human tracing immediately after the feeding signal is an artefact caused by the patient's moving while eating.

Reviews

MALIGNANT DISEASE

Malignant Disease and its Treatment by Radium. By Stanford Cade, F.R.C.S. (Pp. 1,280; with 623 illustrations, many in colour. 75s. net.) Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall, Ltd. 1940.

This book fills a long-felt want and is assured of a hearty welcome. Any one man might well shrink from the attempt to draw the picture of cancer as a whole, for the subject demands at the very least full knowledge of the pathology and natural history of cancer, the wisdom of the experienced general surgeon, and a detailed understanding of the physics and biophysics of radiant energy. Everyone concerned in the treatment of cancer will be under a great debt to Mr. Stanford Cade for succeeding in so immense an undertaking.

The first part of the book contains in a hundred pages a full, accurate, and readable account of radio-activity and radium dosimetry. H. T. Flint, C. W. Wilson, and L. H. Gray have contributed chapters which will enable the clinician to understand the physical principles governing the use of radium, and so, in full co-operation with the physicist, be so much better equipped to treat the patient with cancer.

In the second part of nearly 200 pages the biological effects of radiation are presented in clear and connected detail, and the wealth of references is never allowed to interfere with the continuity and the clinical significance of the facts described. Where all is so good the account of the much-neglected radium burn is outstanding: "It is neither inevitable nor is it of any therapeutic value. It denotes as a rule errors of technique or errors of judgment." The quotation well illustrates the author's vigorous and easy style, which makes the reading of the book as pleasurable as it is profitable.

The third part starts with a succinct account of the limitations of surgery and of the value of radiotherapy, and the author pays his tribute to the pioneer work of the Paris Radium Institute, the Stockholm Radiumhemmet, and the New York Memorial Hospital. If the soundness of their principles had been earlier recognized in England the years spent in using radium for clinical research in general hospitals by methods of trial and error might well have been avoided.

Malignant disease is then considered in every site of the body, a chapter to each: its natural history, clinical types, symptoms (with particular emphasis on the early symptoms as distinct from the textbook descriptions of established disease), histology, local and distant metastases, course, and termination. Next the diagnosis and differential diagnosis are discussed, and then the choice of the method or methods of treatment. The emphasis is always on the value of combined methods of treatment—surgery, surgical diathermy, *x* rays, and the various kinds of radium treatment; the right sequence as shown by experience is indicated, and the technique of radium treatment is given in detail, with illustrative case histories and physical measurements of dosage. The causes of failure are discussed, and the five-year results of the author's cases are set out together with statistics from other cancer centres. Operative details are not as a rule given, but the author lays stress on such points as he has found of importance, such as the removal of the posterior belly of the digastric in a block dissection of the neck. In this connexion, incidentally, he brings the weight of his experience against the so-called prophylactic irradiation of the neck, the value of which is questioned by many radiotherapists.

The value of a book written by one man over that compiled by many specialists is particularly well seen in the chapter on the breast: having, as Mr. Cade says, confused his own mind by the voluminous literature, he comes to clear and fundamental conclusions from the study of his own cases, and the indications for the various methods of treatment are set out with such logic as must command general acceptance. There are naturally many examples in radiotherapy where opinions will differ, and not everyone will support the author's preference for the interstitial treatment of rodent ulcer to surface application; but the case is always fairly presented, and adequate references are given so that the reader may judge for himself. The chapter on cancer of the lung is written by C. Price Thomas, and those on the oesophagus, stomach, and rectum by E. Stanley Lee; these sites are the Cinderellas of radiotherapy, but the reasons for failure and the lines along which advance may be possible are adequately discussed.

With over 600 illustrations, most of them original and many in colour, and a liberal use of charts and tables, the book is an outstanding contribution to radium therapy and a worthy tribute to the Westminster and Mount Vernon Hospital Centres. It summarizes the work of the past twenty years, and will, it is to be hoped, influence the treatment of cancer for another twenty years to come.

MOSQUITO CONTROL

Mosquito Control: Practical Methods for Abatement of Disease Vectors and Pests. By William Brodbeck Herms, Sc.D., and Harold Farnsworth Gray, Gr.P.H. (Pp. 317. $3.50, or 20s. net.) New York: The Commonwealth Fund; London: Oxford University Press. 1940.

In this handsome and attractive volume, illustrated with some excellent photographs and containing useful up-to-date bibliographies to each section, the authors deal very thoroughly with the subject of mosquito control. In reviewing such a work it is perhaps as well to note that there are two distinct aspects or settings to which the term "mosquito control" applies. Mosquito control may form part of operations directed against malaria. There is also, however, the important subject of mosquito control directed against mosquitos themselves as a serious sanitary or even economic problem. This latter form of operation has been greatly developed in America, and in regard more especially to the vast numbers of mosquitos that breed in the salt swamps characteristic of some parts of the coast. Here abatement of the mosquito nuisance is so essential to the carrying on of the normal economic life of the community that it has led to operations on a very large scale, involving great expense and demanding special engineering and administrative experience. Though not entirely restricted to the latter type of operation the volume under review is primarily so concerned. Thus it is possible that the worker on anti-malaria operations, if not warned, might feel some disappointment in that in the many details now developed in the technique relating to anti-malarial measures in tropical countries he scarcely finds what he might feel to be adequate treatment. Nevertheless the book is so thorough in dealing with certain subjects—for example, the principle underlying questions of oils and larvicides, the value of different mosquito ordinances in their actual practical outcome, and many other matters—that even to the worker in the field of malaria control it should be of great value.

On the whole one gathers a most striking impression of the mechanization which has been developed in this setting—the use of the centrifugal pump and mechanical excavators, the dusting of Paris green by aeroplane and by power-operated blower, the power spraying of oil, the motor-cycle oiler and tractor-drawn tracklayer-type oiling

equipment, and other applications of modern developments to facilitate operations. Even if these mechanical applications do not seem to be always very suitable for much of the work which the malariologist has to cope with in the Tropics, such a book as the present one is a stimulus to progress and a reminder to what extent in the modern world mechanization is everywhere coming into the picture.

METHODS OF THERAPY

The Therapeutics of Internal Diseases Volume I: *General Therapeutics, General Therapeutic Technic.* Volume II: *Drugs, Toxicology, Infectious Diseases.* Edited by George Blumer. (Volume I, pp. 872; Volume II, pp. 1,042. Complete in four volumes, cloth, £9 the set.) New York and London: D. Appleton-Century Company.

The first two volumes of this work, edited by Dr. G. Blumer, contain articles by about sixty contributors, the majority of whom are university teachers either of clinical or of laboratory subjects. As regards the general arrangement the text is based upon the description of methods of therapy. About half the first volume is occupied with physical methods, and most of the remainder with endocrine, serum, vaccine, and bacteriophage therapy. The first half of the second volume contains two long articles on pharmacology and toxicology by Prof. Louis Goldman, and the rest of that volume deals with the therapy of infectious diseases. The volumes provide a very useful work of reference regarding modern therapeutic methods. Indeed, the two articles by Prof. Goldman constitute medium-length textbooks.

The compilation of a satisfactory textbook of therapeutics is notoriously a matter of difficulty, since it is necessary to base the general arrangement either on the treatment of patients or on the forms of treatment available for diseases. The latter method has here been adopted, and modern procedures are described very fully, but as a result the work provides no systematic account of the treatment of many common conditions, such, for example, as chronic heart disease and chronic nephritis. This is reflected in the index, which contains one and a half columns under "digitalis," but a mere dozen or so references under "cardiac." Similarly, there are but three references concerning cough, and the only systematic account of its alleviation comprises two pages in the section on chronic pulmonary tuberculosis. These examples indicate the limitations imposed by the arrangement adopted. These limitations certainly must reduce the value of the volumes so far as the general practitioner is concerned. The large number of contributors necessarily involves some lack of balance as regards the amount of space devoted to different subjects. Every subject, however, is treated by a specialist; hence the information provided is of a high standard of accuracy.

The attention given to methods of physical therapy deserves special notice because these are new and of increasing importance; it is not easy to find systematic accounts of their value as full as those provided in these volumes.

THE FOOT AND ANKLE

The Foot and Ankle: Their Injuries, Diseases, Deformities and Disabilities. By Philip Lewin, M.D., F.A.C.S. (Pp. 620; 303 illustrations. 42s. net.) London: Henry Kimpton. 1940.

Already this year two new books devoted exclusively to the foot and published in the United States have been reviewed in these columns; now comes a third, written by Dr. Philip Lewin of Chicago, with the title *The Foot and Ankle.* It is rather larger than its forerunners, and within its 600 pages covers the whole subject very adequately. The production within a year of three books on the same subject would seem to show that the public and the profession are rapidly becoming foot-conscious, no less in the States than in this country. Dr. Dudley Morton's popular book, *Oh Doctor! My Feet!* is an even more certain indication of the interest which the American public now displays in the subject. Although there is no parallel to the latter publication in this country, it may be noted that we set the fashion in books on the foot with those by Ellis and by Walsham and Kent Hughes (now, unfortunately, both out of print) in the last century, and more recently with Lake's *The Foot.*

It is all to the good that interest, both professional and public, in the feet should be renewed, for undoubtedly a large amount of discomfort, inefficiency, and disability arises from foot troubles often in themselves comparatively insignificant.

The book now under review is a notable contribution to the subject in which every aspect is dealt with in considerable detail. The inclusion of the ankle with the foot is logical, and we note that the author very properly also includes such lesions as varicose veins and rickets of the leg. A little more attention might well have been given to the evolution of the foot, for, as previous writers have pointed out, therein lies the primary cause of many foot troubles. However, in a book which is essentially practical and already fairly bulky, it is arguable that such theoretical considerations must give way to matters of direct clinical application. Space will not allow a critical notice of each chapter, but we may take that on flat-foot as a sample. The impression gained here is that the author is somewhat vague as to the exact nature of this condition, and in consequence we find a long list of possible causes. The question "Is the failure primarily muscular or ligamentous?" remains unanswered, and so the indications for treatment are correspondingly indefinite. Such an agnostic attitude is probably justified by our lack of knowledge and agreement upon the many anatomical and physiological features involved, but we feel that the pros and cons of the subject should at least be submitted for the reader's judgment. It will appear rather unusual to the English reader to find so many pages devoted to the treatment of flat-foot by open operation, a procedure very rarely adopted here.

In general this book is an admirable exposition of the subject, well illustrated and well produced. We would end by quoting a wise sentence from the paragraph on "The Mental Attitude of the Patient": "The present success and popularity of quackery and charlatanism should impress upon physicians the importance of treating the mind and the emotions of the patient as well as his physical troubles.

Notes on Books

The treatment of squint in an effective manner might very well be taken as a measure of the grade of the civilization of a people. That was a thought which was impressed upon the mind of the writer when visiting a mid-European country a few years ago. There he saw many children with squints for which it was evident no treatment had been attempted. In this country, happily for the children, parents have learned that a girl with a squint has her prettiness spoiled and that a boy with a cross-eye will be rejected for many a good job. *The treatment of squint may be grouped into three sections:* (1) examination to determine the primary cause and the correction of any error of focus with glasses; (2) special exercises to revive the function of binocular vision; (3) operation in some cases. Section 3 demands much care, skill, and time to carry through the training. Orthoptics is no new line of treatment,

It was first attempted by Erasmus Darwin in 1778; it is likely that the modern development of the art would have intrigued him greatly. To the staff of the Royal Westminster Ophthalmic Hospital we are indebted for the example they have set in the organization of this work. *Practical Orthoptics in the Treatment of Squint*, by Mr. KEITH LYLE and Miss SYLVIA JACKSON, now in its second edition (H. K. Lewis and Co., Ltd., 15s. net), gives a full and valuable account of this treatment and the measure of success that has been obtained by it. This book will be of value to every ophthalmic surgeon, and is a necessary manual for every orthoptist working under the direction of the ophthalmologist.

They Wanted Adventure (Jonathan Cape, 7s. 6d. net) is an essay in fiction by KENNETH MACFARLANE, a pseudonym hiding the identity of the medical author of a most original autobiography. It is a story about two children, a brother and sister, who during a holiday on the west coast of Scotland found themselves taking a leading part in a series of surprisingly exciting events, ranging from the shipwreck of a fishing boat to the discovery of foreign spies in an uninhabited island. For those who are fond of sailing, children, or Scotland this should prove an acceptable book.

Miss EVELYN PEARCE'S *General Textbook of Nursing* (Faber and Faber, 15s. net), promptly recognized on its first appearance in 1937 as one of the best and most comprehensive guides for students and qualified nurses, continues to appear in new guise despite the present conditions. For the fourth edition, now issued, special sections on the treatment of gas casualties and emergency blood transfusion give it topical value, and there are sixty new illustrations, including one of the B.L.B. oxygen apparatus.

Preparations and Appliances

AN IMPROVED STRETCHER CLIP

Dr. J. T. CHALMERS KEDDIE writes:

Much difficulty has been experienced in satisfactorily securing stretchers in ambulances, particularly when carrying out exercises in darkness. The webbing equipment attached to the stretcher-carrying fitments as supplied in accordance with the Ministry of Health Circular 1794 has been found to require a great amount of time to thread through the patent buckles, especially under black-out conditions. A person wearing anti-gas gloves finds the task impossible. Owing to these difficulties personnel are apt to neglect securing the stretchers, and as the Ministry requires these to be greased with vaseline there has been a great tendency for a stretcher to slide on its carriage when the ambulance is in motion, with the result that patient and stretcher are apt to be ejected into the road.

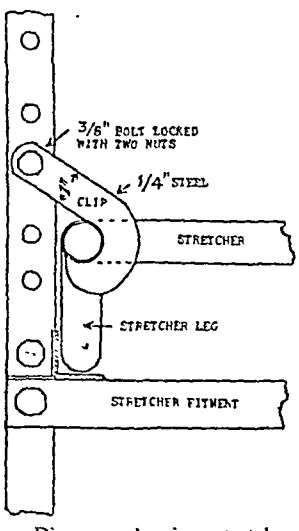


Diagram showing stretcher clip. This fits tight to the stretcher and lifts it 1/8 in. off the carriage; any weight applied on the stretcher binds it firmly to the fitment.

With the above points in mind something simple and cheap had to be designed, and the appended sketch shows a catch which serves the purpose in every way, and also provides for easy and efficient decontamination. If the catch is painted white it is easily seen in the darkness. These clips have been supplied to auxiliary ambulances in use and on "on call" and have proved most efficient.

A NEW HERNIA INSTRUMENT

Dr. HERBERT A. HAXTON (Lecturer in Anatomy, St. Andrews University) writes:

In these present days, when the operation of radical cure of indirect inguinal hernia is being performed on so many of the young men of this country, there is a place for any addition which will make the operation easier to perform and sounder in its end-result. It is with these objects in view that the instrument described below has been evolved. It consists of a body, with a head at one end and a point at the other (Fig. 1). The head is in the form of a broad retractor,

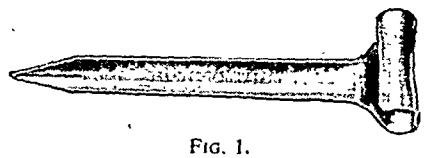


FIG. 1.

one and a half inches across and slightly curved from side to side; the blade of the retractor is curved through three-quarters of a circle. The body is four inches long and half an inch across, and it has a side-to-side curve. It tapers to a rounded point at the end remote from the head, and on this tapered part is a director groove.

This instrument has a threefold use—as a director, as a retractor, and as a depressor. The director is employed in the division of the constricting band of a strangulated hernia, the tapering part of the body protecting the viscus from damage during this manœuvre. The use of the instrument as a retractor is seen in Fig. 2, its purpose being to retract and

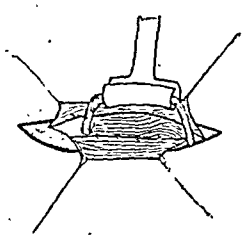


FIG. 2.

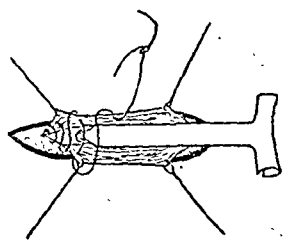


FIG. 3.

protect the spermatic cord during the procedure of suturing the internal oblique muscle and conjoint tendon to the inguinal ligament behind the cord, the essential step of Bassini's herniorrhaphy, which is the operation usually performed for the indirect hernia of the young adult. Since the blade is equal in transverse measurement to the length of the inguinal canal a full retraction of the spermatic cord is possible, so that the suturing can proceed unhampered by its presence. Other devices have been used for this step, such as a strip of gauze or a retracting ring; but these do not give the same complete retraction of the cord, combined with its protection during the introduction of the sutures.

The next step in the operation—the suture of the external oblique aponeurosis superficial to the spermatic cord—is aided by the use of the body of the instrument as a depressor and protector for the cord, as shown in Fig. 3. The procedure is to insert the pointed end in the opening in the internal oblique through which the cord passes, so that the body lies on the superficial aspect of the cord with its concave surface in contact with the latter. (The depth to which the point can be passed into the opening can be used to determine if it is too large, or so small that the veins of the cord will be constricted.) During suture of the external oblique the instrument is maintained in this position, protecting the cord from inclusion in the suture and preventing the soft fat which it contains from insinuating itself between the apposed edges of the aponeurosis, an event which results in weakening of the scar. The instrument is withdrawn on completion of the suture line, and again it acts as a guide for size, this time of the superficial inguinal ring.

The instrument has been made for me by Messrs. Allen and Hanburys, Ltd., to whom acknowledgment is due for their co-operation and for the illustration of the instrument.

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BLAST INJURIES

While we are lamenting the loss of our historic monuments it is well to take courage from the toughness of fibre of the human frame. Imagination, fed to some extent by tales spreading from theatres of recent wars, such as Spain, had endowed modern methods of war with far greater destructive power than our experience has shown them to have. Propaganda had played its subtle part in leading everyone, the medical profession included, into believing that modern high explosives had peculiar malignity. It is therefore well that the profession should have opportunity to take stock, sift evidence, and establish the truth as it sees it to-day. A discussion at the Royal Society of Medicine, reported in this week's issue, throws light on some of these beliefs, nursed early in the folds of ignorance, and disposes of much of the supposed malevolence of high explosives. Further clarification comes from the articles in our present issue by Professors Hadfield and Christie (p. 77) and Dr. Joan Ross (p. 79).

During the war of 1914–18 it was no uncommon occurrence to be exposed to and yet live through explosions at close quarters of shells of large calibre. Yet no clear clinical syndrome among soldiers subjected to such an experience emerged, and this might be thought to indicate an absence of injuries as a result of explosive forces alone. The prevailing thought was that the nervous system was particularly sensitive to this form of trauma—a thought which received the support of Mott. However, animal experimentation has established that pulmonary lesions predominate. Recently Sir Joseph Barcroft[1] undertook an investigation into the physiological effects of "blast." These experiments were so arranged that animals (goats) situated in the open and in Anderson shelters were exposed to the intense pressure changes, both of a positive and of a negative character, which are the essential elements of an explosion, following the detonation of a 500-lb. bomb. Measures were adopted to ensure the avoidance of injury by splinters. Four points were established from these experiments: first, that only animals placed in the open and at fifteen feet from the bomb suffered ill effects; secondly, that the Anderson shelters gave immunity at fifteen feet and outwards to "blast" injuries; thirdly, that the animals situated further than fifteen feet suffered no demonstrable lesion of their organs; and, fourthly, that the lesions found in the animals closest to the explosion were essentially in the lungs. Histologically[2] these lesions consisted of bruising of the surface of the lung in the line of the ribs and vertebral borders, and extended for one-quarter to half an inch into the tissue of the lung. Further small haemorrhages were found deep, mainly around the smaller bronchi. From a study of animals kept over a period of some weeks the exposure to "blast" appeared to have had no permanent ill effect. Professor Zuckerman,[3] in a more elaborate investigation designed to determine the mechanism by which the lung lesions were produced, confirmed the maximum insult to the lung tissue in a wide variety of animal species. He further obtained evidence that the lung lesions were the result of the impingement of the positive wave of pressure on the chest wall without bruising the chest wall itself. That lesions could occur elsewhere he was also able to establish, but that if these occurred the damage to the lungs was of such a massive character that the animals were dead. Of comfort to man, it was observed that such lesions were only to be found when the animal was in very close approximation to the explosive—a matter of a few feet—and this was explicable by the physical characters of the wave of pressure, which very rapidly decreased in intensity and consequently in lethal quality as it spread out radially. Two of his observations were of considerable importance in the diagnostic field —the presence of bloody sputum and the characteristic *x*-ray appearance of the chest. In view of such experimental data Professor Zuckerman, at the discussion at the Royal Society of Medicine, wisely stressed the necessity for using the greatest caution in labelling any given condition occurring in man exposed to air raids as resulting from "blast."

Four possible types of injury following a bomb explosion were propounded by Professor Zuckerman: (1) the lesions following the direct effect of "blast" and from the bomb-case splinters; (2) trauma resulting from the subject's being thrown to the ground or against a solid structure by the "blast" wave; (3) injury by secondary missiles, such as wooden beams, masonry, and such-like; (4) injury from exposure to fire or to escaping gas. Were the medical profession to keep such possible causative factors in mind and label accordingly much unwise discussion would be prevented and possibly much needless suffering, both physical and psychological, stopped. Difficulties, however, confront the medical man, for the main factor in determining the causative agent is the obtaining of a very clear history of the incident—an ideal which is not always possible to attain owing to the condition of the injured. Some evidence may be obtained from an estimation of the damage caused by the bomb; but on this aspect the profession awaits help from the appropriate authorities, who could issue, without disclosing information to the enemy, some data regarding the extent of damage from bombs of different calibre and an estimation of the zone of probable lethal "blast" injuries. This would act as a corrective to the natural tendency of all to magnify the size of the bomb and the nearness of themselves to it. With this knowledge the profession would be better armed to deal in a speedy and reliable way with air-raid injuries. There are now, however, available in the literature records of cases suffering from the effects of exposure to high explosives. Dean[4] and his colleagues observed in quite a number of cases symptoms and signs of

[1] Sectional Steel Shelters. Report upon Investigations of the Standard of Protection afforded. H.M. Stationery Office. 1939.
[2] Unpublished work of Sir Joseph Barcroft. 1939.
[3] *Lancet*, 1940, 2, 219. See also Falla, Stephen T., *British Medical Journal*, 1940, 2, 255.
[4] Ibid., 224.

pulmonary involvement. Bronchitic changes with fullness of the lower chest and intrapulmonary shadows shown by *x*-ray examination were common. Roberts[5] stressed the danger of giving general anaesthesia in such cases. Hadfield, at the meeting, reported on the pathological lesions found in a series of cases; these were characterized by a macroscopical and microscopical appearance closely akin to that found in the various stages of pneumonia, but more irregular in distribution. Stress was laid by him on the amount of haemorrhage in the alveoli and the marked distension and engorgement of the capillaries. He emphasized that the appearances suggested continuation of the haemorrhage over a period of some days—a point which may explain the relapses which have been noted to occur.

It is too soon to determine in full the required treatment. Adequate rest is essential; and in view of the condition of the lungs found at necropsy, and the embarrassed breathing clinically, oxygen therapy would appear to be worthy of more extensive use. Above all, the knowledge that such damage to the lungs may occur should stimulate all to be watchful for this type of damage among air-raid casualties. The Emergency Medical Service has taken the lead and has circularized its officers. The future should bring greater and more accurate knowledge, but for the public and medical profession there is comfort in the thought that such cases are necessarily uncommon and that shelters, including the Anderson, give a high degree of protection against "blast."

WARTIME MEDICINE IN THE U.S.A.

As everyone knows who follows the news which reaches us daily from America, the Federal Government of the United States is pressing on with preparations for the dual purpose of securing its own national defence and helping us and our allies to a successful conclusion of the war. In this connexion the importance of the medical and allied services is fully recognized. It may be recalled that well before the onset of war the British Medical Association had set up a Central Emergency Committee which surveyed and classified all medical practitioners in the country and recorded their offers of service, and that this committee, enlarged and known now as the Central Medical War Committee, acting through local committees, has become the Government's agent for allocating medical personnel, whether voluntarily or under compulsion, for meeting military or civilian demands. Its functions do not extend to determining whether such demands are justifiable, but it foresaw that some co-ordinating body would be needed to scrutinize the establishments of the various medical services, and made a special point of this in its early negotiations with the Government. Subsequent experience has shown the wisdom of the committee's representations. In the United States the need for such a body has been appreciated. The Selective Training and Service Act, 1940, provides for the registration of more than sixteen million men, the immediate medical examination of two to four millions, and the military training forthwith of several hundred thousand. The view in America is that each stage in this process is of medical and public health importance. A Committee on Medical Preparedness of the American Medical Association has followed our plan of carrying out a survey by questionary of the medical profession, and similar censuses are being conducted in their own field by the American Dental Association, the Nursing Council for National Defence, and the American Hospital Association. It is realized that information ought also to be compiled as to laboratory services and personnel such as that now in the possession of a committee of the Medical Research Council in this country. In some special directions a shortage of trained personnel is anticipated—for example, in caring for the health of workers in the rapidly expanding war industries. The American Medical Association has accordingly urged the Council of National Defence to provide the U.S. Public Health Service with funds for the training of physicians, chemists, engineers, and other professional workers in industrial hygiene.

In the United States, where State governments are interposed between the Federal Government and local authorities, the system has been established by the U.S. Public Health Service of holding periodical conferences in Washington of State and Territorial health officers to discuss matters of common interest. A special conference of this kind was held on September 16 and 17, to which members of the National Advisory Health Council, officials of the Army, Navy, and other branches of the Government, and representatives of professional organizations and voluntary agencies were invited.[1] Its object was to plan and co-ordinate the medical and public health measures necessary for national defence. Surgeon-General Parran emphasized the need for preserving a balance between facilities to care for the civil and industrial population on the one hand and the demands of the military services on the other. This involved special consideration of key personnel in essential health and medical services and schemes of training to ensure an uninterrupted output of professional men and women to meet both civil and military demands. But his outline of the problem and the course of the subsequent deliberations revealed that public health departments in America are thinking of problems arising from the emergency which go far beyond the mere provision and allocation of personnel. Medical examination of recruits will discover many with diseases and defects requiring treatment and the restoration of working capacity which has come to be called rehabilitation. Apart from tuberculosis, which normally falls within the province of governmental care, it appeared to be the general opinion of the conference that the State should make itself responsible for seeing that all those found with defects should receive attention. As a corollary to the recent and vigorous drive against syphilis in America, opinion was unanimous on the desirability of arranging for a voluntary blood test of every man registering, although it was realized that the practical difficulties were enormous. In the course of examination the ascertainment of tuberculosis should be specially stressed and provision made in advance for the immediate treatment of the numerous early cases which would be discovered. The health of communities where training cantonments were set up would require more than usual attention, and the

[1] *British Medical Journal*, 1940, 2, 843.

[1] U.S. Public Health Service: *Public Health Reports*, 1940, 55, 1760.

movement of industrial workers into new areas where munition works are to be established would create problems of health and housing of which we have had experience. The American Navy, for instance, is already faced with the housing of many new hands employed in the Navy yards. It was contemplated that all measures to deal with these problems would be a proper charge against Government funds.

Two days after this conference had met President Roosevelt approved an order creating a Health and Medical Committee. Its function is to advise the Council of National Defence on health and medical problems and to co-ordinate health and medical activities affecting national defence.[2] The new committee is to be executive as well as advisory, being vested with power to use the facilities of the medical departments of the Army, Navy, and Public Health Service, including their laboratories and equipment, and to spend moneys allocated to it on studies, investigations, and reports by such individuals or institutions as it may employ. The wide terms of its reference would appear to cover the knotty problem of priority in demands for medical personnel, although in this respect it may be subject to the overriding authority of the Council of National Defence. The committee consists of Dr. Irvin Abell, a former president of the A.M.A., as chairman, the surgeon-generals of the Army, Navy, and Public Health Service, and the chairman of the Division of Medical Sciences of the National Research Council. Its constitution, it will be observed, is entirely medical. For this reason, and because of its small size, it should be able to exercise that control over medical matters in wartime which many would be glad to see effectively established in this country.

MEDICINE IN A CHANGING WORLD

In his stimulating article on "Trends in Human Nutrition" in our current issue, Sir John Orr, in a passage under the heading of "Medicine and the New World Order," makes a statement of the widest implication to the medical man of to-day and to-morrow. "The medical profession," he writes, "contains within it experts on every subject that affects human welfare. It is the only organized group of men competent to make a statement on human needs." This is certainly a startling claim to make on behalf of any group of men within a modern State, and if it has within it the seeds of exaggeration the sower may be excused, for he brings forcibly to the front ideas that have been simmering in the minds of an increasing number of men who see the art and science of medicine, not merely as the prescribing of pills and the ameliorative use of the knife, but as a contribution to human welfare. This is not to decry the art and the craft that are the foundation of the daily work of the doctor. Knowledge and more exact knowledge is what we need. The new techniques must be increasingly used, and with a thorough understanding of their possibilities of bringing more precise information to bear on the problems of health and disease. It is perhaps a paradox that at the very moment when medicine is acquiring a technical equipment that brings it within the narrowing confines of an exact science, with the inevitable tendency to specialization, it is reaching out to a wider conception of the part it has to play in human society. This paradox is also apparent in the attitude of other workers in pure and applied science. In fact, what we are witnessing is a heightened consciousness of social responsibility in a world in which the forces of disruption are momentarily paramount.

Sir John Orr's suggestion that there are in the ranks of medicine "experts on every subject that affects human welfare" must be examined more closely. Medicine cannot concern itself with the economic man, the political man, the religious man, the legal man. Indeed, it is not competent so to do. There is even the great danger that the doctor, acting as a doctor, may be tempted to prescribe political and economic remedies for what he considers to be medical and sociological ills, and somewhat ostentatiously to ally himself with one or other political movement. Once he is immersed in the heat of political emotions his judgment as a medical man tends to become warped when he looks at medical problems through political glasses. This is perhaps well illustrated by reference to the subject of Sir John Orr's lecture. There is no doubt that the distribution of wealth in this country has made it difficult, and in some cases impossible, for a large section of the population to buy enough of the right kind of food or to live in conditions that make for the maximum possible health. The medical man has investigated in some detail the effects on such a population of malnutrition. He has been rightly concerned with the wider effects on the country as a whole. But for the medical profession, or any section of it, to bring to bear the whole weight of its authority on such a fundamental matter as diet and nutrition it must speak in terms that are strictly medical and physiological, uncontaminated with political partisanship or economic theorizing. The cobbler must stick to his last. As a private citizen the doctor may cast his vote as freely as any other man in a democracy, but we do not believe that medical men, as such, can make any worthy contribution to either medicine or politics by segregating themselves into political groups.

We would modify Sir John Orr's second proposition and restate it in some such terms as follow: "The medical profession has within its numbers those who, more than any other group of men and women, are competent to make a statement on the physiological and psychological needs of human society." We would add, too, that such a statement would be incomplete. Nevertheless it should be made, and in the period of reconstruction to which we look forward some kind of statement will be expected by a country which, in the present terrible struggle, sees justification for it in the promise of a new world—what Mr. Churchill has called "the march of the common people towards their just and true inheritance and towards the broader and fuller life." This must be based on good food, good housing, free opportunity for physical and mental development, and comprehensive medical services for the whole community. The standards for these desiderata can be laid down in a medical charter, and this could be one of medicine's greatest contributions to the new epoch of which the present war is but a sign and a portent.

[2] U.S. Public Health Service: *Public Health Reports*, 1940, 55, 1759.

NEOARSPHENAMINE AND THE SULPHONAMIDES

In the early days of the 1914–18 war, when the science of chemotherapy was still almost synonymous with the study of the arsphenamines, certain striking results were obtained with these arsenicals in the treatment of bacterial infections. Schiemann[1] and others in Germany first showed that both arsphenamine and neoarsphenamine were bactericidal *in vitro* for the organisms of anthrax, glanders, and swine erysipelas. Later, Douglas and Colebrook[2] found that the serum of a patient to whom either arsphenamine or neoarsphenamine had been administered possessed a bactericidal action on staphylococci, while Joanny[3] among others put forward great claims for these compounds in the treatment of puerperal sepsis. Colebrook,[4] however, was less enthusiastic, although sulpharsphenamine appeared to have certain possibilities; with the advent of the sulphonamides these studies seemed, for the moment at least, forgotten. Recently, however, Osgood, Joski, and Brownlee[5] have returned to an investigation of neoarsphenamine in relation to sulphonamide compounds. By growing the cells of the human bone marrow in tissue culture it has been possible to develop a method for the accurate quantitative comparison of therapeutic agents against bacterial infections. When the bone-marrow cultures were infected with *Staph. aureus* it was found that neoarsphenamine in concentrations of 1 in 150,000 to 1 in 200,000 was more effective than either sulphanilamide, sulphapyridine, sulphathiazole, or sulphamethylthiazole. In concentrations of 1 in 10,000 sulphamethylthiazole and sulphathiazole were of considerable value but rarely led to complete sterility; sulphapyridine was only slightly effective and sulphanilamide was practically useless. Concentrations of neoarsphenamine above 1 in 150,000 were toxic to the marrow cells, and concentrations above 1 in 70,000 killed all the cells. These studies certainly suggest that administration of neoarsphenamine in intermittent courses of repeated small doses together with sulphathiazole in doses sufficient to give a blood concentration of 1 in 10,000 is worthy of controlled clinical investigation in serious cases of infection due to *Staph. aureus*. Since sulphamethylthiazole is liable to produce polyneuritis in man, sulphathiazole is the most satisfactory sulphonamide derivative for use in these tests.

SARCOIDOSIS OF BOECK

The history of the disease which still goes by this unsatisfactory name is one of unification by histological study of manifestations which clinically had appeared unrelated. To Schaumann belongs the credit of pointing out that the skin condition originally described by Boeck is only one localization of a process which may also involve many other organs, notably the lymph glands, spleen, and lungs, and there is much to be said for calling the disease by his own name, or for adopting the term "benign lymphogranulomatosis" which he suggested. Other manifestations of the same disease are the uveo-parotid syndrome of Heerfordt and bony changes in the hands and feet to which Jungling gave the name "osteitis multiplex cystica." In all these situations the histological changes produced closely simulate those of a tuberculous lesion in the proliferative stage, but caseation never follows and the ultimate fate of the lesion is usually complete resolution. The varied features of this disease were fully described in this *Journal*[6] two years ago by Bodley Scott, and it has again been fully reviewed by Leitner.[7] Now that its clinical recognition in whatever form has been made feasible, interest is centred on the problem of its aetiology. The structure of the lesion being indistinguishable from that of an early tuberculous focus, the main question is naturally whether the disease is a form of tuberculosis. Tubercle bacilli are not demonstrable in the lesions either directly or even by animal inoculation; the exceptions to this statement undoubtedly represent the coincidence of two conditions, and are no more significant than the occasional occurrence of tubercle bacilli in lymph nodes attacked by lymphadenoma. The majority of patients show no tuberculin sensitivity; indeed, they are said to be more often Mantoux-negative than unaffected persons of the same age. This anomalous finding led Jadassohn to postulate a condition of "positive anergy" in this disease, a term implying that in spite of or in consequence of actual tuberculous infection tuberculin sensitiveness has been abolished or has failed to develop. It occurred to Lemming[8] that this hypothesis could be tested by inoculating cases of the disease with B.C.G., the effect of which is to produce tuberculin sensitiveness in a previously Mantoux-negative or "negatively anergic" normal individual. He accordingly gave 0.05 mg. living B.C.G. to a typical case of uveo-parotitis, and when this was without effect of any kind followed this with a dose three times larger. A local reaction followed with swelling of the regional lymph nodes, but a Mantoux test with 5 mg. of tuberculin was still negative. Not only this, but when one of the affected nodes was excised the changes in it produced by B.C.G. corresponded in certain details rather to those of benign lymphogranulomatosis than to those which usually follow B.C.G. vaccination; the tissues had in fact reacted to vaccination just as they react in the disease itself. Repeated doses of B.C.G. in another case in which mediastinal and other lymph nodes were mainly involved failed to alter the patient's negative Mantoux reaction. While other authors can only report negative findings and speculate on the question of aetiology, these are positive facts which deserve the closest attention. But if this process is indeed tuberculous, it still remains to be explained why a lesion in which no bacilli are demonstrable, in a patient who *ex hypothesi* possesses a considerable degree of immunity, should not only persist for years but continue to develop in fresh situations.

EFFECTS OF PRESSURE ON TISSUES

A man of 185 lb. weight exerts a pressure on the soles of his feet in excess of that needed to support a column of mercury 500 mm. high. Healthy tissues are thus designed to withstand considerable pressures, the degree varying with the different body structures. Abnormal pressures, either internal or external, may lead to important tissue changes—for example, the atrophic changes which take place round a rapidly growing tumour, and the tissue destruction associated with bed-sores. Pressure is also an almost invariable accompaniment of many forms of surgical treatment; every suture and every ligature subjects living tissues to abnormal pressures, and gross pathological changes result from pressure in the case of plaster sores and Volkmann's ischaemic contracture. It has also been shown that free skin transplants are better able to withstand the effects of pressure than are pedicle grafts. John Hunter was one of the first to recognize the pathological effects caused by pressure, and came to the conclusion that internal pressure produced

[1] *Z. ImmunForsch.*, 1915, 24, 167.
[2] *Lancet*, 1916, 1, 181.
[3] *Thèse Paris*, 1923.
[4] Med. Res. Counc. Spec. Rep. Series, No. 119, London, H.M. Stationery Office.
[5] *Surg. Gynec. Obstet.*, 1940, 71, 445.
[6] *British Medical Journal*, 1938, 2, 777.
[7] *Schweiz. med. Wschr.*, 1940, 70, 411, 441, 461.
[8] *Acta med. scand.*, 1940, 103, 400.

atrophy and that external pressure produced hypertrophy. It was Paget who pointed out that this was one of the rare instances where Hunter was wrong, and showed that constant pressure leads to atrophic changes and inconstant pressure to hypertrophic changes. He also pointed out that it just happens that intermittent pressures are usually from without, while constant pressures are usually from within. Recently Brooks and Duncan[1] have carried out a series of experiments on the rat's tail to determine the influence of known amounts of pressure applied for measured periods on the various specific tissues. It was found that a pressure of 130 mm. of mercury for eighteen hours (approximately equal to the blood pressure in the rat's tail) was necessary before necrosis developed. One series of animals were then subjected to pressures adequate to produce massive necrosis; the arteries were subsequently injected and found to be patent. Very high pressures caused pathological changes in much shorter times. The tissue changes observed by these workers in a number of experiments included epithelial hyperplasia, scaling, muscle degeneration, replacement fibrosis, and varying degrees of necrosis. There was very little difference in the time required to produce sclerosing myositis and that required to produce massive necrosis. These experiments have a bearing on the question of pathological changes caused by abnormal pressure associated with bedsores, constricting bandages, plasters, tourniquets, and sutures, and may throw light on many of the problems relating to the effects of pressure on tissues. Meanwhile, they are being continued in animals suffering from dietary insufficiency, hyperglycaemia, and alterations in blood pressure.

TREATMENT OF VAGINAL THRUSH

The frequency of thrush as a cause of leucorrhoea is not apparently generally recognized. Liston and Cruickshank[2] found that it accounted for nearly 25% of cases in a series of 200 pregnant women. It appears necessary, therefore, to look for this fungus (*Oïdium albicans*) in all cases of leucorrhoea, and to seek for the hyphal filaments in films made from the white patches which are characteristic of the disease or from vaginal washings. The infection is much commoner in pregnant than in non-pregnant women, and frequently clears up during the puerperium; non-pregnant women often get relief during menstruation. The presence of glucose is favourable to the growth of the parasite, and diabetes mellitus is a predisposing cause, which should always be excluded in non-pregnant cases. While the infection is usually confined to the vagina and surrounding skin, it may affect the cervix and even the uterus and tubes. This should be borne in mind in those cases which either prove resistant to treatment or show a tendency to relapse. Should the infection have passed beyond the cervical canal the patient should be referred to a gynaecologist. In all cases of vaginal thrush it is first necessary to look for and to deal with any contributory factors such as cervical erosion, cervicitis, and tears of the cervix uteri, and then to remember that the infection may affect the surrounding skin, not only of the vulva but also of the pubic region, groins, and upper part of the thighs, causing intense irritation. Various remedies have been recommended. Matters[3] swabs the vaginal walls with hydrogen peroxide or dilute liquor potassae, and after drying them insufflates the vagina with powdered silver picrate in kaolin; alternatively, Bonney's blue may be employed as a paint. Mary Michael-Shaw douches with sodium bicarbonate—one drachm to the pint—and follows this with a tablet of stovarsol nightly for two weeks and then less frequently for four to six weeks or even longer. Negatol as used for trichomonas infestation—a douche of 2½% followed by painting with 100%—and "monsol" 1/200 have given good results. Strong negatol causes the mucous membrane of the vagina to become covered with a thick white film, which after a time is shed gradually or may separate as a complete cast, leaving a healthy epithelial surface underneath. Probably the most efficient remedy and the one that gives the greatest relief to the patient is gentian violet. This is used as an aqueous solution in a strength of 1% to 2% and should be painted on the affected parts twice weekly, special care being taken to include all vaginal folds and especially the posterior fornix. The treatment of vaginal thrush should not be stopped when the signs and symptoms subside, because of the tendency to relapse. The patient should be warned that cessation of symptoms must not be taken as evidence of cure.

[1] *Arch. Surg.*, 1940, 40, 696.
[2] *J. Obstet. Gynaec. Brit. Emp.*, 1940, 47, 109.
[3] *Med. J. Austral.*, 1940, 1, 693.

EMPLOYMENT OF OVERSEA DOCTORS

In view of the increasing demands on the services of doctors for war purposes, two Orders have been made, under the powers of the Defence Regulations, authorizing the General Medical Council to include oversea doctors temporarily in the *Medical Register* under certain conditions. The first Order applies to doctors qualified to practise in Canada or the United States of America. They must be of British nationality or United States citizens. There is no specific condition as to employment, but the object of the Order is to facilitate their employment in the Emergency Medical Service. The second Order applies to doctors qualified to practise in any part of the British Empire or in the countries of our European Allies, or in Germany or Italy. One of the conditions of registration is that the doctor must be selected either for a medical commission in one of the fighting Forces or for employment in a hospital, institution, or service, not involving attendance in the patient's own home, approved by the Minister of Health (or in Scotland or Northern Ireland the appropriate Secretary of State). The main objects of this Order are (1) to facilitate the employment of medical officers in the allied Forces in the United Kingdom by giving them the privileges of registered medical practitioners, and (2) to facilitate the employment of Dominion and foreign doctors in civil hospitals by giving them the same privileges. The Orders do not affect the operation of the Aliens Acts and Orders. The Central Medical War Committees for England and Wales and for Scotland are compiling a list of doctors likely to be available for civilian employment and qualified for registration under the Orders. Any of these doctors may make a provisional application to the General Medical Council for registration, in order to avoid delay in the final registration when he is selected for employment. Mr. Malcolm MacDonald, the Minister of Health, is sending a circular to local authorities and other hospital-owning bodies drawing their attention to the Orders and advising them to take advantage of the new arrangements for filling vacancies for which British doctors are not available or in order to free British doctors for war service. A similar circular is being issued by the Secretary of State for Scotland.

We print on page 94 of this issue a brief statement on the Nuffield Provincial Hospitals Trust, and an important letter sent by the Minister of Health, Mr. Malcolm MacDonald, to Mr. W. M. Goodenough, the chairman of the Trust.

NUFFIELD PROVINCIAL HOSPITALS TRUST

This Trust was founded by Lord Nuffield in December, 1939, with the object of promoting a proper co-ordination of hospital services throughout the provinces in England, Scotland, and Northern Ireland, by means of full co-operation between the voluntary hospitals and public health authorities, in close consultation with the Minister of Health and the Secretary of State for Scotland. It was hoped that arrangements to this end would be agreed upon a regional basis connected with appropriate hospital and medical teaching centres. It was understood that close contact would be maintained between the Trust and King Edward's Hospital Fund for London.

At the end of twelve months the Chairman of the Trustees has reported to the Minister of Health. The Central Regionalization Council of the Trust has been formed, on which the Provisional Central Council of the British Hospitals Association is represented. A medical advisory council has also been established under the chairmanship of Sir Farquhar Buzzard. An advisory committee of the Trust has been established in Scotland under Mr. Tom Johnston as chairman, with a medical advisory committee under Sir John Fraser.

Discussions on arrangements for regionalization of hospital services have taken place in many important provincial centres with representatives of the public health authorities and of voluntary hospitals. In some of these centres plans for the formation of regional councils are already completed or are well advanced, and it is hoped to set them in motion in many others at an early date. The Trustees expect to be able to consider the question of financial grants to regional councils from the income of the Trust very shortly.

Having been informed of the progress made, the Minister of Health has addressed the following letter to the chairman of the Trustees:

Ministry of Health,
Whitehall, S.W.1,
January 6, 1941.

Dear Goodenough,

I have been keenly interested in my various discussions with you and your colleagues of the Nuffield Provincial Hospitals Trust to learn details of the Trust's present and prospective work, and should like to assure you of my warm sympathy and continuing support in the valuable work that you are doing. The question of post-war hospital policy is one of major importance, and I am sure that the Trust is right in attempting, even during the heat and labour of the present struggle, to focus discussion by bringing together in its regional councils representatives of the various interests concerned with a view to clearing the ground for future action. I can assure you that in the Ministry of Health much careful preparatory thought is being given to this problem, as well as to the wider questions concerning the medical and health services of the nation.

Let me add that I think you are right in concentrating on two points. Whatever may be the proper ultimate hospital service, we should build up from existing organizations, and the first is, therefore, to find the right relation between the local authorities on the one hand and the voluntary hospitals on the other. Both have played a great part in our hospital system in the past and will, I am convinced, make essential contributions to the future. There is, as you know, a variety of ways in which under the existing law a fruitful co-operation between local authorities and voluntary hospitals can be achieved, and I do not doubt that further methods of mutual assistance and co-operation can and should be devised.

Secondly, I am convinced that the problem is one that must be examined on a basis wider than that of existing local government areas and that some form of regional unit will be necessary in designing a system which will make the best use of our existing hospital accommodation and will avoid duplication and waste in making good any deficiencies. The precise manner in which a regional conception of this kind should be fitted into the existing system of local government is in itself a problem calling for most careful, constructive consideration, and I am very glad to know that the local authorities, through their representatives on your regional councils, are taking an active part in the discussions which the Trust has set on foot.

I remember Lord Nuffield telling me on one occasion that it was his early ambition to be a doctor. I am exceedingly glad that he did not realize his ambition. It is not that patients would not have benefited greatly by his skilful attention, but that by turning his great abilities in another direction he has incidentally been able to perform services to Medicine which are unique in their generosity and wisdom, and which place him for ever amongst the unselfish benefactors of mankind.

Yours sincerely,

(Signed) MALCOLM MACDONALD.

W. M. Goodenough, Esq.,
54, Lombard Street, E.C.3.

Reports of Societies

PROBLEMS OF BLAST INJURIES

The Sections of Surgery and of Pathology of the Royal Society of Medicine joined together for a discussion on January 8 on "Problems of Blast Injuries," Mr. J. B. HUNTER occupying the chair.

Prof. S. ZUCKERMAN, after a reference to earlier literature on the subject, described experiments carried out under the aegis of the Research and Experiments Department, Ministry of Home Security, with a view to defining first of all the scale of damage which follows upon exposure to charges of different magnitude. The experiments were carried out on animals, using explosive in paper containers in order to avoid any confusion of results due to missiles.

The effects of blast had been the subject of a good deal of misconception and misstatement. When an explosive detonated, a certain amount of solid substance was converted almost instantaneously into a very much larger volume of gas. When this took place in the metal casing of a bomb a pressure was set up, variously estimated at from 100 to 600 lb. per square inch, as a result of which the bomb casing burst and the gas by expansion imparted pressure to the surrounding atmosphere. The blast wave constituted by this expanding zone of pressure moved extremely rapidly, especially close to the bomb. The wave of increased pressure left behind it a zone of rarefaction, so that behind the advancing front of the blast there was a region of decreased atmospheric pressure. If the amount of pressure were measured according to the distance from the explosion it would be found that close to the bomb the pressure was abnormally high, but that it fell off very rapidly. Taking a large bomb, no very serious pressures from the clinical point of view would be experienced thirty or forty feet away, and at sixty or seventy feet the pressures did not really matter at all clinically, even though they might be sufficient to damage walls and windows.

Experimental Findings

The experiments, Prof. Zuckerman continued, had been carried out on mice, rats, guinea-pigs, rabbits, cats, and monkeys. Different species varied in their susceptibility to given blast pressures. As a general rule it took at least 50 lb. excess pressure per square inch to kill an animal such as a rabbit, and lesions had not been observed with pressures lower than 5 lb. per square inch. Near to the explosion the animals would be found dead within one minute, usually with blood-stained froth in the mouth and nose. Further away, in a zone of lower pressure, the animals would die, as a rule, within twenty-four hours. The clinical features were fairly constant, including air hunger and dyspnoea, but the

animals were nevertheless capable of great physical exertion. Knee-jerks were present, the pupils responded to light, the corneal reflex was in evidence, and hearing did not seem to be very much impaired. Such was the general picture of the animals exposed in the fatal, but not immediately fatal, zone. Further away was a zone in which the animals survived and recovered, and in which they showed no external appearances of injury, though post-mortem examination revealed internal changes.

The changes observed post mortem varied in intensity according to the pressures to which the animals were subjected. The lungs might show minute lesions or severe haemorrhages, which were apparent on the surface and sometimes followed the line of the ribs. In animals which had been exposed to very high pressures the lungs were found to be practically one mass of haemorrhages, with practically no normal substance left. The haemorrhages were not merely pleural; they extended right into the substance of the lung. Occasionally laceration was found, sometimes following the line of the ribs, and with lacerations pneumothorax and haemothorax occurred.

There had been numerous speculations as to how these changes were caused. The view which the experiments substantiated was that the lesions were due to the impact on the body wall of the pressure component of the blast wave. Rabbits were exposed to explosions of hydrogen and oxygen in balloons. When very close to the balloons the lesions were found to be mainly or entirely localized to the side facing the balloon. It appeared to be a direct impact effect, not some general effect through the trachea; if the latter, the lesions would be expected to be bilateral. In another set of experiments one half of the animal was covered with sponge rubber; if the covered side were placed towards the explosion the animal received practically no lesions, but if the covered side were away from the explosion it received many lesions on the side facing the explosion and a few sometimes on the covered side. Pulmonary lesions due to blast were thus at least partly comparable with those due to simple severe falls or blows—of which there were numerous examples in the literature.

No changes have been observed in the heart muscle or in the endocardium, although when sudden death occurred right-sided dilatation was found. Pericardial and epicardial haemorrhage had been observed. Out of several hundred cases all of which had lung lesions, 40% had abdominal lesions also. The intestine was specially susceptible, and haemorrhages had been observed extending around several inches of the gut, rupture of the gut had also been observed. Lesions also occurred in the liver and spleen, less frequently in the kidneys and adrenals, and sometimes in the bladder, particularly around the neck. As for the head and neck, there was bruising around the eyes and in the fascial planes of the orbital cavities. Rupture of the ear drums was observed at high pressures. In monkeys no lesions were observed in the brain itself (in the cortex, mid-brain, pons, and medulla), but in the cord haemorrhages were found around the spinal roots, especially in the thoracic region. Similar but more extensive haemorrhages had been observed in rabbits.

The Clinical Problem

The injuries whose effects he had described were caused by blast alone. A bomb, however, was not a paper container of high explosive. Part of the blast wave was taken up in shattering the bomb casing. The bomb pulled down buildings, sent secondary missiles flying, and in the process of causing these many effects the blast pressure became much decreased. The attenuated blast wave, although it might act like a heavy wind and throw a man against a hard surface, was incapable of causing direct injuries such as he had been describing. A special casualty survey, in which cases had been differentiated according to the circumstances in which each casualty occurred, had made it plain that the danger zone within which the primary effects of blast would be experienced was very limited. There was little likelihood that if one was lucky enough to escape splinter wounds from the detonation of a bomb on the surface one would be killed by the direct effects of the blast of a big bomb further than thirty feet away, and in the case of a small bomb further than, say, about ten feet. Internal lesions, especially in the lungs, which might be observed at further distances were probably not due to blast at all, but to violent falls or the impact of flying or falling masonry.

In general, very few cases of injury due to direct effects of blast had been observed. Sometimes a death had been ascribed to blast when it was in fact due to secondary or tertiary blast effects such as falling masonry. Out of about sixty casualties included in the special casualty survey, post-mortem examinations had been carried out in ten cases. In seven there was lung bruising, but in only one were the circumstances such that the bruising could be ascribed to the direct effect of blast alone. From these observations he concluded that the direct effects of blast alone were rarely the cause of death in air raids; and that when blast injuries did occur they were often mixed up with injuries caused by other agencies.

Some cases of non-fatal injuries due to blast had been seen. One such case was of a man in an anti-aircraft unit who was running to his post when an "alert" sounded; bombs fell and he found himself between three explosions, none further than about twenty-five yards. He was thrown down by the blast, picked himself up, when another bomb again threw him down. Finding himself apparently uninjured, he went to an air-raid shelter, where he started to cough up blood; as he had no external wounds he carried on with his job. Later he had to go into hospital, where he remained for sixteen days, and x-ray films showed shadows in the right base of the lung, which eventually cleared up.

Prof. Zuckerman concluded by again emphasizing that in the case of non-fatal injuries presumed to be due to blast x-ray examination, also an examination of the ear drums, and particularly examination for external injuries, should be made before a diagnosis of primary effects of blast was decided on. Some of the dead brought in after air raids who showed no external sign of injury had died of asphyxiation or of carbon monoxide poisoning. In other cases in which lung injury was found the lesions were usually due not so much to the direct impact of the blast wave as to a blow by some hard substance on the body wall. What actually caused death in such cases—in fact, what caused death in experimental animals subjected to blast alone—was not known, and it was to the solution of that problem that some experiments at the present moment were being directed.

Lung Injuries caused by Blast

Prof. GEOFFREY HADFIELD based his remarks on thirty post-mortem examinations which he and a number of colleagues whom he named had carried out. In eight of these cases there were haemorrhages into the lung without significant external injuries. In four cases there were pulmonary haemorrhages of considerable degree, associated with much saturation of the blood with carbon monoxide. In two cases there were pulmonary haemorrhages and an associated injury not considered to be fatal, such as a fractured limb. In three cases in which the patient had recent haemorrhages into the lung the lung itself showed severe chronic bronchitis and emphysema. Two patients proved to have died from compression asphyxia, and three from asphyxia due to inhalation of finely divided chalk, plaster, and brick dust. Out of the thirty patients who were considered to have died from "blast," eight showed no evidence of a pulmonary lesion. The haemorrhages were frequently deep in the lung and occasionally gave relatively little indication on the surface that they were so extensive. Naked-eye laceration of the lung was not found in the absence of damage to the thoracic wall. No very great degree of rupture of the alveolar walls was found, and very frequently there were large numbers of alveoli whose walls appeared to be quite intact.

The amount of haemorrhage into the lung in these fatal cases varied within very wide limits. He and his colleagues felt that if a patient did recover from the initial explosion bleeding still continued in the lung, so that those who survived showed very much larger areas of haemorrhage than were apparent in those who were found dead. He instanced one victim who had lived for fifty-one hours and had continued to

bleed into his lung during the whole of that time. Prof. Hadfield showed slides illustrating the general and the microscopical appearance of the lung in these cases, and pointed out the significance of the different areas. His deduction again was that bleeding might continue for at least forty-eight hours and reach a considerable degree, causihg consolidation of very large areas of the lung.

After describing in detail the story of the victim who had lived for fifty-one hours after the explosion, and who developed a syndrome which could be said to have been due to generalized capillary congestion of the lesser circuit, with relief of most of his urgent symptoms by venesection, Prof. Hadfield said that, after what Prof. Zuckerman had emphasized, he did not wish to claim that the cases described were due to the pure effects of blast. Seventeen of them, however, showed extensive pulmonary bleeding without significant injury to the thoracic parietes, and one point he wished to make as a result of this post-mortem research was that the primary and essential lesion of pulmonary blast may be widespread dilatation and congestion of the alveolar capillaries. It was worth while considering whether a good deal of the intra-alveolar capillary bleeding was due to diapedesis. If the histological picture were combined with the clinical findings during life, it was rather more easy to explain the latter on the basis of generalized vasodilatation of the whole lung on both sides rather than by the bleeding itself. It seemed that the major clinical manifestations shown by these patients were due more to this enormous capillary dilatation of the lung than to actual bleeding, which might well be an expression of the vasodilatation.

Prof. Hadfield concluded by saying that he felt that his contribution to the discussion, founded as it was on human material, was rather a premature one. What he had said was founded on a very short experience, but the evidence did point to this single fact—that following exposure to detonation of a high-explosive bomb bleeding into the lung could continue for a period of days. This must, of course, have an influence on treatment, and patients should be kept immobile and treated as for haemoptysis.

General Discussion

Dr. J. N. O'REILLY said that in three cases which he had been investigating one clinical point had emerged—that within forty-eight hours in two of them and within four days in the other the cases had apparently become those of ordinary clinical lobar pneumonia. Another point was that five patients belonging to the same "incident" were brought in with the appearance of acute abdominal catastrophe—rigid abdomen, pain, and so on—and two of the cases were sufficiently serious to require surgical intervention; but nothing was found except a few minute subserous haemorrhages. Dr. J. M. ALSTON asked whether Prof. Zuckerman's work had gone far enough in the direction he had indicated to decide whether the animals which survived the shock experiments showed the lesions of pseudo-pneumonia, as Dr. Hadfield had suggested. Dr. BERYL BARSBY had seen two cases of injury unquestionably due to blast in which there was spontaneous haemothorax, with *x*-ray evidence of blast on the other side and ruptured spleen

Prof. ZUCKERMAN, in replying on the discussion, said that he had seen no evidence of haemorrhage continuing in the lungs of experimental animals as a result of exposure to blast, although lesions were often better marked in animals which survived for some time than in animals killed outright by blast. He added again that he was not convinced, without knowing in detail about the circumstances of injury, that haemorrhagic lesions in the lungs which were observed in air-raid casualties were due to blast alone. The possibility that such lesions might in some cases be due to violent falls or the impact of solid bodies should, he felt, also be borne in mind.

Two hospitals for casualties for the British Forces in the Middle East are to be established in South Africa at the request of the British Government. They will be situated near Johannesburg and Port Elizabeth.

Correspondence

Epidemic Influenza

SIR,—The letter by Dr. William Hartston on the above subject (December 21, p. 878) accuses me and my colleagues at the National Institute for Medical Research of retarding a simple understanding of the disease "influenza." As the clinical member of this team of workers until recently, I am sorry if our work has retarded a clear understanding of "influenza" by any of my fellow clinicians. However, it is my opinion that at the present time any simple understanding of the syndrome of clinical influenza is an illusion.

In any investigation of a clinical condition it is necessary to proceed from the known to the unknown. Thus in 1937 the ferret-pathogenic virus now termed "influenza virus A" (*Lancet*, 1940, **2**, 413) had been recovered in various parts of the world only from outbreaks of respiratory disease occurring during widespread epidemics of influenza in the community. It had not been recovered from sporadic cases of influenza, nor from several localized outbreaks of respiratory disease occurring in schools and Service institutions. At that time clinical and epidemiological differences were detected between the latter outbreaks (then termed "febrile catarrhs") and the one widespread epidemic of virus A influenza which had been studied (Medical Research Council Special Report, No. 228, 1938). Wilson Smith, Andrewes, and I therefore chose to refer to the ferret-pathogenic virus as "epidemic influenza virus" to avoid confusion with these other diseases of unknown aetiology. The care with which this term was used by us on all possible occasions was apparently lost on Dr. Hartston, who now pleads that we had failed to recognize the existence of an *endemic* clinical influenza not due to any known virus!

In 1939 there occurred in Great Britain an epidemic of influenza which differed from that of 1937 in having a lower incidence of pneumonia (*Lancet*, 1940, **1**, 205). During this epidemic the ferret-pathogenic influenza virus A was not absent, as Dr. Hartston states, but evidence of its presence as an infecting agent was found in approximately 30% of cases only. At the bedside I found it impossible to distinguish cases which would yield influenza virus A from those where the virus was not demonstrable. The investigations of Dr. Wilson Smith and Dr. Andrewes upon the cases of clinical influenza which were virus-negative on ferret test led them to suspect that another virus unrelated to influenza virus A was responsible for the clinical condition. All attempts to demonstrate this hypothetical virus, however, were fruitless. The investigation of future outbreaks will doubtless decide whether epidemics of influenza are at times aetiologically diverse, as was suspected in 1939.

Meanwhile, Francis in New York (*Science*, 1940, November 1) has succeeded in recovering a virus weakly pathogenic for the ferret but serologically quite distinct from influenza virus A from patients during an outbreak of influenza in 1940. This virus has been christened by him "influenza virus B," and its existence reveals clearly the aetiological diversity of the clinical condition "influenza." It is probable that we are only upon the threshold of knowledge concerning the pathology of epidemics of influenza. In the present circumstances it seems to me unreasonable to demand a clarification of the term "influenza." We must await further knowledge, and I would plead for patience on the part of those clinicians who find the ways of research workers laborious and even confusing.

In conclusion, I do not propose to criticize Dr. Hartston's suggestion for forecasting influenza pandemics, because we have as yet no certain knowledge of the causation of pandemic influenza.—I am, etc.,

C. H. STUART-HARRIS,
Major, R.A.M.C.

Jan. 4.

Medical Planning Commission

SIR,—I wish to congratulate the Executive Committee and the Council on the personnel of the Medical Planning Commission. I am not quite clear as to the powers and functions

of the body, and being jealous of the rights of ordinary members and democratic ruling of the Association I am anxious to be told what these are.

The terms of reference are quoted as being, "To study wartime developments and their effects on the country's medical services, both present and future." Did the Council of the Association find this too big a job? In my opinion it should not have been had the Representative Body and the Branches elected their members with sufficient care. However, the Council has, without any reference to the Divisions and Branches, appointed the Commission, and since we as a Representative Body gave these powers to the Council we can have no grounds for criticism.

Will the Commission report direct to Council? Will the Divisions and Branches have a chance to study and if necessary criticize its findings? I understand that the real work will be done in committees set up by the Commission itself. In what way will the duties of these committees differ from those of the committees elected by the Representative Body in Aberdeen in 1939? Is there any new aspect of medicine which does not come within the purview of those committees?

Your leading article (January 4, p. 19) says, "War has thrown up into sharp relief the deficiencies of our peacetime system of administering relief to the sick and of promoting and maintaining the health of the people." If the report of this Commission is endorsed by the members as a whole, will it not prove that the war has also shown that within the Association our present system of self-government and election is also deficient, since it was found that such an important work was beyond those we elected?

The task which is set for the Commission is great and necessary. It is obvious to many of us that a change will be necessary after this war is over, but this is not a result of the war; it has been on the medico-political horizon for many years; the war has made some people see it more clearly. Mr. Walker's admirable speech at Aberdeen in July, 1939, though not covering the whole ground, made many of us who talked on this subject outside the meeting realize that we all agreed on at least one principle—namely, that a change, and a radical change, was necessary.

It would be most desirable that, when the Commission's report is presented, before adopting it or any part of it the Council should send it to the Branches and Divisions and also find a way for the Service members to discuss it, for they will be concerned very materially when they return to civilian practice. The correspondence columns, which are at the moment practically the only medium of discussion, are not adequate for the purpose of discussion on a problem of such magnitude.—I am, etc.,

Yardley, Jan. 7. ARTHUR BEAUCHAMP

*** The Secretary of the British Medical Association states that Dr. Beauchamp may rest assured that the Commission will report direct to the Council of the Association, and that Divisions and Division Branches will have a chance to study and, if necessary, to criticize the findings of the Commission.

SIR,—The problems that will face England at the end of the war will be many and great. It is possible, I suppose, to return to the pre-war medical position, but even if this is possible it should be refused, for the only chance of a better medical service will be to cut away completely from the old order.

Already before the war the B.M.A. had foreseen coming trouble and had tried to put its house in order, but unfortunately the changes suggested were not radical enough. Now the Commission faces an enormous task—a task with which no preconceived ideas should be allowed to interfere. The background to all these difficulties is, first, the impoverished state of our country, and, secondly, the unsatisfactory nature of pre-war medical practice.

The problems with which I wish to deal in this letter are two. First there is the problem of the return of evacuated medical men to their areas before the return of the population, and the consequent financial suffering of all; surely the Government should be pressed at an early date to allow of only gradual return and to make financial arrangements to tide over this difficult period. Secondly there is the problem of voluntary hospitals in evacuated districts at the end of the war: the impoverishment of the much smaller population will make it difficult, if not impossible, to raise sufficient funds to maintain these hospitals, and it seems to me that only State aid can possibly save our hospitals.

I am convinced that the future of medical practice in England will be a full-time State medical service with a pension at 60. Two difficulties will have to be faced. The first is the prevention of lack of initiative due to the sense of security afforded by the Civil Service, and this danger will be even more prevalent in the medical service. The remedy is to have promotion, to a considerable extent, dependent on the success of the practitioner. The second will only exist at the beginning of the service, and is caused by the fact that the purchase price of the practice is, often enough, the only capital the general practitioner can save for his children. This capital should be repaid, and in the case of the medical men of 60 or over who are compelled to retire on a pension their capital could be repaid by capitalizing part of their pensions.

These are but some of the ways by which we hope to obtain a medical service satisfactory both to the nation and to the medical profession. The Commission must achieve success, for if this self-appointed Commission fails, never again will the medical profession have a chance of setting its house in order. —I am, etc.,

Felixstowe, Jan. 6. P. L. GIUSEPPI.

Transplacental Tuberculosis and Transplacental Melanomatosis

SIR,—Dr. Monica Davin-Power's case (January 4, p. 13) appears, as she claims, to be a genuine example of transplacental tuberculous infection, although the placenta was not examined, and one may remember that Schmorl declared that as many as 20,000 sections might have to be gone through under the microscope before tuberculous lesions, even when really present, could be found in a placenta.

The study of the very rare published cases of proved transplacental tuberculous infection[1] throws light on the possible transplacental infection of the foetus in other microbic diseases. To my mind it also suggests that in extremely rare cases a woman suffering from disseminated metastases of some malignant neoplasm might become pregnant. If so, one or more metastases might occur in the placenta, and might "grow through" the placenta into the foetal circulation, tumour cells thus passing via the umbilical vein to the foetal liver. The child might then be born apparently free from disease. After seven months or so, on examination its liver might be found irregularly enlarged, and later on it might begin to lose weight, and, with increasing cachexia, die nine or ten months after birth, with multiple malignant neoplasms, mostly in the liver. Nevertheless, I know of only one recorded case in which this really was proved to have happened. The case in question was one of malignant melanomatosis, which I published conjointly with my colleagues Dr. E. Schwarz and Dr. R. Hellenschmied in the *Lancet* in 1930 (**1**, 537). The infant's mother had died three months after childbirth with visceral and subcutaneous metastatic melanomata. Mr. Eardley Holland was fortunately able to assure us that the placenta was huge and black, and proved on examination to be infiltrated with masses of melanotic growth. The child's liver, now in the museum of the Royal College of Surgeons of England, was demonstrated by us on February 28, 1930, at the Royal Society of Medicine. The nature and whole course of the neoplastic disease in mother and child were proved to the hilt.—I am, etc.,

London, W.1, Jan. 6. F. PARKES WEBER.

Sunlight Treatment

SIR,—One is somewhat surprised to see that the letter published under this title in your issue of December 21 (p. 883) is signed by Dr. Albert Eidinow. As a whole it conveys the impression of decrying actinotherapy in general and the mercury vapour lamp in particular—an impression which I am sure Dr. Eidinow did not intend to convey, and which no user of actinotherapy would wish to leave on record unexpunged.

[1] Weber, F. P., "Congenital Tuberculosis—A Survey," *Brit. J. Child. Dis.*, 1916, **13**, 321, 359.

On one point of fact Dr. Eidinow appears to be gravely misled in his statement: "Unfortunately the therapeutic value of the rays of the mercury spectrum is derived from the ultra-violet rays of short wave-lengths—from 2,970 Ä.U. to 2,500 Ä.U. These rays are completely absent in sunlight as received at the sea level." This statement correctly describes a low-pressure mercury discharge tube on Geissler principles (what our American friends term a "cold quartz lamp"), but is quite at variance with recent determinations of the output from a high-pressure mercury arc as commonly used by electro-therapists in this country. The radiation from such a source —that is, from the arc itself (disregarding heated metal reflectors)—is distributed as follows:

A. Non-solar erythema-producing ultra-violet from 1,850 to 2,800 Ä.U.	18.5%
B. "Dorno" rays—that is, erythema-producing ultra-violet, 2,800 to 3,200 Ä.U., corresponding to mountain sunshine	20.3%
C. Inactive (solar) ultra-violet, from 3,200 to 4,000 Ä.U.	15.9%
D. "Visible" radiation	35.0%
E. Infra-red	10.3%

Among these groups the "Dorno" rays are much the most important in all those therapeutic actions which are associated with the production of erythema; the radiation shorter than 2,800 Ä.U. has much less erythema-producing power, and is largely absorbed in the outermost layers of the skin. It is perhaps worth expanding this point, since it was once not uncommon for writers to speak in terms of "short-ray technique." As Dr. Eidinow well says: "No simple lamp has as yet been designed which emits rays of light containing similar intensity and wave-length to the sun or sunshine." Indeed, physicists tell us it is technically impossible for any lamp to emit radiation similar to sunshine, since no substance on earth can be made to burn at the solar temperature. Yet it would be totally erroneous to ascribe the therapeutic value of the mercury arc solely to rays which are outside the solar spectrum.

Sixteen years ago I stated my opinion that accurate prescribing in actinotherapy was only possible with artificial sources, and provided that an ultra-violet lamp gives the required results, as the mercury vapour arc abundantly does, one is not disposed to care whether it resembles sunlight closely or otherwise. That the short (non-solar) wave-lengths have some value is, however, substantiated by too many clinical observations to be doubted to-day. One of the most recent and interesting tests in this connexion was made by Kovacs (1937), who irradiated two groups of patients suffering from secondary anaemia with (*a*) the complete quartz mercury vapour spectrum, and (*b*) equal amounts of radiation from the mercury arc so filtered that the shorter rays were eliminated. In both groups the production of haemoglobin was increased, but the rate of increase was found to be greater when the complete spectrum was used. Widely different from sunshine in a spectral sense, the mercury vapour lamp is clinically valuable because of its emphasis on the important "Dorno" rays, so deficient in our climate. If its additional (non-solar) radiation adds to its therapeutic value we clinicians may accept that and be grateful.

On the subject of technique Dr. Eidinow's letter leaves the impression that the only dose which is valuable for increasing immunity and resistance is the minimal erythema dose administered on a limited skin area. While I have gratefully quoted Dr. Eidinow's conclusions on this restricted-area dosage in several editions of my book, I equally emphasized—and do so to-day on much greater evidence—the value of exposing the whole body to ultra-violet radiation in minimal or sub-minimal erythema doses. This technique of restricted skin-area doses for tonic effect—as distinct from counter-irritant local actinotherapy, which is a different matter—was originated by Dr. Eidinow fifteen years ago, based upon his experiments on rabbits. He has proclaimed it consistently ever since, and so it has doubtless been extensively tried; yet despite the very widespread use of actinotherapy to-day in public health work, in the Services, and in private practice, the method of general irradiation for tonic effects continues to be the method of choice. Dr. Eidinow has therefore fallen into a very grave *lapse dixit* in his closing remark: "Beneficial results will only be obtained when dosage is accurately controlled by a technique similar to that which I have described as 'short-wave therapy.'" Nobody could support either the terminology or the assertions of this sentence. The term "short-wave therapy" is, of course, now definitely kept for a different form of electro-medical treatment. The beneficial results follow consistently after quite other techniques, not only in the treatment of disease but in what I have described elsewhere as the treatment of health—that is, the use of artificial sunlight for the keeping of health and the prevention of disease. I followed with very close interest the first practical and very successful experiments in this connexion at a colliery and a theatre respectively many years ago, and so can see nothing but good in the very widespread use of tonic artificial sunbaths to-day. As a means of maintaining health among overworked munition makers, overtaxed members of the fighting Forces, under-rested shelter sleepers, and so forth, I can conceive of no other single-measure which could be so beneficial.—I am, etc.,

F. HOWARD HUMPHRIS.

Watermouth Castle, N. Devon, Jan. 2.

Haemorrhagic States with Snake Venom and Lecithin

SIR,—It was with particular interest that I read the article by Prof. L. J. Witts and Miss Felicity C. G. Hobson (December 21, p. 862), since I published recently a paper[1] showing that Russell-viper venom may with advantage be substituted for tissue extract in Quick's method of prothrombin estimation.

I find it difficult to understand the authors' contention that "if venom is used instead of brain extract to measure prothrombin in the Quick test it must be fortified by the addition of lecithin." Their figures do not support this statement, since the values they obtained using Quick's test lie closer to those obtained by the use of venom alone than to those given for venom plus lecithin. This can be clearly seen by plotting their results with Quick's test in Fig. 1.

But an essential condition of Quick's test for prothrombin is that an *optimal* amount of thromboplastin must be added to the plasma. The authors added to 0.1 c.cm. of plasma 0.1 c.cm. of Russell-viper venom in a dilution of 1 in 50,000, whereas I have shown that the optimal dilution of venom in this test is approximately 1 in 10,000. If more dilute venom is used longer clotting times are obtained. The failure of the authors to use an optimal concentration of venom makes it impossible to assess their results with any accuracy. Moreover, they state that in disease of the liver the clotting times with Quick's reagent and venom plus lecithin run parallel. Actually a comparison was made in only one case apart from the patient with "treated jaundice." Lecithin undoubtedly seems to have a potentiating effect on the coagulant action of Russell-viper venom, but the authors have not proved that its use in a test for prothrombin deficiency is desirable.—I am, etc.,

Aberdeen, Jan. 8. HAROLD W. FULLERTON.

Oxygen Therapy

SIR,—It is well on forty years since Pembrey and Beddard first mooted the use of oxygen as a therapeutic measure. To the public its use is associated with impending dissolution, a frantic call for oxygen in a dying relative, the incessant bubbling bottle at the bed of the pneumonic patient, and the inevitable final words of the bulletin presaging the death of some notable personage: "Oxygen is being administered." Even the doctor himself, pardonably a little baffled by the complexity of some of the physiological principles involved, seems reluctant to use it except in some of the final stages of respiratory embarrassment.

Within the last few years, especially with the simplification and perfection of the mask, oxygen therapy has become a measure not only for the heaving struggling chest but also for the living, struggling cell far from this scene. Its great value in shock is accepted, but its hesitant use still indicates that it is reluctantly appreciated. In such conditions as abdominal distension and thyrotoxicosis and post-operatively as a routine following gastric operations it has proved itself. It is by its local effects that it now gives promise to play its greatest

[1] *Lancet*, 1940, 2, 195.

role. We know of it as a valuable weapon in peripheral vascular disease. We know that in any injury—whether it be burns, the bomb splinter, the surgeon's knife, the trauma of the stitch—there must be a number of cells whose survival depends on whether they encounter circumstances most favourable to repair. Any bruised tissue suffers from oxygen lack, and the importance of this is enhanced by the fact that trauma in the neighbourhood of a vessel results in spasm, which limits further the blood supply. The maximum amount of oxygen that can be carried in that now trickling stream is, therefore, of prime importance. By the inhalation of pure oxygen it is known that the oxygen in solution in the plasma, which is normally 0.3 c.cm. per 100 c.cm. of blood, is raised to 2.2 c.cm. The oxygen in combination with haemoglobin is simultaneously raised from 19.2 c.cm. to 20 c.cm. There is thus produced a total increase of arterial oxygen from 19.5 c.cm. to 22.2 c.cm. per 100 c.cm. of blood, an increase of nearly 15%. Of even greater importance than the percentage increase in the amount of oxygen is the rise in its partial pressure in the blood, for it is this that determines its availability to the tissues. In fact, Boothby has shown that in the shocked patient with his low venous oxygen the partial pressure of oxygen in the capillaries may be raised from 14 to 21 mm. Hg—a rise of 50%—by the inhalation of pure oxygen alone.

It is all too common for cyanosis to be regarded as the prime indication for oxygen therapy. In fact, cyanosis does not occur until there is at least 5 grammes of reduced haemoglobin in 100 c.cm. of blood. It follows, therefore, that in haemorrhage, shock, and anaemic states oxygen want may be present long before there is sufficient reduced haemoglobin to give a visible external indication as cyanosis. This established fact, which is of the utmost importance, has not in the past been sufficiently stressed.

Despite reassurance the patient, as he dons the mask, feels that he "must be bad." He is apprehensive, afraid to go to sleep, and is often anxiously restless. The use of oxygen is often postponed, even by the doctor, as he himself is "anxious not to alarm the patient." The education of the public that oxygen inhalation is a therapeutic measure of great value and not a forlorn hope is, therefore, an urgent need.—We are, etc.,

SOL. M. COHEN.
Dartford, Jan. 10. WILLIAM W. MUSHIN.

Adie's Syndrome

SIR,—In the annotation (January 11, p. 58) it is implied that the syndrome referred to under the above title was first identified by Adie. Sixteen years ago I published an account of the condition with illustrative cases at the congress of the Ophthalmological Society of the U.K. (*Trans. ophthal. Soc. U.K.*, 1924, **44**, 38). Adie's first communication was before the same society some six or seven years later: he extended the observations in several particulars, but added no essential point. He suggested the title "myotonic pupil," which has been accepted and is perhaps more appropriate than the more cumbrous one of "pseudo Argyll Robertson" which I had applied to it.

My own notes and books are no longer available, so that I cannot here give the exact references, but I believe I stated them accurately in a previous letter on the same matter published in the *Journal* about six years ago. I may perhaps quote the summary of my observations from the second edition of *Medical Ophthalmology*, which was published fifteen years ago (p. 136). (1) The contraction with convergence, and dilatation when convergence was relaxed, were characteristically slow. (2) None was associated with paralysis of accommodation. (3) All dilated freely with mydriatics. (4) In four out of seven cases they were uniocular. (5) None of the cases was associated with syphilis. (6) The knee-jerks were present in every case. (7) In no case was there evidence of parasyphilitic or any other general nervous disease, even after so long as thirteen, thirty-six, and forty years in three cases I afterwards commented on its preponderance in the female sex.

It will be seen that the condition was recognized and described a number of years before Adie's report of it.—I am, etc.,

Bemerton, Salisbury, Jan. 12. R. FOSTER MOORE.

Some Nutritional Problems of War and Peace

SIR,—In your report of my recent lecture to the Pharmaceutical Society (1940, **2**, 913) I am quoted as having said: "Calcium was known to be essential, but not its quantities. . . ." The report is at fault. Not only did I not make this remark, but I have, along with Prof. Drummond (*J. Soc. chem. Industr.*, 1940, **59**, 37), published our joint views as to marginal and optimal daily requirements for this element. We have there expressed the opinion that for the "average" man of about 10 stone weight the respective figures are 750 and 1,500 mg.—I am, etc.,

Greenford, Middlesex, Jan. 6. A. L. BACHARACH.

The Mobile Unit in Action

SIR,—May we crave your indulgence in asking you to publish yet another letter regarding this important subject. The tendency of the majority of your recent correspondents has been to disparage the use of these units, but close scrutiny will reveal the facts that either your correspondents' experience has been extremely limited or else there has been some gross lack of co-ordination with Control or the other allied services.

We are in charge of the two mobile units attached to the metropolitan borough of Southwark. During the months of September and October last we attended a total of forty-four incidents, excluding the incidents attended only by doctor and nurse. Our average is, therefore, 22 as compared with the average for the country of 4.4. The total number of casualties dealt with was over 200, and in one major incident the two units working side by side dealt with forty casualties, apart from giving morphine to five trapped persons. You will therefore readily appreciate the fact that in this metropolitan (not rural or urban) district the mobile first-aid unit is held in high esteem.

May we also draw your correspondents' attention to another feature which they have apparently overlooked—namely, the "insurance" value of the unit. We are still in the early days of aerial warfare, and all too often one reads of hospitals, first-aid posts, and ambulance stations being destroyed. The mobile unit is invaluable inasmuch as it will in an emergency form the nucleus of an improvised hospital (in conjunction with the mobile surgical unit): it can replace a first-aid post at a moment's notice (we have already had personal experience of this): and, finally, in the event of ambulance transport being overworked or destroyed the unit will go to the casualties instead of their being sent to hospital or a first-aid post.

In view of our extensive experience we would respectfully suggest that the mobile first-aid units are invaluable in the A.R.P. scheme, not only because of what they can do when properly used, but also because of what they might do should the emergency arise—as possibly it might.—We are, etc.,

M. M. SCOTT
London, S.E.17, Jan. 6. H. C. DUNDON.

SIR,—I have been very interested in the letters which you have published recently giving your readers' views and experiences on mobile van duties during air raids. I thought you might be interested in our experiences in Sheffield during the recent raids here.

The van was staffed by nurses and two doctors. The idea of the van was to establish a first-aid post should the local one be destroyed, or to perform any urgent operation such as an amputation should this be necessary to free a person trapped by fallen debris, etc. Our first call was to a case of two casualties at a point distant about two miles from the hospital. We arrived to find that they had been sent to the F.A.P. At the post we were told that one case had been sent to hospital by ambulance and that the other was being given shelter following suture of a simple laceration. The next call was an urgent one to the centre of the city to deal with many casualties. After driving through water, broken tram-wires, and making detours to get past blocked roads we reached our destination to find a ring of blazing buildings and not a person in sight. Bombs were dropping all round, as the light from the fires was so good that one could have read a newspaper. We finally discovered a group of wardens vainly trying to rescue someone trapped under

about twenty tons of debris. We returned, narrowly missing driving into an unexploded bomb crater on our way back. Later we were again called out to a man trapped in a fallen building. This turned out to be genuine. The man was caught by the foot with fallen masonry. We were asked to wait for fifteen minutes while the rescue party attempted to free him. This they successfully accomplished, and the man was sent to hospital by ambulance. The "all clear" went in the middle of the last case.

It seems to me that as it is impossible to verify calls during a raid a mobile van is simply at the mercy of any nervous individual who cares to phone up the hospital direct or the police station. The only sensible solution would appear to be that no mobile unit should be sent out until after the raid is over, as the extremely slender chance of their being able to do any good is completely outweighed by the risks encountered. I may say that it is an experience never likely to be forgotten by any taking part in it.—I am, etc.,

Sheffield, Jan. 11. R. E. MCLACHLAN.

SIR,—Although a mobile first-aid unit under the present circumstances has limited uses if it is not superfluous, there are, I think, three occasions on which a well-equipped mobile resuscitation unit can be of great service. The first two have frequently been encountered round here in the last four months. (1) For casualties under buildings who have been reached by the rescue party but who are still pinned down by the wreckage, fallen beams, etc. (2) For those who have been under wreckage for a long time and come out in such a shocked condition that it is imperative for them to be treated before an ambulance journey can be undertaken. (3) For small towns which suffer a concentrated attack and whose hospital facilities are inadequate to deal with the volume of casualties.

An ambulance with the upper stretchers removed can quite easily be fitted out with the complete apparatus for treating shock. One patient at a time is normally treated in it, but if necessary two can be managed. In the ambulance here we carried eighteen bottles of plasma and a corresponding number of transfusion sets, with half a dozen blood bottles full of sterile citrate for washing out apparatus, and a cutting-down set and accessories. This apparatus could easily be used in the ambulance, and the simplicity of the E.M.S. transfusion set makes it ideal for taking into wrecked buildings and using under difficult circumstances. The morphine is carried in rubber-capped bottles for use with a syringe, and a supply of tubunics is also kept. A 100-cubic-foot cylinder of oxygen was kept under the stretcher for use in the ambulance, and in addition a small portable cylinder was taken for use outside. The interior of the ambulance was heated, and we carried hot tea, rugs, hot-water bottles, and blocks for raising the foot of the stretcher. In addition the usual first-aid surgical equipment was of course carried.

With this type of unit it is only necessary to be called out when conditions (1) and (2) are met with, and not for ordinary casualties, where the quicker they reach hospital the better. And, in addition, one often has several hours' notice as to when the trapped casualties are likely to be reached. Transfusions can be sometimes performed under the wreckage, and those suffering from prolonged exposure can be treated at the earliest possible moment in the ambulance (very often long after the raid is over).

In the case of emergency (3) a large number of bottles of plasma or blood, transfusion sets, blankets, hot-water bottles, and a personnel of half a dozen can be ready to start at an hour's notice to equip and manage a resuscitation ward, where needed, or to help in an overworked hospital.—I am, etc.,

Guy's Hospital, S.E.1, Jan. 9. PETER H. CARDEW.

Second Attack of Cerebrospinal Fever

SIR,—The following brief statement (and request for information) may be of interest to readers.

In February of last year a boy aged 16 was notified as a case of cerebrospinal fever. To-day a report has been received that he is again suffering from this disease. Dr. Edwards of the County Laboratory confirms that on both occasions meningococci in culture were obtained. Dr. Cowan last year kindly supplied me with notes as to the treatment. Serum was given in the early stages combined with sulphapyridine. (Clinical notes and full bacteriological reports have not been recorded in order to save space. They are available if required.)

May I ask: Are two attacks as unusual as my limited experience suggests, and does the prompt use of sulphapyridine prevent the development of immunity?—I am, etc.,

H. B. BINKS,
Stafford, Jan. 6. Medical Officer of Health.

Unification of Shelter Control

SIR,—Dr. Margaret Lowenfeld (January 4, p. 28) accuses me of quibbling about the word "dictator," but, unfortunately, it was used in an editorial heading. It is important that we do not use this sinister term when something else is intended. That the unification of the medical services of the metropolitan area is an urgent necessity no one would deny, and it is what we *must* press for. To believe that either the medical profession or any other body can solve their problems by appointing a "directing mind" or dictator with the same "full authority to act" as the Government already possesses through the Orders in Council is fallacious. Why are the practical and admirable suggestions concerning organization as outlined by Dr. Lowenfeld and other correspondents not immediately utilized?

As numerous solutions of this problem have been suggested by both medical and lay bodies and have hitherto not been put into practice, the medical profession is now confronted with the necessity of deciding where the responsibility lies.—I am, etc.,

Pontypool, Jan. 6. A. S. JARMAN.

Proprietary Names for Drugs

SIR,—In three consecutive issues of the *Journal* (December 21, p. 875, annotation on Rationalization of the British Drug Industry; *Supplement*, December 28, p. 59, Mr. E. Lewis Lilley's article on N.H.I. prescribing; and January 4, p. 33, Dr. R. Forgan's letter) reference has been made to the difficulties created for the medical man by the multiplicity of proprietary synonyms for medicinal substances. But no solution is anywhere suggested for what, after all, is becoming an intolerable state of affairs.

While it is true that many of the larger firms when marketing official substances under proprietary names usually indicate on their packings the English official name of their product, this practice is not sufficiently general to be helpful. But the whole situation could be greatly simplified if the provisions of the Therapeutic Substances Act and Regulations respecting the naming of the substances there dealt with were made generally obligatory—that is, that underneath the brand name on the label must appear the English official name of the substance in letters equally large. This could be extended to include all preparations where the chief active ingredient was an official substance.

A difficulty, of course, arises when it comes to dealing with important substances not yet official, and it is here too that more than simple questions of nomenclature would have to be considered. Is it not high time that in this country we had a body comparable in its aims and functions with the Council on Pharmacy and Chemistry of the American Medical Association and working in close collaboration with the parent body? A substance, whether protected by patents or not, accepted for inclusion in "New and Non-official Remedies" and/or the corresponding British publication could then have chosen for it, by the accepting body or bodies, a "standard" name, which, for the purposes of labels, circulars, and advertisements, would have the same status as an English official name.

The situation would then be such that similar provisions would apply to the use of proprietary names for both "official" and "accepted" substances. The obligatory use of the English official or standard name in all instances would have manifest advantages over an obligation to give only, in addition to the trade name, the chemical description of the product, for this, in many instances nowadays, is too complex to convey anything to the average practitioner, and, in any event, is capable

of such manipulation and variation in its expression as to give more than momentary difficulty even to a chemist

The operation of such a scheme as suggested here would, while maintaining some at least of the supposed advantages of the trade name, remove nearly all its manifest disadvantages. Thus, in the case, say, of an important new chemotherapeutic substance discovered and marketed by a single firm under a trade name, the firm would have all the advantages accruing from both their monopoly and their use of this name, but the medical profession would presumably be so familiar with the standard name by the time the product became official that it would not be worth the while of any firm to devise a new one. The method would then perhaps be generally adopted that, while the firm which gave the world "M & B 693" would continue to give it, the firm of Blank would be content to offer sulphapyridine (Blank), and everyone, including the poor pharmacologist who has to teach about these things, would be satisfied.—I am, etc.,

Jan. 10

W. A. BAIN,
Reader in Pharmacology, Leeds School of Medicine

Robert Burns's Diet

SIR,—In praise of the Scottish ploughman's fare Dr. S. Watson Smith (January 11, p. 63) states that "on this diet Robert Burns, *that prince among poets*, was nurtured, and subsisted all his days." As Burns died at 37 Dr Smith can hardly be accused of overstating his case.—I am, etc.,

Jan. 13

M. NEWFIELD.

Universities and Colleges

UNIVERSITY OF LONDON

Sir Ernest Graham-Little, M.P., has been unanimously re-elected chairman of the Council for External Students of the University of London for the year 1940–1.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the Royal College of Surgeons of England, held on January 9, with the president, Mr. Hugh Lett, in the chair, Surgeon Rear-Admiral G. Gordon-Taylor was appointed Bradshaw Lecturer and Mr L. R. Braithwaite Moynihan Lecturer for 1941.

Mr. Lett was congratulated on having received the honour of a baronetcy.

Dr. Gilbert Orme was reappointed as representative of the College on the Council of the Queen's Institute of District Nursing.

The Hallett Prize adjudged on the result of the recent Primary Fellowship examination was awarded to Jenkin Dillwyn Thomas Jones of the University of Durham.

The posts of the three house-surgeons at the Palmerston North Hospital, New Zealand, were recognized for the six months' surgical practice required of candidates for the final examination for the Fellowship.

The date of Mr. R. E. Smith's Hunterian Lecture on the undescended testicle has been changed to January 23. The lecture will be delivered at the Royal Society of Medicine (1, Wimpole Street, W.), as will all the others announced in this column on January 11 (p. 67). This was omitted by an oversight from the original announcement.

Diplomas

Diplomas in Psychological Medicine were granted, jointly with the Royal College of Physicians of London, to the following candidates:

Margaret MacK. Methven, G. C. Rae, B. A. MacG. Williamson.

L. S. Powell and R. L. Dunlop (*J. Kansas med. Soc.*, 1940, **41**, 432) record two cases of visual disturbance complicating mumps. The first was in a boy aged 11 years who three weeks after the onset of mumps developed severe optic neuritis as well as labyrinthitis. Some improvement took place, but a veil about the vessels at the optic disk and slight pallor of the nerve head persisted. The second case also occurred in a boy aged 11 years, who in convalescence from mumps developed a mild papillitis with paralysis of accommodation. Complete recovery took place.

Obituary

HERBERT TILLEY, M.D., F.R.C.S.

Consulting Surgeon, Ear, Nose, and Throat Department University College Hospital

As announced in our last issue, Mr. Herbert Tilley died on January 6, aged 74. He was born at Shepton Mallet, Somerset, and was educated at Queen's College, Taunton, and University College Hospital. He graduated M.B., B.S. of the University of London in 1890, took the M.D. in the following year, and was granted the diploma of F.R.C.S. in 1898. He was consulting surgeon to the ear, nose, and throat department (Royal Ear Hospital) of University College Hospital and laryngologist to the Radium Institute. In 1931–2 he was president of the Medical Society of London and in 1932 was elected a Fellow of University College. He joined the British Medical Association in 1895, was secretary of the Section of Laryngology and Otology when the Association met at Portsmouth in 1899, was vice-president of the same Section at Ipswich in 1900, and was president of the Section of Laryngology at the London Meeting in 1910.



The passing of Herbert Tilley will evoke profound regret among a large section of the profession, for he occupied during many years an outstanding position in British laryngology. He first practised in Hampstead, an experience which he always regarded as of great value, but soon became interested in laryngology, and was appointed to the staff of the Throat Hospital in Golden Square. When a department for diseases of the throat and ear was established at University College Hospital he was appointed to take charge of it, and it was to the welfare and development of that department that he thereafter devoted his time and energy unsparingly. The department, which eventually became amalgamated with the Royal Ear Hospital and, by the liberality of Geoffrey Duveen, is housed in a carefully designed building adjacent to University College Hospital, was his special pride. He took up the study of laryngology at a period of very active progress, when development was proceeding in almost every direction, and his own contributions were mostly in connexion with the pathology and surgery of the accessory sinuses of the nose. He wrote much about this, especially in the later editions of a book of which the first had come from Dr. de Havilland Hall, whilst the fourth and last edition, so much revised and expanded as to be almost a new book, came from himself alone. Finally, in 1934, he gave a final exposition of his views on the pathology of sinusitis in a Semon Lecture, which was filled with original clinical observation and wisdom. This work established his reputation both on the Continent and in the United States, so that besides having the unusual distinction of being president of both the Section of Laryngology and the Section of Otology at the Royal Society of Medicine, he received the rare honour of admission to that exclusive body the American Laryngo-

experience, for he counted all the leading Continental laryngologists among his friends and his friendly generous character attracted everyone.

There is one activity by which probably he would particularly wish to be remembered, and that is his long connexion with the Semon Lecture Board. When the lectureship was founded by Sir Felix Semon with the fund subscribed for him by his friends and colleagues, it was placed in the care of the University of London, and the university wisely—sometimes officially and sometimes unofficially—committed it to the charge of Tilley. With such discretion did he discharge this trust that the reputation of this lectureship stands very high. He himself spoke of it once as the blue riband of laryngology, and it was due to him that it could be so described. It was characteristic of him that for many years he persistently refused to deliver the lecture himself on account of his connexion with the management, and it was not until 1934 that his scruples were finally overborne by the vehemence of some younger colleagues.

Tilley easily attracted round him in his clinic keen workers, to whom he was kind and generous, and many of these hold important positions elsewhere. Much of his work is of permanent importance, especially that on the accessory sinuses and on the prognostic significance of a fixed vocal cord, but, above all, he will always be remembered as the perfect colleague.

Sir STCLAIR THOMSON writes:

Herbert Tilley, although not one of the founders, was certainly one of the early builders of British laryngology. He was also one of the very few survivors of the period, at the end of last century, when those who devoted themselves to a special subject had first been trained in the hard apprenticeship of general practice. This was all to their own and their patients' benefit, particularly in the art and humanity of clinical medicine. It is no longer possible owing to the length of years now required for becoming acquainted with technical details of the many methods of scientific investigation. Tilley was in general practice in the neighbourhood of Swiss Cottage when he joined the staff of the small Throat and Ear Hospital in Great Portland Street, now extinct. Fortunately he already possessed the diplomas of M.B. and B.S.Lond., as well as the F.R.C.S., which qualified him not only for aspiring to the staff of larger hospitals, but fitted him for the work he was to do in the surgical field of laryngology, which was only then beginning. Before his day the pioneers of laryngology were generally, like Sir Morell Mackenzie, Semon, and de Havilland Hall, physicians. His next step was to the Throat Hospital in Golden Square, to which I had the good fortune of being elected his colleague at the same time. He resigned this appointment when chosen as the first specialist of otolaryngology in his old school, University College Hospital, a department of which he may be regarded as the founder, where he had a long and distinguished career in a school he served loyally.

His contributions to investigations and literature extended over the whole field of his special subject, and, particularly in the clinical field, were all trustworthy and bore evidence of his extensive experience. Perhaps his best work was that on paranasal sinuses, in which he was a leading pioneer at a time when that area was still a *terra incognita*. He laid the foundation of it by his investigations into their anatomy, and the value of his clinical work was much increased by his honesty in publishing the disasters which were known to occur in the hands of many of us forty years ago. The value of his careful note-taking was apparent in his records of the occasional spontaneous disappearance in some cases of what appeared to be established sinus suppuration, and also in his reports of the changes sometimes seen in the after-histories of certain cases of paralysis of the recurrent laryngeal nerve. His intimate knowledge of laryngeal cancer, dating from the early days of laryngofissure, led him to favour the idea that there might be a constitutional tendency to cancer. The occasional reappearance of this disease, not in exactly the same area, and sometimes after a free interval of five or even ten years, was more certainly regarded by him as suggesting evidence of a local predisposition to recrudescence (as apart from recurrence) in the larynx and pharynx. Tilley's writings were clear and readable, and his contributions in debate showed clear thinking and lucid explanation, and were made more welcome by his distinct articulation and diction.

This wide and thorough knowledge of his work, with an attractive personality and a sympathetic nature, secured for him a large and enduring practice. The trust he inspired was also shown by the frequency with which colleagues consulted him when they themselves required advice in his department of practice. I have myself grateful recollection of his sympathy when seriously ill nearly forty years ago. Tilley was blessed with a devoted wife, who shared in his tastes and his sports. To both of them it was a regret that they had no children to join in their happy companionship. For both of them age, as too often happens, brought its clouds. The chronic illness of his wife was a grief to him. His own health had been threatened for some years, and the difficulties of wartime and the devotion and care for his beloved companion made the strain too great for his diminished resistance. Tilley will be sadly missed by his fellow workers: he was a friend to all of them.

[The photograph reproduced is by Elliott and Fry, Ltd.]

E. D'ARCY McCREA, F.R.C.S., and EDITH F. W. McCREA, F.R.C.S.I.

We deeply regret to record the tragic deaths through enemy action of Mr. E. D'Arcy McCrea and of his wife, Dr. Edith F. W. McCrea. They were killed and their two children with them during an air attack on Manchester.

Mr. D'Arcy McCrea qualified M.B., B.Ch., B.A.O., Dublin, in 1917; three years later he took his M.D., and in 1922 the M.Ch. and the F.R.C.S.I. In 1926 he took the F.R.C.S.Eng. While still in Dublin he was assistant surgeon to Sir Patrick Dun's Hospital. At the time of his death he was honorary consulting surgeon, Eccles and Patricroft Hospital, Manchester, and honorary surgeon to Salford Royal Hospital.

We are indebted to Mr. J. B. Macalpine for the following account of his life and work.

D'Arcy McCrea qualified in Dublin in 1917 after a brilliant student career in which his name appeared many times in the prize lists. In due course he was appointed to the staff of Sir Patrick Dun's Hospital as an assistant surgeon. Almost immediately, however, the political atmosphere of South Ireland became unfavourable to one who was not of the Roman Catholic faith, and McCrea determined to seek his fortunes elsewhere. It was then that he joined me as registrar in the urological department of the Salford Royal Hospital. From about 1922 to the present time I have enjoyed an association and collaboration which continued quite unclouded by any misunderstanding until rudely broken by this tragedy. In due course McCrea gained a place on the assistant surgical staff of the Salford Royal Hospital, and for the last few years had been on the full staff. As a lieutenant he was a most loyal and willing helpmeet, careful, painstaking, and reliable in his routine work, and always willing and anxious to take up a new problem and capable of following it intelligently and studiously. In his earlier days he did much admirable work on the musculature of the bladder, especially of the bladder neck, subjects of which the difficulties are well known. He applied himself also to many questions concerned with the physiology of that organ, working out some of them in the physiological department of the Manchester Medical School, and also making contributions to the literature on the indications for presacral neurectomy in disturbances of bladder function. For the last ten years McCrea's principal interests

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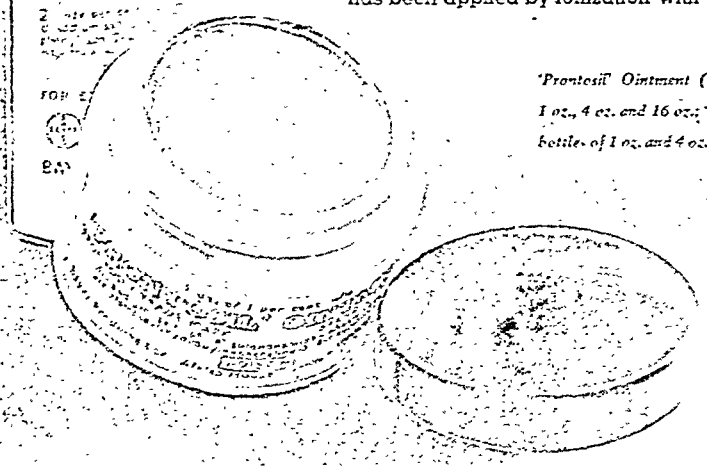
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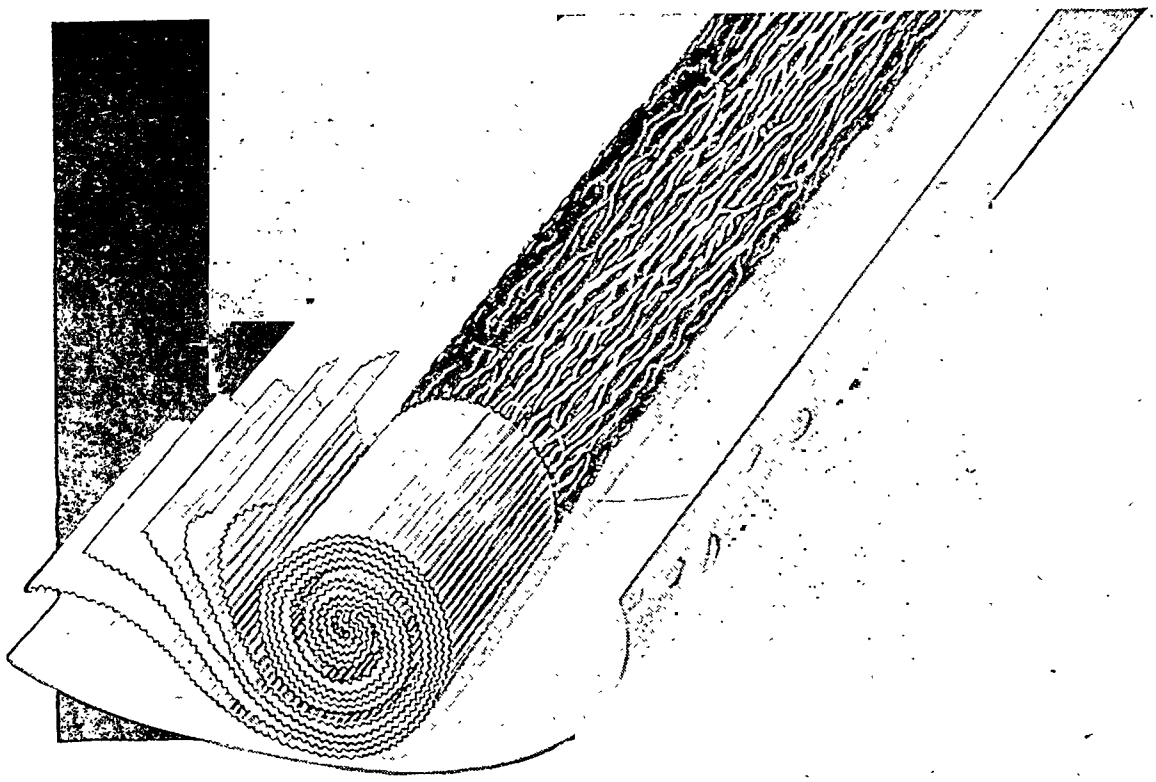
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were in diseases of the male genital tract, a subject on which he had accumulated a big fund of knowledge and an exceptionally large clinical experience. It was his intention to produce a series of monographs on this branch of surgery, and the book on diseases of the urethra and penis published so recently as May, 1940, was but the first of these. The work on other sections was well advanced, and I know that a great amount of unusually rich material, particularly that referring to disease of the testicle, has most unfortunately been lost, together with pathological specimens collected over many years and numerous drawings of their macroscopical and microscopical features. The book mentioned has been more than well received, but I know that subsequent sections would not have fallen behind the standard already set. So much valuable material lost is lamentable, but its loss pales beside that of the life thus wantonly and cruelly destroyed—a life which showed much accomplished, yet more waiting to be garnered.

McCrea was not a club man nor one who went out much in society. Few knew him intimately. Rather reserved and possibly shy, his interests were in his home and his family, and he was a voracious reader. Yet he enjoyed good conversation and meeting men of similar interests, as, for instance, at the dinner of a scientific society. Twenty years ago he became the first string in the Irish lawn tennis team, and on coming to Manchester was a regular member of the Lancashire team. He was a formidable singles player, and when representing Ireland in the Davis Cup it was his lot to face the redoubtable Tilden. However, he took a handful of games from his opponent, and the latter is credited with the remark that "had McCrea not been so keen on surgery he might have become a world beater."

Dr. Edith F. W. McCrea qualified B.A., M.B., B.Ch., B.A.O., Dublin, in 1921. She took her D.P.H. in 1922 and in 1925 the F.R.C.S.I. She was honorary surgeon to the Manchester Babies' Hospital, surgical registrar and surgical assistant, Ancoats Hospital, and surgical assistant, Stretford Hospital, Manchester. A colleague writes:

Edith McCrea was clear-cut, physically and mentally, and her heredity, training, and environment were sharply etched in her personality. The daughter of an able Anglo-Irish family, her father an Indian Civil Servant and her aunt, Miss Sophie Bryant, one of England's best-known educationists, she was trained at Cheltenham College and Trinity College, Dublin. Coming to Manchester after a career distinguished both academically and in the field of sport, she became resident medical officer at the Manchester Babies' Hospital. Intent on surgery, she took the F.R.C.S. Ireland, and later was appointed honorary surgeon at the same hospital. She also worked at Ancoats Hospital and the Stretford Memorial Hospital. She was a quick and accurate worker and a precise writer. We know that she was about to publish a paper on pyloric stenosis, the outcome of many years of careful preparation, but we fear this may have been lost in the raid. Intolerant of those she considered fools, she had a smile and charm that won her way, and with children she was delightful. She was the devoted mother of two children, who were already showing that they had inherited their parents' ability.

ANDREW TRIMBLE, M.B., B.CH.

The death of Dr. Andrew Trimble, former Chief Tuberculosis Officer for Belfast, removes a prominent and popular member of the medical profession in Ireland.

Andrew Trimble, who was born at Dungannon in 1867, graduated M.B., B.Ch., B.A.O. at the old Queen's College, Royal University of Ireland, in 1895, and was in general practice for several years. He took his D.P.H.Belf. in 1910. He had the distinction of being the first Chief Tuberculosis Officer for the city of Belfast, a position which he filled with ability for upwards of a quarter of a century. During this time he saw the death rate from consumption fall from 209 to 78 per 100,000. While still a young man he was elected to the council of the county borough of Belfast, and in this capacity took a keen interest in the activities of the public health department and in the local administration of the Children's Act. His main interests in life were the education of the public in health matters and the welfare and health of children, for whose benefit he established in Belfast an open-air day school, the first of its kind in Ireland. In 1925 Dr. Trimble made a special journey to Switzerland to investigate Spahlinger's work. He also visited Prof. Moelgaard at his laboratory in Copenhagen, and there obtained the first supplies of sanocrysin for experimental use in Belfast. In 1928 he was one of those chosen by the Joint Tuberculosis Council to visit Canada to report upon the progress of the research work there. He also went to the United States on two occasions to learn the latest developments in the diagnosis and treatment of this disease.

Dr. Trimble was a man of diverse interests and catholic tastes. It would be difficult to find a medical man who got through more intensive medical reading, yet he took a keen delight in the literature of history, biography, and archaeology. He toured Europe, and visited the ruins of Troy, ancient Babylon, the Pyramids, and Palestine. He was associated with a large number of social and philanthropic bodies, and was noted for his generosity and charity to the many services and works in which he was interested. He was a member of a number of medical societies, and had held high office in some of them. When the British Medical Association met at Belfast in 1937 he was vice-president of the Section of Tuberculosis. He was well known at tuberculosis conferences, where his views were always heard with interest and respect. A prominent medical officer of health said of him: "I have known him for almost thirty years, and from the first time I met him I regarded him as a man of unparalleled gifts: I have never changed that opinion." He was much loved, and will be greatly missed by his former colleagues and staff at the tuberculosis institutes.

EDGAR OLIVE TURNER, M.B.

We regret to record the death of Dr. Edgar O. Turner of Great Missenden at the age of 74. Dr. Turner was educated at University College in the old Gower Street days, and from there he went to University College Hospital for his medical training, working under Sir Thomas Barlow. He qualified M.R.C.S., L.R.C.P. in 1888, and in the following year M.B. with honours. In 1894 he started practice in Great Missenden and soon became a great favourite in the district, remaining in actual practice there for nearly fifty years. His chief endeavour seemed to be to lighten the burden of those with whom he came into contact: he was regarded by his patients as their friend and confidant as well as their doctor. Turner was deeply inspired by the Christian faith and was a churchwarden for many years. His local activities included that of Justice of the Peace for Bucks and chairman of the Parish Council for over forty years. There was no more loyal member of the B.M.A., to which he had belonged for forty years, he was president of the South Midland Branch in 1922–3, a representative in the Representative Body from 1926 to 1932, a member of the Central Ethical Committee and its Standing Subcommittee from 1919 to 1921, and a member of the Central Council from 1918 to 1924. He was also a representative on the Bucks Insurance Committee. By nature kind and sympathetic, he will be sadly missed by all who knew him.

We regret to record the death on November 18, 1940, of Dr. HENRY LATHAM of Worthing at the age of 70. Dr. Latham was educated at the University of Edinburgh, where he graduated M.B., C.M. in 1892. After short periods at Malvern, Stockport (where he was visiting surgeon to the local infirmary), Hassocks, and Fleetwood he settled in practice at Peterborough in 1899 and remained there until 1924, during which time he was honorary physician and senior anaesthetist to Peterborough Infirmary, and medical officer and public vaccinator for the Peterborough district of the Peterborough Union. In 1935 he moved to Worthing. He had been a member of the British Medical Association for thirty years.

We regret to record the death at Devonport on December 4, 1940, of Dr. GEORGE FREDERIC GLINN at the age of 75. Dr. Glinn received his medical education at St. Mary's Hospital, and qualified M.R.C.S., L.R.C.P. in 1889. After a short period at Devonport he went to live at Bicester, where he practised for some seven years. In 1900 he settled in practice at Camden Square, London, where he remained until last year. He had been a member of the British Medical Association for thirty-nine years, and was chairman of the old St. Pancras and Islington Division in 1910.

We regret to announce the death on December 12, 1940, at the age of 67, of Dr. EDWIN GARRETT BUNBURY. Educated at Wellington College, Bunbury then went to Cambridge University, completing his medical education at Bristol; he qualified M.R.C.S., L.R.C.P. in 1898. After holding the appointment of resident medical officer at Clifton Dispensary he was in practice for some years at the Lizard and Mullion, Cornwall. He saw service in the last war for two years in France as a captain in a field ambulance, at No. 30 General Hospital, Calais, and at another base hospital at Etaples. He then practised for four years at Colsterworth, Lincolnshire, before going to Thorverton, Devon, where he was in practice for fourteen years until he retired to Ottery St. Mary in 1939. A wide circle of Dr. Bunbury's former patients in the rural district of Thorverton will mourn the death of one who had long been a welcome visitor as general adviser and friend as well as doctor, for though of a modest and retiring disposition he obviously loved the country folk, and was for many years chairman of the British Legion at Thorverton. He was a member of the British Medical Association for thirty-five years, and was a most regular attender at all its local meetings and those of the Devon and Exeter Medico-Chirurgical Society. He leaves a widow, a daughter, and a son now in the R.A.F.

DR WILLIAM SAVILL HENDERSON, who died at Parkstone on December 17, 1940, was the son of the late Mr. Gavin Henderson of Liverpool. He qualified M.B., Ch.B. of the Victoria University of Manchester in 1899, and in the same year took his M.R.C.S., L.R.C.P. In 1906 he obtained the M.D. of the University of Liverpool. His resident posts included those of house-surgeon and house-physician at Liverpool Royal Infirmary, he was also assistant demonstrator of physiology and anatomy at the Liverpool School of Medicine, and a Gee Fellow in anatomy at the school in 1900–1. He was in practice in Liverpool until 1919. In the following year he became medical officer of health to the Helston Rural District and medical officer and public vaccinator for the fourth Helston district. In 1923 he moved to Taunton and in 1926 was appointed medical officer to Sedbergh School, a post he held until 1928, when he moved to Paddock Wood, Kent. He went to Manchester in 1935. He had been a member of the British Medical Association for thirty-six years.

DR. ROBERT GEE STERLING, who died suddenly after a long illness on January 3 at his home at Ash Vale, near Aldershot, was the son of the late Canon Robert Sterling, M.B., B.S.Durh., founder of the Church Missionary Society's Hospital in Gaza, Palestine. Dr. Sterling qualified M.R.C.S., L.R.C.P. from the London Hospital in 1915, and served as a captain in the R.A.M.C. from 1916 until the end of the war, principally in Palestine. At the close of hostilities he, with his young wife and family, returned to Gaza and rebuilt the mission hospital, which had been bombed by the British during the occupation of the town by the Turks, who were using the premises as an ammunition store. The hospital was renamed the Sterling Memorial Hospital in memory of Dr. Sterling's father. Dr. Sterling remained as medical superintendent of the hospital in charge of the 150 beds until a serious illness overtook his wife and he was obliged to return to England. For the past ten years he has been in practice at Ash Vale, where his straightforwardness, devotion to his work, and untiring efforts endeared him to a wide circle of friends, colleagues, and patients. He was a staunch supporter of the British Medical Association, which he joined in 1929, and was a member of the executive committee of the Guildford Division from 1935 to 1938, and vice-chairman of the Division 1938–9. Dr. Sterling is survived by his wife, the daughter of the late Rev. Greenway of Eldon, Co. Durham; they had three sons and three daughters.

DR. JOHN STRATFORD HALL, who died recently at Sheffield at the age of 70, was the son of Anthony Hall of Binchester Hall, Bishop Auckland, and came of an old seafaring family. He qualified M.B., B.S.Durh. in 1892, subsequently taking the B.Hy. in 1897. He began practice in the Manchester area, but in 1907 he went to the Hillsborough district of Sheffield. In 1914 he joined up, and the following year went to France, where he was rather badly gassed. He then became sanitary officer of camps at Belton Park and Harrowby. After the war he returned to general practice. His patients were to be found in both town and country, but his heart was obviously in the country part of his practice. As might be guessed from his heredity he possessed individuality and personality; his kindly, cheery manner was a great help to his patients, in whose service he never spared himself. To the last he was keenly interested in the progress of medicine and surgery. He was a great reader and always carried some books about with him in his car, so that he could, if he had half an hour to spare, draw the car up in some corner of the moors or valleys which he loved and sit down and read. He was one of the best-read medical men in the district. During the last few months, in spite of ill-health due to a failing heart, he not only carried on his practice but was able to attend medical boards; he enjoyed the opportunity which this work gave him of meeting his colleagues. He was also in charge of a first-aid post. For many years he was doctor to the Cripples' Home at Loxley. He had been a member of the British Medical Association since 1908. His loss will be regretted by many patients and colleagues.

DR. PATRICK JOHN CARROLL, who died on January 4, was educated at Queen's College, Cork, where he was a senior scholar, and graduated M.B., B.Ch., B.A.O. of the Royal University of Ireland in 1902. During the war of 1914–18 he served in the R.A.M.C. as a lieutenant. He had been in practice in Manchester since 1909, where he was a well-known and popular member of the profession. He joined the British Medical Association in 1926.

A neurophysiological section has recently been added to the Carolinian Medical Institute in Stockholm, Sweden's principal medical school. It is under the direction of the Finnish-Swedish scientist Prof. Ragnar Granit, a pioneer in and an international authority on electrophysiology. Prof. Granit has taken with him from Helsingfors electrical and optical precision instruments, partly acquired or designed with means contributed by the Rockefeller Foundation. The rooms in which the new section is housed have been specially prepared so that when weak "action currents" in the cells investigated have to be amplified there shall be no interference from outside. Included in the equipment of the new section are two spectrophotometers and their amplifiers and several cathode-ray oscillographs.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The incidence of measles and whooping-cough increased during the week, the present levels being the highest so far recorded in 1940. Although the incidence of diphtheria has fallen slightly, as in the previous week, the severity of the disease is causing anxiety. A high incidence of non-fatal cases of diphtheria might prove an advantage in the long run, as the mass immunity would thereby rise rapidly. A safer, cheaper, and less unpleasant way to achieve immunity, whether in the individual or in the herd, is to inoculate non-immunes with one or other of the antigens now available. The possible effect of evacuation on the incidence of diphtheria may be considered from notifications for the corresponding weeks of 1940, 1939, and 1938 for the largest towns: Birmingham 32, 11, 20; Liverpool 73, 32, 57; London 46, 25, 173; Manchester 18, 10, 29; Edinburgh 34, 9, 13; Glasgow 146, 45, 81; Belfast 22, 16, 11. Although the incidence in London and Manchester is higher at present than in the previous year it is much lower than in the last "normal" year, 1938. On the other hand, in the other large towns the incidence at present is much higher in some instances approximately three times higher than in 1938, while the percentage of cases proving fatal is even greater. The figures for the various administrative districts suggest that the high incidence in the country as a whole is due to spread in the densely populated areas (from which an appreciable proportion of the presumed non-immunes have been evacuated), and not, as might have been expected, to the appearance of diphtheria in epidemic form in the reception areas, despite reports of such outbreaks in some quarters. During the week under review the counties more heavily infected were: Lancaster 235 (Liverpool 73, Manchester 18, Bootle 14, Fleetwood M.B. 10, Huyton with Roby U.D. 10); Glamorgan 125 (Swansea 39, Merthyr Tydfil 15, Cardiff 11), Devon 92 (Plymouth 58, Brixham U.D. 6, Newton Abbot R.D. 4, Exeter 4); Yorks, North Riding, 79 (Middlesbrough 68); Durham 78 (Jarrow M.B. 15, Sunderland 13, Gateshead 10, Stockton-on-Tees M.B. 9); Gloucester 54 (Bristol and Gloucester 23 each); London 46; Chester 44 (Birkenhead 12, Stockport 9); Leicester 44, of which 29 were in the city.

Quarterly Returns Ended September 30, 1940

Eire.—During the quarter 14,358 births were registered, of which 7,318 were males and 7,040 females, corresponding to a rate of 19.4 per 1,000 of the estimated population. Illegitimate births represented 3.1% of the total births. Deaths numbered 8,530 (4,400 males, 4,130 females), equivalent to an annual rate of 11.5 per 1,000 and 0.2 below the third quarter of the previous year. The infant mortality rate was 50 per 1,000 births registered, compared with 52 in the previous year. The principal infectious diseases accounted for an annual death rate of 0.4 per 1,000; the mortality from typhoid fever, measles, scarlet fever, and diphtheria fell, but rose for whooping-cough and diarrhoeal diseases in children under 2 years. Deaths from puerperal causes were represented by a rate of 2.9 per 1,000 births registered (0.4 for puerperal infection and 2.5 for other puerperal causes), being 0.2 lower than in the third quarter of the previous year.

Northern Ireland.—There were 6,334 births (3,254 males, 3,080 females) during the quarter, equivalent to an annual rate of 19.5 per 1,000 estimated population, and 0.1 below that for the third quarter of 1939, and 0.6 below the average for the third quarters of the five years 1935–9. Illegitimate births formed 4.5% of the total births registered. Deaths numbered 3,759 (1,921 males and 1,838 females), corresponding to an annual rate of 11.6, and 0.2 above the rate for the corresponding quarter of 1939. Infant mortality for the quarter was 76 per 1,000 births, compared with 55 for 1939 and an average of 61 for the preceding five years. The principal infectious diseases accounted for 0.76 of the total death rate recorded, compared with 0.51 in the corresponding quarter of 1939. Increases in deaths were recorded from diphtheria, scarlet fever, whooping-cough, measles, enteric fever, and diarrhoeal diseases in children under 2 years of age, but deaths from influenza were nearly halved.

No. 50 for 1940

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended December 14, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Birth and Deaths, and of Deaths recorded under each infectious disease, are for (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1940 (a)	1940 (b)	1940 (c)	1940 (d)	1940 (e)	1939 (Corresponding Week) (a)	1939 (b)	1939 (c)	1939 (d)	1939 (e)
Cerebrospinal fever	169	15	55	—	6	25	1	5	2	—
Deaths	..	3	3				1	—		
Diphtheria	1,392	46	455	40*	42	263	25	192	55	25
Deaths	53	2	12	1	2	15	—	7	2	4
Dysentery	75	2	35	—	—	33	1	33	—	—
Deaths	..		—	—	—			1	—	—
Encephalitis lethargica, acute	1	—	1		—	3	—	—		—
Deaths	..	—	2				—	—		
Enteric (typhoid and paratyphoid) fever	19	—	3	5	2	16	2	6	3	1
Deaths	..	—	—	—	—	—	—	—	—	—
Erysipelas	..	361	52	5	4			57	9	6
Deaths	..	—	—				—	1		
Infective enteritis or diarrhoea under 2 years	40	—	10	9	4	22	4	12	6	2
Deaths	..									
Measles	15,278	299	3674		5	2,245	8	23		66
Deaths	.. 12	—	1	1	—	—	—	—	—	2
Ophthalmia neonatorum	76	4	17		—	78	3	24		—
Deaths	..									
Pneumonia, influenzal:	866	66	15	3	9	450	18	5	—	21
Deaths (from influenza)	.. 33	8	3	—	1	25	4	4	1	1
Pneumonia, primary	..		196	20				162	6	
Deaths	..	37		16	10		—		13	8
Polio-encephalitis, acute	1	—				1	—			
Deaths	..	—					—			
Poliomyelitis, acute	10	—	5		—	4	—	1		1
Deaths	..	—	—				—	—		
Puerperal fever	2	2	12	1	1	—	—	12	—	1
Deaths	..	—					—			
Puerperal pyrexia	110	5	17		1	152	10	20		4
Deaths	..									
Relapsing fever	—	—			—	—	—			—
Deaths	..									
Scarlet fever	1,546	69	242	77	42	1,153	36	177	69	93
Deaths	.. —	—	1	—	—	1	1	1	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths	..	—	—	—	—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths	..		—	—	—			—	—	—
Whooping-cough	2,505	30	2054		21	1,072	7	23		11
Deaths	.. 10	—	3	4	—	—	—	—	—	—
Deaths (0-1 year)	311	18	68	45	17	316	34	55	32	22
Infant mortality rate (per 1,000 live births)	..									
Deaths (excluding stillbirths)	5,682	957	724	217	156	4,754	731	676	207	147
Annual death rate per 1,000 persons living	..		14.6	14.5	13.7			13.7	13.9	12.9
Live births	4,558	293	801	295	199	5,340	697	754	342	179
Annual rate per 1,000 persons living	..		16.2	19.7	17.4			15.9	23.0	15.9
Stillbirths	157	12	40			224	21	30		
Rate per 1,000 total births (including stillborn)	..		48					37		

* 1 case mixed infection diphtheria and scarlet fever.

† Notification in certain administrative areas only.

‡ Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

§ Since January 1, 1940, figures for London (b) have been for deaths from all forms of pneumonia; the corresponding figures for 1939 relate to deaths from lobar pneumonia only.

Medical News

A meeting of the Shaftesbury Military Hospital Medical Society will be held at the hospital on Tuesday, January 21, at 3 p.m., when Major-General Priest will give an address on "Cerebrospinal Meningitis."

Mrs. Neville-Rolfe, Secretary-General of the British Social Hygiene Council, has been awarded the Snow Medal for 1941 by the American Social Hygiene Association. This medal is given for "distinguished service to humanity," and is named after Dr. Snow, the first Director of the American Association, which was formed in 1913. Mrs. Neville-Rolfe is the fourth recipient of the medal and the first woman to be so honoured.

There are shortly to be shipped to this country the entire equipment of the hospital and laboratories and the complete medical and nursing staffs of the American Red Cross Harvard Hospital for Infectious Diseases. Harvard is providing the medical staff, the laboratory equipment, and $100,000 a year towards the financing of the venture, while the American Red Cross is giving a sum of $300,000, as well as the hospital itself, its equipment, and the nursing staff. Dr. John E. Gordon, Professor of Preventive Medicine and Epidemiology at Harvard University and Director of the Hospital, has already arrived in this country from Lisbon.

Two further instances of American generosity have come to our notice this week. The American Red Cross have bought for this country sufficient material for the preventive inoculation of 1,000,000 children against diphtheria. This was done in response to an appeal from the Ministry of Health through the British Red Cross, and part of the consignment is being hurried here by Clipper. The remainder is to follow by sea. The third instance concerns a tablet containing vitamins A, B, C, and D, flavoured with sugar and cinnamon, which is being manufactured under the direction of six New York physicians. The British-American Ambulance Corps is raising funds to send to England 9,000,000 of these tablets this year, sufficient for 4,000 children to take six tablets each daily. The first consignment has already left New York.

To avoid overlapping, states the *Times*, and to ensure that the sending of medical and surgical supplies, doctors, and nurses from the United States to this country will be regulated according to need, the British Government has decided that all requests made on its behalf shall be directed through the British Red Cross Society solely to the American Red Cross. Any offers of assistance of this kind received by the Government from American organizations will be referred in the same way.

The Royal Society of Medicine (1, Wimpole Street, W.1) intends to publish in the December number of the *Proceedings* the two discussions which were held recently at the Society's house, one by the Section of Medicine on "Traumatic Haemothorax" and one by the Section of Surgery on "Chest Injuries." The two discussions will be issued as a combined reprint at 2s. per copy. As the number is limited early application is advisable.

The exemption from key industry duty of all articles at present exempt, except dial, chinoline, dinitro-orthocresol, ethyl orthoformate, and metaldehyde, has been renewed until June 30, 1941.

At the suggestion of the Minister of Health, Lord Horder, accompanied by one of the Ministry officials, has visited a number of provincial centres at Bristol, Manchester, and Liverpool in order to assist the regional and local authorities on shelter matters.

Prof. A. Einstein, who has been professor of theoretical physics in the Institute for Advanced Studies at Princeton since 1933, has been admitted to American citizenship.

Prof Angel H Roffo has been appointed incumbent of the new chair of "cancerology" established at the faculty of medicine of the University of Buenos Aires.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be addressed to the Secretary.

TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London;* SECRETARY, *Medisecra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Income Tax

Allowance of Subscriptions

"G. L. H." inquires if the refusal to admit a claim for deduction of B.M.A. subscriptions is correct.

*** Such subscriptions are allowable if the earnings are assessable under Schedule D—i.e., as the profits of independent professional work—but if they are assessable under Schedule E, as the profits of "employment," they are allowable only if membership of the Association is a condition of the employment. As a result of this rule they would apparently be inadmissible in the case of employment under the Crown.

House in Hands of Caretaker

"B. J." maintained a house which was in charge of a non-resident caretaker. He placed a board in the garden stating that he was away doing special work but that messages put through the letter-box would be forwarded. Can he claim a deduction for the rent, telephone, etc., of that house?

*** We fear not. The amount of professional use to which the premises were put in such circumstances hardly justifies the claim that they were occupied professionally.

Assessment of Partnership

"A" and "B" have been in partnership for many years; and have been assessed separately for their net shares of the profits. This year a single assessment has been made on the firm, and when one partner sent a cheque for his share of the tax the collector returned it saying it could be accepted only on the understanding that if the other partner defaulted he would be responsible for the whole amount.

*** The profits of a partnership are assessed by law in one sum on the firm, and the old practice of assessing the partners separately was legally incorrect. The collector's action, however, seems unnecessarily irritating in the circumstances. In theory the junior partner should pay his cheque into the firm's account or to the senior partner, and the latter should discharge the firm's liability.

Treatment of Gastric Flatulence

"B. A. J." writes: I should be grateful for any suggestions as to treatment or diet in the case of a woman aged 47 who suffers from gastric borborygmi. These "rumblings" occur at all times of the day, both before and after meals, and cause her some embarrassment and mental distress. Otherwise she is quite a normal healthy woman and has no other gastric symptoms. Ordinary routine treatment for flatulence by alkaline powders, charcoal, etc., has so far made no difference to the condition.

Dysmenorrhoea

Dr. A. A. LOESER (London, W.1) writes: In reply to "Country Practitioner" (December 28, p. 924), as the patient has to work I would recommend very strongly a subcutaneous implantation of 25 mg. of oestrone or oestradiol. This implantation takes only a minute to perform, and can be done in the doctor's own surgery.

LETTERS, NOTES, ETC.

Diphtheria Incidence

Dr. R. M. COURTAULD (Earls Colne, Essex) writes: Will an immunologist or a statistician kindly explain how it comes about that, in spite of all the Schick-testing and immunizing that have been done, the diphtheria incidence, as shown by the figures given week by week under "Infectious Diseases and Vital Statistics," is considerably higher than it was at the corresponding time last year?

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY JANUARY 18 1940

THE PROTECTION OF PRACTICES SCHEME IN OPERATION

Now that schemes for the protection of practices of doctors who are absent on Service have been in operation for a full year it is considered that the following account, which has been sent to us from Gateshead, an area in which there has been no large influx or evacuation of the population, may be of interest.

The Gateshead Divisional area consists of two parts for the purpose of the scheme, defined by the boundary between the Gateshead Borough and Durham County Insurance areas. The former area comprises mixed practices equally made up of private, National Health Insurance and Public Medical Service patients. The latter area consists entirely of colliery practices with large cohort lists. The actual administration for the county area has been in the hands of the clerk to the County Insurance Committee, who directs the County Bureau, which controls the scheme in the rural areas of the whole county. In the Gateshead Borough area the administration is in the hands of two subcommittees of the Emergency Committee, one the Insurance Bureau, consisting of the chairman, vice-chairman and secretary of the Emergency Committee and the clerk to the Insurance Committee, and the other the Private and P.M.S. Bureau, consisting of the above members of the Emergency Committee and the secretary of the Gateshead Public Medical Service.

The actual scheme follows very closely the British Medical Association's Model Scheme, and of sixty-two doctors practising in the area sixty-one have signed the necessary agreement. The practitioner who is a non-signatory is in an outlying practice in the county area. Of thirteen doctors practising in the county area three are on Service. The deputy system has been adopted, and as the absent practitioners are in all cases partners no actual pooling of practices has been necessary. Payment for N.H.I. transfers from practices where a partner is an absentee has been made at the rate of half the ordinary N.H.I. capitation fee to acting and absentee practitioners. Expenses have been a primary charge of 5% on all moneys handled by the Bureau—for example, the N.H.I. cheques payable to a partnership on behalf of the absentee partner. Because of the nature of the practices the actual adjustment of moneys between the acting and absentee practitioners has been very small.

In the Gateshead Borough area seven principals are absentees; three practices have been pooled; three partners are absentees; and one principal who is an absentee has carried on his practice with an assistant deputizing. In the case of N.H.I. and P.M.S. patients the practice pool system has been adopted—that is, the capitation fee payable to an acting practitioner varies with the practice from which the patient comes. Payments in respect of patients who contract out of a partnership or deputy practice are made on a basis arrived at by averaging the pool values. In the case of private and P.M.S. patients a drug fund is formed for acting practitioners based on a 5% credit to the acting from the absentee practitioner.

During the first quarter of the scheme's operation the expense deduction was 7½%; for the last three quarters this figure has been reduced to 5% over all classes of practice. Since the N.H.I. Bureau costs much less to run than the Private Bureau a cash transfer is made quarterly from the former to the latter. The result of the above deduction is that in the case of insured patients acting practitioners divide 45% of an absentee's cheque while the absentee gets 50%. A partnership or a "deputy" practice receives 97½% of its cheque on behalf of the absentee. The apparent deduction of 2½% only is due, of course, to the fact that the N.H.I. Bureau handles only one-half of the full absentee's cheques, the absentee being paid his 50% direct by the Insurance Committee. In the case of private and P.M.S. patients the whole of the income is handled by the Bureau; in consequence 52½% of the income is paid to acting practitioners and 42½% to absentee practitioners. In actual figures the results were as follows:

Insured Patients

Total number of patients on single-handed absentees' lists: January 1, 1940, 2,691; July 1, 1940, 2,531.

Total number of patients on partnership and nominee practitioners' list: January 1, 1940, 4,886; July 1, 1940, 4,701.

Total number of patients of absentee practitioners on temporary lists of acting practitioners: January 1, 1940, 696; July 1, 1940, 1,391.

Total remuneration of absentee practitioners:	£	s.	d.
Single-handed practitioners	614	10	1
Partners and nominees	1,805	18	0
Total net payments to acting practitioners	576	19	7

The average quarterly unit value per temporary transfer paid to acting practitioners was 5s. 11d. for the quarter ending December 31, and fell to 2s. 4d. for the quarter ending September 30. The highest value paid in respect of any practice for any quarter was 7s. 3d. The average unit value for the whole period in respect of partnership and pooled practices was 2s. 5d. This figure will of course, in time, as more of the absentees' patients become temporary transfers, approach half the normal capitation value payable in respect of patients on a permanent list.

The total income accruing to the N.H.I. Bureau to meet expenses was £104 14s. 1d., of which £70 was transferred to the Private and P.M.S. Bureau. The expenditure of the N.H.I. Bureau was £32 10s. 6d.

The following results were obtained by the Private Bureau:

	£	s.	d.
Gross private accounts paid for year	484	13	4
Gross P.M.S. accounts paid for year, including partnerships	1,233	16	8
Total administration costs	172	17	6
Less received from N.H.I. Bureau towards such costs	70	0	0
Paid to acting practitioners (private accounts).. ..	246	7	0
Paid to acting practitioners (P.M.S. accounts).. ..	114	12	6
Paid to absentee practitioners (private accounts) ..	204	17	4
Paid to absentee practitioners, single-handed (P.M.S. accounts)	89	0	10
Paid to absentee practitioners, partners and nominated partners (P.M.S. accounts)	916	11	11

Total private accounts outstanding, £214 17s. 6d. at September 30 (Of this total £93 11s. has since been paid.)

The total of the private fees paid on account of absent practitioners is probably about one-third of that which these practices would bring in in normal times; this, I believe, has been a general finding throughout the country. The question of possible leakages has been carefully checked, and a deduction was made from the cheque of one practitioner for a misinterpretation of the scheme.

The committee now feels fairly confident that the scheme is being conscientiously administered by the acting practitioners. The discrepancy may be in part explained by the loss to absentees of new patients—there is a fair amount of movement of patients of the private class from one residential part of the Tyneside area to another—and to a tendency to "minimal" rather than "maximal" attendance, especially in the case of chronic patients of absentees. There are also a great many minor complaints which will take a patient to a doctor he knows well, but which he will put up with rather than consult a new one. In order to tighten things up still further the medical officer of health for the borough drew attention to several sources of income coming under the aegis of his department—for example, notification fees and fees payable under the Midwives Act, etc. He arranged that payment of such fees in the case of patients of absentee

practitioners would be adjusted by his department, which would pay 50% of the fee to the acting practitioner and 50% to the Bureau for payment to the absentee without deduction. Practitioners were circularized with respect to these fees and fees for insurance examinations, vaccinations, etc.

Apart from the rather unsatisfactory return from private practice, the Scheme has operated very smoothly.

Medical Services of H.M. Forces Appointments

ROYAL NAVY

Surgeon Commanders A. C. Shaw and R. A. Brown to be Surgeon Captains.
Surgeon Lieut.-Commanders J. M. McNamara and M. J. Brosnan to be Surgeon Commanders.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Lieut.-Commander W. F. Lascelles to be Surgeon Commander.
To be Surgeon Lieutenants: H. E. Rutherford and D. M. Sheppard.
Probationary Surgeon Lieut. J. Benn to be Surgeon Lieutenant.
To be Temporary Surgeon Lieutenants: L. D. Osler, A. G. Cumming, H. S. A. Corfield, L. Jones, and G. A. Bell.
Probationary Temporary Surgeon Lieuts. A. B. Pollard, D. Walton, D. E. Meares, and J. L. Hill to be Temporary Surgeon Lieutenants.

ARMY

Colonel B. Biggar, half pay list, late R.A.M.C., having reached the age for retirement, has been placed on retired pay.
Major R. J. Blackham, C.B., C.M.G., C.I.E., D.S.O., retired pay, late R.A.M.C., has been restored to the rank of Colonel on re-employment in that rank.
Lieut.-Colonel A. G. Tresidder, C.I.E., I.M.S. (ret.), has reverted to the rank of Major at his own request whilst employed during the present emergency.
Colonel R. S. Townsend, M.C., I.M.S. (ret.), has reverted to the rank of Major at his own request, whilst employed during the present emergency.

ROYAL ARMY MEDICAL CORPS

Lieut.-Colonel (Temporary Colonel) J. A. L. Wilson having attained the age limit for retirement has retired and remains employed.
Lieut.-Colonel S. P. Sykes has retired and remains employed.
Major (Temporary Lieut.-Colonel) R. D. Davy, M.C., to be Lieutenant-Colonel.
Majors F. McKibbin and K. M. Nelson, M.C., to be Lieutenant-Colonels.
Captain T. D. M. Martin has relinquished his commission on account of ill-health.
J. E. Miller to be Lieutenant (on probation).

ROYAL AIR FORCE

Flight Lieut. O. M. Fraser to be Squadron Leader.
Flying Officers B. C. Curwood and R. Napier to be Flight Lieutenant.
To be Medical Officers with the relative rank of Flying Officer: Mary J. Allardice and Winifred A. Kane.

ROYAL AIR FORCE RESERVE

Flying Officer J. H. L. Newnham to be Flight Lieutenant.

AUXILIARY AIR FORCE

Flying Officer C. Roff to be Flight Lieutenant.

ROYAL AIR FORCE VOLUNTEER RESERVE

To be Squadron Leaders: A. C. P. Campbell and I. J. Davies.
To be Flight Lieutenants: S. I. Ballard, H. A. D. Small, T. A. Edwards, D. C. Farquharson, G. E. Hesketh, and F. T. Madge.
Flying Officers R. Carpenter, J. H. McElney, P. Griffiths, G. L. Gryspeerdt, A. Caplan, J. Watkins-Pitchford, D. A. P. Anderson, A. S. Lee, J. R. Conelly, T. A. James, W. Poskett, A. J. Smith, W. F. Walton, H. G. Vyse, T. V. Mendlesohn, T. A. W. Edwards, K. G. Bergin, C. R. Hamand, D. Stafford-Clark, and D. Sheehan to be Flight Lieutenants.
Pilot Officers J. L. Trent and J. G. M. McMurchy to be Flight Lieutenants.
Flight Lieut. C. O. Gange has resigned his commission.
To be Flying Officers: E. E. Bowen, D. I. Buchanan, C. W. D. Cole, N. Dugmid, N. G. Farrell, J. Fiddes, F. E. Fletcher, D. M. I. Freeman, H. O. Hughes, R. K. McElderry, A. G. Spencer, C. S. Ashwell, G. Beven, D. Canning, J. K. T. Cherry, H. H. Dickson, L. Fridjohn, H. L. Garstein, B. R. Isaacs, D. A. Lindsay, L. H. Lithman, R. L. P. Lytle, D. H. MacCormack, J. McGregor, C. D. Ross, J. R. Simpson, W. G. Smeaton, L. G. Tulloch, I. Young, G. Ashforth, D. M. R. Barry, G. D. S. Briggs, M. A. Charrett, D. E. Christie, I. L. W. Clancey, H. D. Elliott, C. H. Gibson, J. W. K. Harper, T. H. Hughes, J. H. Jacobs, D. L. Johnson, P. R. Latcham, P. St. G. Robinson, A. Skene, J. A. H. Smart, R. F. Stronge, L. L. Whytehead, C. M. Chambers, T. C. Corson, D. J. Dawson, W. R. Dyke, D. G. Evans, S. Gnessen, J. Phillips, E. Robinson, J. Rubie, and R. N. Stansfield.

ROYAL AIR FORCE VOLUNTEER RESERVE: DENTAL BRANCH

Flying Officer J. L. Trainer, L.R.C.P. & S.Ed., to be Flight Lieutenant.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Colonel R. M. Dickson, O.B.E., has ceased to belong to the Reserve of Officers on account of ill-health.
Major H. E. P. Yorke, M.C., has ceased to belong to the Reserve of Officers on account of ill-health.
Captain (acting Major) E. J. Mannix to be Brevet Major, under the provisions of Article 168, Royal Warrant for Pay and Promotion, 1940.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Captain A. L. Evans has relinquished his commission on account of ill-health and has resumed the rank of Captain.
Captain R. A. Kernohan has relinquished his commission on account of ill-health.
Captain R. J. Hyder has relinquished his commission on account of ill-health. (Substituted for the notification in the *Supplement* to the *London Gazette*, date September 13, 1940.)
War Substantive Captain M. K. Mellett has relinquished his commission on account of ill-health.
Lieut. F. J. Fowler to be Captain.

LAND FORCES: EMERGENCY COMMISSIONS

ROYAL ARMY MEDICAL CORPS

Lieut. R. M. Williams has relinquished his commission.
Lieut. L. L. Ratazzi has resigned his commission.
Lieuts. W. S. McBride and G. M. Gibb have relinquished their commissions on account of ill-health.
Dr. (Lieut.) Muriel Boycott has relinquished her appointment.
Dr. D. K. Small, Medical Officer with the relative rank of Captain, has relinquished her appointment on account of ill-health.
To be Lieutenants: J. Gaughan, A. Coyer, E. D. Forster, D. S. Johnson, A. W. F. Craig, W. R. Blore, M.C., J. J. McCall, T. L. Macdonald, M. D. Milne, D. Thomson, W. A. L. Macfadyen, G. C. Shepherd, R. W. Taylor, N. W. Rawlings, G. A. Bell, C. J. Cellan-Jones, S. L. Henderson, R. M. Maher, J. J. Reeks, L. R. Jordon, A. G. Brown, E. W. Evans, R. M. Johnson, J. A. Key, C. J. R. MacDonald, B. Phillips, J. M. Ross, J. C. Scott, W. F. Smyth, J. Watt, F. de Burgh-Whyte, J. W. Bigger, T. W. Carrick, J. C. Gillett, K. W. Leon, P. S. Wright, S. Adams, J. P. S. Dunn, F. H. McKenna, W. G. Q. Mills, P. Nathan, F. O. Potter, J. H. Rees, D. J. Campbell, J. Fielding, R. W. L. Hall, M. McAlley, J. D. Morgan, P. R. Rainford, D. F. Sheriff, J. S. Simmers, R. Farncombe, J. A. Perkins, J. R. D. Williams, T. C'sato, G. W. Hearn, R. A. Henson, J. P. Lask, J. J. Messant, P. J. G. Quinn, S. Samuels, B. Schwartz, B. W. Wood, E. A. Wood, T. C. Thorne, H. Barrowman, J. G. Bickerton, W. M. Down, K. J. Dunlop, R. Finlay, A. J. Fulthorpe, W. G. C. Gillies, P. D. Johnson, T. W. Lees, G. J. Levden, J. McGarrity, A. S. McKenzie, H. J. McPherson, D. J. Roberts, G. B. Royce, H. F. Strickland, F. J. Fish, J. O'D. Alexander, F. C. McLaren, G. B. Malone-Lee, H. I. H. Porcher, L. R. D. Smith, E. W. L. Thompson, T. G. Wilson, H. D. O'Brien, D. Loughridge, G. A. Anderson, G. W. Armour, S. Y. Baird, J. M. Ellis, S. T. G. Gray, W. Magowan, S. F. Mitchell, K. C. W. Shawcross, M. B. Watson, W. M. Winter, F. Dornan, E. F. Edson, W. Fielding, H. D. Hudd, K. K. Hussain, A. P. Massie, W. Morron, W. R. N. Sutherland, W. S. Thomson, H. Tatton, F. A. S. Austen, G. H. M. Hemsted, E. D. Pridie, O.B.E., D.S.O., J. Fleming, R. L. Lancaster, R. B. Campion, V. M. Skoufarides, B. S. Sabet.

COLONIAL MEDICAL SERVICE

J. B. Davy, M.B., D.F.M., has been appointed Senior Medical Officer, Tanganyika Territory.

DIARY OF SOCIETIES AND LECTURES

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At Royal Society of Medicine, 1, Wimpole Street, W., *Mon.*, 3 p.m., Mr. L. E. C. Norbury, Carcinoma of the Rectum, with Special Reference to its Pathology and Treatment, based on a survey of cases at St. Mark's Hospital during the past ten years; *Wed.*, 3 p.m., Mr. Norman Capener, The Lumbo-sacral Joint: A Discussion upon Spondylolisthesis, Scoliosis, and Sciatica; *Thurs.*, 3 p.m., Mr. R. E. Smith, The Undescended Testicle.

VACANCIES

MEDICAL REFEREES UNDER THE WORKMEN'S COMPENSATION ACT, 1925, for dermatological cases arising in the County Court Districts of Accrington, Blackburn and Clitheroe, Blackpool, Chorley, Lancaster and Preston (Circuit No. 4), Liverpool, St. Helens and Widnes, Southport and Wigan (Circuit No. 6), Altrincham, Warrington, Birkenhead, Runcorn, Chester, Crewe and Nantwich, Market Drayton and Northwich (Circuit No. 7), Ashton-under-Lyne and Stalybridge, Burnley, Colne and Nelson, Todmorden, Congleton, Macclesfield, Hyde, Stockport and Rawtenstall (Circuit No. 10). Applications to the Under-Secretary of State, Home Office (Industrial Division), Cleland House, Page Street, S.W.1, by February 1.

MEDICAL REFEREES UNDER THE WORKMEN'S COMPENSATION ACT, 1925, for dermatological cases arising in the County Court Districts of Abergavenny, Pontypool and Blaenavon, Monmouth, Cardiff and Barry, Chepstow, Newport, Tredegar, Abertillery and Bargoed (Circuit No. 24), Aberdare and Mountain Ash, Merthyr Tydfil, Pontypridd, Ystradyfodwg and Porth, Bridgend, Neath and Port Talbot (Circuit No. 30), and Aberayron, Cardigan, Carmarthen, Llandilo Fawr and Ammanford, Lampeter, Llandovery, Llanelly, Newcastle-in-Emlyn, Aberystwyth, Haverfordwest, Pembroke Dock and Narberth, and Swansea (Circuit No. 31). Applications to the Under-Secretary of State (Industrial Division), Home Office, Cleland House, Page Street, S.W.1, by February 1.

APPOINTMENTS

COLLS, MARGARET, M.R.C.S., L.R.C.P., Temporary Medical Officer, Women's Internment Camp, Isle of Man.

O'FARRELL, P. T., F.R.C.P.I., D.P.H., D.T.M., Visiting Physician, St. Vincent's Hospital, Dublin.

EXAMINING FACTORY SURGEONS.—W. R. H. Pooler, M.B., B.Ch., for the Wellington District (Shropshire); D. A. Richards, M.B., Ch.B., for the Appleby District (Westmorland).

B.M.A.: Branch and Division Meetings to be Held

ABERDEEN BRANCH: CITY OF ABERDEEN DIVISION.—At Marischal College, Aberdeen, Tuesday, January 21, 8.30 p.m. Prof. E. W. H. Cruickshank: The Factors which determine the Essential Foods in Wartime.

DORSET AND WEST HANTS BRANCH: BOURNEMOUTH DIVISION.—At Boscombe, Wednesday, January 22, 3.30 p.m. Address by Mr. L. D. Gammans, Deputy Regional Information Officer, Ministry of Information: The New Method of Waging Warfare.

SOUTH WALES AND MONMOUTHSHIRE BRANCH: SWANSEA DIVISION.—At Mackworth Hotel, Swansea, Thursday, January 23, 2 p.m. B.M.A. lecture by Dr. W. Ernest Lloyd: Diseases of the Chest (illustrated).

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

MARRIAGE

STEVENSON—DUKE.—On January 2, 1941, at Holy Trinity Church, Cambridge, Claude M. Stevenson, M.D.Cantab., to Johanna Duke, widow of the late W. H. Duke, Fellow of Jesus College.

DEATH

MCKAIL.—On January 10, 1941, at Abington, 81, Carmyle Avenue, Carmyle, Glasgow, Robert Buchanan Forbes McKail, M.B., Ch.B., D.P.M., late Medical Superintendent of Brockhall Certified Institution for Mental Defectives, Langho, Lancashire.

BRITISH MEDICAL JOURNAL

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ACUTE BRONCHIOLITIS IN CHILDREN

BY

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AND

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(WITH SPECIAL PLATE)

"Capillary bronchitis may well be termed the essential lesion of influenza" - HORDER.

Capillary bronchitis, or, as it is better called, acute bronchiolitis, is not generally admitted to be a clinical or pathological entity. The pathologists, the paediatricians, and the writers on diseases of the chest for the most part deny it a separate existence. The general view is expressed by Norris and Landis (1938): "The latter term [i.e., capillary bronchitis] should never be used. While a lesion limited to the finer bronchioles is possible theoretically, practically it never exists alone, as an inflammatory process invading the swollen bronchi inevitably extends to the anatomically related and contiguous vesicles as well. The term 'bronchopneumonia' is much the most preferable designation, and by common consent is the one now in general use." It is difficult to share this view when one has, in an influenza epidemic, seen dyspnoeic and cyanosed children die in asphyxia. Holt and McIntosh (1933), for example, express a contrary opinion when, in an account of acute bronchiolitis in children, they write: "The symptoms, however, are due chiefly to a bronchitis which extends to the smallest tubes. Fibrinous exudate, and in some cases oedema, cause obstruction with great respiratory distress." Horder (1933), too, in the admirable article on influenza quoted above, writes: "But the dominant feature, rarely absent in any really severe case, is a condition of capillary bronchitis, with intense pulmonary congestion. This may be unilateral or bilateral, is more often basal than apical, but it is not seldom universal. This condition may well be termed the essential lesion of the disease, for even when actual consolidation of the lung is present this is quite often an incident by comparison, and if the patient dies he dies with the consolidation rather than of it."

In the catarrhal epidemic of January–March, 1940, the majority of patients escaped with an acute pharyngitis, but in many the larynx, the trachea, the bronchi, the bronchioles, or the alveoli were progressively involved. When the inflammation extended to the bronchioles dyspnoea and cyanosis became urgent symptoms, and although this phase was most obvious in babies and young children it was by no means absent in adult infections. Discussion here will, however, be limited to this condition of acute bronchiolitis in children, for in them it ranks as a first-class medical emergency.

The cases on which this paper is based were seen mainly in hospital practice. Fifty children were admitted to the Derbyshire Hospital for Sick Children with an acute respiratory infection during the first ten weeks of 1940. Twenty-seven of these were under the age of 1 year. Seven children died, all of them under the age of 2. Six other children were seen in family and consulting practice, and although these added little to the clinical picture they included two deaths in healthy middle-class children, aged respectively 4 and 2, and corrected the common impression that fatalities do not occur except in infants or in debilitated children. It is not suggested that all these children were suffering from acute bronchiolitis: in some of them the final diagnosis was acute bronchitis and in others bronchopneumonia, but in many it was possible to diagnose a phase in the infection when the small bronchioles were filled with exudate. Occasionally the children died in this phase of obstructive dyspnoea; some recovered without further extension of the inflammatory process, but more often the condition went on to bronchopneumonia, in three cases with a fatal termination some weeks later. No detailed case histories will be given, but a composite clinical picture of acute bronchiolitis will be attempted, and the treatment of the condition will be discussed in detail. In order that the clinical diagnosis may be substantiated the pathological appearance of the lungs in an infant who died in asphyxia will be described and illustrated.

Aetiology

Acute bronchiolitis is rarely seen except when influenza of a respiratory type is epidemic. It is not limited to any age group, but it is in children under the age of 2 years that its attack may be so often overwhelming. This may depend on a defective local resistance in the absence of any acquired immunity; often another factor appears to be the heightened virulence of an invading organism in its passage through several hosts, for the baby is usually the last member of the household to contract a catarrhal infection.

It is most often seen in children of the poorer classes, and here the lower immunity presumably depends on environmental factors: defective and injudicious feeding, confined living-space, and closer contact with infections. Middle-class children by no means escape, however, and the most rapid death in this series (thirty-six hours from the onset) was that of the son of a professional household whose nature and nurture were ideal.

No influenza-A virus was recovered by the Medical Research Council workers (C. H. Andrewes, in a personal

communication) during the 1940 epidemic, with the exception of one specimen brought back from the army in France. It will be remembered that Stuart-Harris, Andrewes, and Smith (1938) attempted a clinical differentiation of influenza, in which their virus was recoverable, from "febrile epidemic catarrhs," in which it was not. One of the clinical distinctions suggested was the much greater incidence of acute bronchiolitis in virus influenza. Further investigation has demonstrated that no such clinical differentiation is possible (Stuart-Harris, Smith, and Andrewes, 1940), since most of the clinical criteria, including acute bronchiolitis, occurred commonly in the non-virus epidemics of 1939 and 1940. Large numbers of throat swabs were examined by one of us (G. R. O.) in the 1940 epidemic, but the findings were too inconstant to assume that the epidemic was due to the organisms demonstrated by the usual methods of smear and culture. Pneumococci (not belonging to Group 1, 2, or 3), fusiform bacilli and spirochaetes of Vincent, Gram-negative diplococci of the *catarrhalis* group (later meningococci also), and streptococci (*viridans* and haemolytic) were the organisms most commonly found. The variable findings soon led to the belief that these swabs were only demonstrating secondary invaders. Unfortunately we did not succeed in getting a case within forty-eight hours of the onset to send washings for examination for virus. All cases coming to hospital had, after the onset, been sick outside for over two days.

Morbid Anatomy

The main features of the histopathology of influenzal virus-infection in experimental animals are described in somewhat similar terms by the different investigators. Straub (1937) states that the primary lesion in mice infected with human influenza virus is a fibrinoid necrosis of the epithelium of the terminal and respiratory bronchioles leading to a state of complete epithelial desquamation. He gives a photomicrograph of an acellular fibrinoid plug in a bronchiole, and states that the exudation of polymorphonuclear leucocytes is not a feature unless secondary infection takes place. Other investigators do not refer to a "fibrinoid" exudate. Shope (1934) describes the bronchial exudate in ferrets infected with the swine influenzal virus as "a thick, tenacious, glassy, white mucous exudate which is usually profuse." He finds large numbers of inflammatory cells in the walls of alveoli, but the air sacs themselves contain coagulated plasma and very few cells. Shope and Francis (1936) find a similar picture in the lungs of swine infected with human influenza virus. The cut bronchi show a less abundant glassy, tenacious mucous exudate. There was epithelial damage and a pronounced peribronchial round-celled infiltration. The alveolar walls were much thickened, but there were few cells in the alveoli. Nelson and Oliphant (1939) studied the development of the lesions in mice infected with human virus. Like other observers they find the earliest lesion (eighteen to twenty-four hours) is damage to the bronchial epithelium, but there is an exudate in which polymorphonuclear leucocytes predominate. By forty-eight hours the polymorphs become necrotic and epithelial damage is more severe. The interstitial alveolar exudate appeared in three days, and this was the time the animals began to die.

The essential features of experimental influenza may therefore be summarized thus: (1) more or less complete destruction of bronchiolar epithelium; (2) obstruction of the lumen of bronchi and bronchioles by a plug of "thick, tenacious, glassy, white mucous exudate"; (3) peribronchiolar cellular infiltration extending to the interstitial tissue of some of the neighbouring alveoli; (4) alveolar sacs mostly free from exudate, but some close to affected bronchioles contain a serous exudate with few cells. These essential features were all present in the necropsies now to be described, and this is part of the justification for regarding them as truly influenzal.

During the 1940 epidemic in Derbyshire opportunities for post-mortem examination occurred in a number of cases. Two of these were especially interesting because they were almost pure acute bronchiolitis.

A boy aged 1 year and 7 months died in the Derbyshire Hospital for Sick Children; the necropsy was made on February 1, 1940. The pharynx and trachea showed simple reddening with no membrane and little exudate. The lungs were markedly emphysematous; they did not collapse when the chest was opened, but met in front of the heart. There was no pleural exudate. The cut surface of the lungs did not show any obvious pneumonic consolidation—the general emphysema gave the reverse appearance. Small pearly nodules very closely resembling miliary tubercles stood up all over the cut surface. They were not as numerous as in most cases of miliary tuberculosis: there were no tubercles elsewhere in the body, and acid-fast bacilli were absent. The nature of these "tubercles" is shown in the photomicrographs. Fig. 1 (see Plate) shows the lumen of a bronchiole 0.7 mm. in diameter. It is plugged with tenacious mucus in which only a few cells are present. The epithelial lining is completely necrotic and the wall is infiltrated with polymorphs, lymphocytes, and macrophages. Most of the alveoli near this bronchiole are overdistended with air, but in one part inflammatory changes have taken place; these are interstitial engorgement and infiltration and a serous exudate into the alveolar sacs. This mucous plugging and epithelial destruction was the typical lesion in the larger bronchioles; some contained rather more pus. Fig. 2 shows the changes in the smaller respiratory bronchioles. This bronchiole is seen to be plugged with a cellular exudate obviously different from the plug of mucus just described. The cells in the exudate are necrotic polymorphs with pyknotic nuclei and macrophages which are well preserved. Changes in the surrounding alveoli are similar to those shown in Fig. 1. A number of sections were examined after staining by Gram's method, but no organisms could be found. The remaining organs in this child showed nothing of interest.

Fig. 3 is from a woman aged 36. Necropsy was performed on February 29. The lungs were both markedly emphysematous and showed no pneumonic consolidation. The lesions were virtually the same as in the baby. This photomicrograph shows a small bronchus with cartilage. There is some necrosis of the lining epithelium, cellular infiltration is relatively slight, mucous glands are secreting freely, and the lumen is blocked by a plug of tenacious white mucus with very few inflammatory cells. The diagnosis before death in this case was influenzal bronchitis (not pneumonia), and dyspnoea and cyanosis were prominent features.

A third case may be mentioned because the patient, a man aged 50, died on February 21, 1940, less than an hour after an injection of morphine. His lungs were markedly emphysematous and met over the heart; the right weighed 19 oz. and the left 20 oz. There was no obvious pneumonic consolidation, but the bronchi were blocked by muco-purulent plugs. His other organs were healthy, but the heart weighed 16 oz. and showed early coronary arteriosclerosis.

The main difference between the lesions in these human cases and those in the experimental animals is the extent of the emphysema. Jackson (1934a) describes four types of bronchial obstruction by foreign bodies and exudates. In the "by-pass valve" ingress and egress of air are checked but not prevented, so there is no collapse or emphysema of the lung. In the "check-valve" type air can enter, but the egress is stopped, and this results in emphysema. The third type is a "stop-valve" which causes obstructive atelectasis. The fourth type is really a variant of the third type—a ball-valve obstruction allowing egress only, which results in rapid and complete atelectasis as in the "stop-valve" effect of Type 3.

In view of the great clinical importance of these plugs of mucus it would be interesting to know how they arise. Cartilage disappears from bronchi when they reach a diameter of about 1 mm.; the tubes smaller than this are known as bronchioles. Some state (e.g., Maximow and Bloom, 1934) that the mucous glands disappear with the cartilage. Others (e.g., Lewis and Stohr, 1913) state that glands may extend beyond the cartilage and that goblet cells may be found until the ciliated columnar epithelium gives way to cuboidal and then respiratory epithelium. Miller (1940) states that cartilage disappears when the diameter reaches 0.6-0.7 mm. and that goblet cells become less as the diameter falls and disappear in bronchioles of about 0.4 mm. However this may be, it is notable that plugs of mucus are found in bronchioles much smaller than those which are said to have mucous glands. Was this mucus secreted by the epithelium before it was destroyed, or was it secreted by glands in larger bronchi?

Signs and Symptoms

The onset may be acute, with fever, very rapid and laboured breathing, cyanosis, severe cough, and prostration; but more often the child has for a day or two a slight temperature, pharyngeal cough, and some gastro-intestinal upset before the infection extends. The larynx may next be affected; the child develops a laryngeal cough together with soreness over the larynx, hoarseness of the voice, and sometimes aphonia. Dyspnoea and stridor, due to laryngeal spasm, may be present at this stage. From this phase the child may pass quite suddenly to bronchiolitis. The ultimate bronchioles become plugged with exudate and the clinical picture is dominated by *obstructive dyspnoea*. Respiratory distress is then very marked; the respiration rate is rapid—from 60 to 100 a minute. There is recession of the soft parts of the chest during inspiration. Cough is always incessant and disturbing. Cyanosis is often obvious quite early, but becomes extreme towards the end. Collapse is usually terminal, but sometimes the toxaemia appears to be profound from the start and the child is quickly apathetic and stuporous. The characteristic clinical picture is distressing and unforgettable: the head turning restlessly from side to side on the pillow, the dusky cyanosis of the lips and cheeks, the expression concentrated but unprotesting, the wildly distressed breathing, the relentless cough, and the final apathy. The physical signs are dominated by the presence of fine rales scattered over both lungs and, particularly towards the hila, mingled occasionally with coarser rales. The air entry is everywhere diminished, but there is no evidence of consolidation. The percussion note is more resonant than normal owing to the emphysema which is usually present. Sometimes sibili accompanying prolonged expiration may be heard, suggesting the presence of bronchiolar spasm. Occasionally large areas of collapse at the base may be suspected, presumably due to the blocking of large bronchioles with exudate. The degree of local emphysema or collapse presumably depends on whether the obstruction is of the "check-valve" or the "stop-valve" type.

The course varies considerably. A child acutely ill may be well and without symptoms in three days. Death from obstructive dyspnoea occurs, if at all, on the second, third, or fourth day. More often the fine rales give way to the coarse rales of an ordinary bronchitis when the acute phase is over, and this may persist for a few days. Sometimes consolidation develops and a protracted broncho-pneumonia sets in; occasionally a whole lobe is consolidated. The recovery of the urgent and severe cases with obstructive dyspnoea appears to depend on the institution of the measures detailed below.

Treatment

A student examining the measures advised by a score of authorities for the treatment of acute bronchitis and bronchopneumonia in children will find opinions so various that he may doubt if a multitude of counsellors achieves wisdom. He will discover that on such questions as fresh air, hydrotherapy, steam tents, oxygen, alcohol, digitalis, emetics, stimulants, mustard baths, plasters, poultices, venesection, blood transfusion, sedatives, and cough-mixtures there are as many opinions as authors. Abt (1939) represents mature opinion when he writes of the treatment of pneumonia in children: "We have long believed that one form of symptomatic treatment was as good as another provided neither form did harm."

One of the general methods to be adopted in the treatment of acute bronchiolitis is that these children should be nursed in warm moist air, with an adequate oxygen supply. In gamgee jackets, in antiphlogistine, and in linseed and mustard poultices it is difficult to put faith, but it is more difficult still to withstand the expectations of nurses and parents. Alcohol is the best sedative for children (and phenobarbitone the second-best). Brandy, whisky, or port may be used for children; doses may be individually determined, but 30 minims to 1 drachm two or three times in the twenty-four hours is an adequate dose for a child of 1 year. *No other sedative should be used for children with acute bronchiolitis, for if by sedatives their respiratory excursions are depressed and their coughs are quieted they die: any derivative of opium may bring a sleep which is final.*

"All bronchial therapy is futile," wrote the great Osler, dying of an influenzal infection; and this death-bed pronouncement has a papal quality. Moreover, there is to-day no need to resort for help to the Virginian prune, the wild lettuce, or ipecacuanha. Least of all to ipecacuanha: children are either not ill enough to justify the use of it in emetic doses or are too ill for this to be a wise therapy. In the treatment of acute bronchiolitis there are four factors demanding separate consideration—the infection, the obstructive dyspnoea, the cyanosis, and the collapse.

The Infection

It is important to use sulphapyridine (M & B 693) in full dosage, and to use it quickly. Infants 1 year old who are acutely ill when first seen should be given 1 gramme (2 tablets) immediately and 1/2 gramme four-hourly in the succeeding twenty-four hours. It is necessary to continue with the sulphapyridine tablets for at least a week in gradually decreasing doses, otherwise the infection will in many cases relapse and a protracted bronchopneumonia may develop. If it does so it becomes obvious in the second or third week that the sulphapyridine is having no influence on the course of the infection. It may be necessary to give the sulphapyridine by intramuscular injection; 3 c.cm. of the injection being mixed with 3 c.cm. of normal saline, and particular care being taken to inject direct into muscle. This is not easy in infants, who have little muscle and much subcutaneous fat. Large and slowly healing areas of necrosis are a common sequel of careless administration. It is rarely necessary to employ intramuscular injection: children are not usually disturbed by the ingestion of sulphapyridine. Alkalis or nicotinic acid are effective in relieving nausea and vomiting. This therapy rests on the assumption that the bronchial invaders are sensitive to sulphapyridine. Certainly there was no doubt of this in the last epidemic. The infection was quickly under control, and if the child could be maintained through its period of obstructive dyspnoea for a short time the sulphapyridine usually did the rest.

INDICATIONS FOR SULPHAPYRIDINE THERAPY

What are the indications for the use of sulphapyridine in the acute catarrhal infections of childhood? This is a question to which many different answers may be given: it will be generally agreed that there is seldom evidence in children, even with considerable dosage, of extreme depression of granulopoiesis. These are some empirical suggestions for its employment:

1. It should only be used if the infection appears to be severe enough to justify a week's therapy.

2. It should be used more often in epidemic than in sporadic cases, in weakly and debilitated children than in the healthy, in catarrhal infections complicating measles and whooping-cough than in primary infections.

3. It should always be used in infections with an acute onset—i.e., convulsions or rigors or high temperatures.

4. It may be more safely omitted in lobar pneumonia than in bronchopneumonia.

5. There is only need for its urgent administration in acute infections. In less severe infections a period of observation for the mobilization of the host's resources seems rational. It is easier to justify delay than the use of desultory or half-hearted measures.

The Obstructive Dyspnoea

This is the most urgent symptom, and *steam* usually brings great relief. The majority of modern writers will have none of it; others allow a kettle in the middle of the room at some distance from the bed; and a few permit a half-tent over the head of the bed. Steam-tents are the antithesis of the fresh-air treatment of pulmonary infections; but what proved virtue has fresh air besides its oxygen content? Those writers who believe that "fresh air has a stimulating effect on metabolism" are very careful to warn against air that is too fresh—i.e., a draught—and they temper their enthusiasm for alfresco therapy with warnings against the vagaries of the British climate. Moreover, where is this fresh air in an oxygen tent? There is no need to be afraid of surrounding the child with an atmosphere of steam: it is soon obvious that the patient's dyspnoea is relieved. The steam-kettle should be used with its nozzle inside the tent for periods of half an hour, and the child should be replaced in steam whenever breathing becomes difficult.

If there appears to be any bronchial spasm exaggerating the obstruction 2 minims of adrenaline (1 in 1,000) should be used and repeated. Otherwise, 1/150 grain of atropine, repeated four-hourly, seems helpful in decreasing the bronchiolar exudate.

We have no experience of bronchoscopic aspiration in this condition, nor any knowledge that it has been used in this country. Chevalier Jackson (1934b) writes thus of the kindred condition which he calls "self-drownage": "The accumulation may literally drown the patient in his own secretions. This is illustrated frequently in influenza and arachidic bronchitis. Infants cannot expectorate, and their cough reflex is exceedingly ineffective in raising secretion to the larynx. The cough reflex may be entirely absent in children. Age may be cited as one of the most frequent etiologic factors in the condition of self-drownage. Bronchoscopic aspiration is quite efficient, and can save any patient not affected with conditions that are fatal by other pathologic processes." Bronchoscopic aspiration under these conditions requires the services of an expert bronchoscopist who is accustomed to bronchoscopy in children without general anaesthesia.

The Cyanosis

Cyanosis is the indication for oxygen, which should be delivered through a Woulfe's bottle of warm water and a nasal catheter at the rate of three litres a minute for an infant (a rate of flow which is a continuous stream, making the water splash in the Woulfe's bottle). The nasal catheter is to be preferred to the small oxygen tent in acute bronchiolitis, for delivery by nasal catheter has the advantage that steam can be employed at the same time. The oxygen should be used continuously as long as the cyanosis persists and not, as is often recommended, for a few minutes every hour.

The Collapse

No measures devoted to preventing or relieving circulatory failure have the same importance as those already described. There is no drug which re-energizes the failing heart nor any which has a selective action in an overcharged venous system. Coramine is the drug which seems best to stimulate the failing circulatory system, and should be used for a child of 1 year by intramuscular injection in 0.5 c.cm. doses every four hours. Strychnine, adrenaline, camphor, digitalis, strophanthin, and eucortone all have their advocates. It is difficult to assess these last-minute remedies that are intended to arrest the patient's progress from the "saddle to the ground." Most often they appear to delay this progress rather than to check it finally; perhaps they are best regarded, in a friend's indulgent words, as "house-physicians' treatment." Some of them may be definitely harmful and are better avoided. Venesection is frequently recommended for right-sided heart failure; one paediatrician commends the withdrawal of "a drachm or two of blood from a vein as a most useful measure and one that is probably not employed often enough." It would certainly need to be used very often in this measure to make any difference to an overcharged circulation. Nothing less than the removal of 50 c.cm. would seem likely to give any relief to a child with a blood volume of more than twelve times this quantity. In cyanosed children with distended jugular veins it has definitely appeared to be of value, especially if the blood is removed rapidly from the circulation.

Summary and Conclusions

It is contended that acute bronchiolitis is the essential pulmonary lesion in epidemic influenza, as it is in experimental influenza. This condition is particularly common in young children, in whom it produces urgent dyspnoea and, if not vigorously treated, death by asphyxia.

The clinical picture and the morbid anatomy of the condition are described. It is suggested that the respiratory obstruction is caused by mucus in the bronchioles. The lungs of an infant showing this condition are described and illustrated.

Sulphapyridine, steam, and oxygen are the essential therapeutic measures. Bronchoscopic aspiration in the hands of the expert may be life-saving.

The use of any sedative demands especial watchfulness: opium or its derivatives bring swift disaster.

We are indebted to Dr. E. P. L. Hughes for permission to review some of his case notes and also to Detective-Sergeant J. S. Fayers for the photomicrographs.

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EXPLORATION OF THE COMMON BILE DUCT FOR STONE

DRAINAGE WITH T-TUBE AND CHOLANGIOGRAPHY

BY

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(WITH SPECIAL PLATE)

In the early days of operations for cholelithiasis the majority of surgeons were content to remove the stones and drain the gall-bladder. The operation was comparatively easy and, as operations went in those days, comparatively safe, and it was regarded as the ideal surgical treatment. Not all surgeons, however, accepted this view, and there were not wanting restless intrepid spirits who did not hesitate to remove the gall-bladder if it was obviously diseased; but even they viewed with misgivings any condition which necessitated interference with the common bile duct. Their reluctance was due not so much to the added difficulties of the operation as the fear that if an actual fatality did not result they might be left with a persistent biliary fistula. Too often had they encountered fistulae following on drainage operations of the gall-bladder, and the thought no doubt was uppermost that a fistula, almost inaccessible if not irremediable, might result. Consequently the pioneers of operations upon the common bile duct were at great pains to secure a watertight closure of the duct, and as a further precautionary measure they closed the abdomen without drainage. Complete closure was found to be a mistake, for in spite of their efforts there was leakage of bile, with fatalities due to peritonitis. This danger was averted by insertion of a drainage tube down to the suture line, and it was found that the duct healed satisfactorily. Indeed, it was soon evident that, provided the duct had not been grossly damaged, it required little suturing. Some even went so far as to omit suturing altogether, with no untoward result; in fact, the danger of fistula was more imaginary than real, and if a temporary fistula were required for hepatic drainage, then it was necessary to stitch a tube in the duct itself, the duct again closing rapidly when the tube came away.

Granted the remarkable healing powers of the common bile duct; yet it has always been a most debated step among surgeons as to whether or not exploration of the duct should be carried out in *all* operations for cholelithiasis. It adds to the time and gravity of the operation, since it is performed at depth—sometimes at great depth and with great difficulty. Obviously if the duct contains a stone it must be removed, for cholecystectomy will not rid the patient of his trouble: as well might one lock the stable door when the horse has bolted. It is in cases, however, in which there is little or no indication for exploration of the duct or in which the surgeon is in doubt as to whether he is dealing with an impacted stone, an enlarged gland, or a thickened portion of pancreas, that controversy arises. There are those who affirm that the duct should be explored in all cases in which operation is undertaken for cholelithiasis or cholecystitis, and they produce statistics to prove their point. Statistics, as someone has remarked, may be made to prove anything, even the truth, but much evidence is accumulating to prove the contention that this step should be more often carried out. In many instances where patients have had their gall-bladders removed they have not been completely relieved of their sufferings, and indeed to their great disappointment sometimes have a return of symptoms in all intensity. This is due to stone in the common bile duct that has been overlooked or neglected. If not due to actual stone, the advocates of common bile duct exploration say it is due to biliary mud or inspissated mucus, which could have been remedied by drainage of the duct and dilatation of the sphincter of Oddi, a muscle which they maintain is always in spasm in such cases. A second operation is not welcomed by the patient or the surgeon, for it is more difficult and more dangerous.

Surgeons are well aware of the added difficulties and dangers of common bile duct exploration, but Lahey of Boston, who is a strong advocate of this step, thinks that with a surgeon of competence and experience in biliary surgery this step does not entail any more danger to the patient—in fact, quite the contrary. In a large series of cases in which he or his colleagues of the Lahey Clinic have explored the common bile duct, only one patient in whom no stones were found died following exploration. On the other hand, the mortality from secondary operations for stone in the duct was out of proportion. He further warns against too much reliance being placed upon clinical features which heretofore were regarded as a *sine qua non* of stone in the common bile duct. The following summary embodies most of his findings.

Clinical Features of Stone in Common Bile Duct

Jaundice.—This symptom, which was considered a sheet-anchor in diagnosis, is absent in at least one-third of cases. Lahey in a review of three separate series of cases in which stones were present in the common bile duct found that jaundice was absent, and never had been present, in not less than 37 % of cases—in his last series 39 %. Snell of the Mayo Clinic lays emphasis on the fact that stones in the common bile duct rarely if ever completely occlude the duct for long, and so the stools or duodenal contents always contain bile at one time or another. On the other hand, an evanescent jaundice associated with colic and cholelithiasis does not necessarily mean a stone in the common bile duct, as it may be due to hepatitis or mild cholangitis.

Colic.—From 75 to 80 % of patients suffer from upper abdominal colic at some stage of the disease. This means that at least 20 % do not have acute pain, though they may suffer perhaps from indigestion, with intolerance to certain foods, such as eggs, fats, and so on. It is stated that the colic is most often referred to the right upper abdominal quadrant, but in my own experience of eight cases in which stone was found only in the common duct the pain was referred to the epigastrium and radiated through to the back between the shoulder-blades.

Chills and Fevers (Charcot's Intermittent Hepatic Fever) due to Cholangitis and Hepatitis.—In Lahey's series chills and fevers were present in only 4.2 % of cases—a remarkably low figure which was attributed to the fact that a large proportion were operated upon early, and also to the practice of exploring the ducts in all biliary operations.

Duodenal Drainage.—Aspiration of the duodenal contents in Lahey's series yielded crystals of calcium or cholesterol in the drainage sediment in 30 out of 32 cases in which stones were found in the common bile duct at operation.

X-Ray.—Cholecystography is indirectly most helpful, but of course the dye does not outline the common duct. Sometimes if the stone in the duct contains enough calcium it may be made to show up and its position be located by the aid of barium in the duodenum.

Indications for Exploration of Common Bile Duct

At operation the following findings are suggestive of stone in the common bile duct: (1) Thickened and contracted gall-bladder. (2) Dilated cystic duct: normally the duct admits a probe with difficulty. (3) Dilated common duct (normally a quarter of an inch in diameter) which has lost its colour. Even in the presence of enormous

dilatation, as sometimes happens in carcinoma of the head of the pancreas, the duct will retain its bluish colour, but when dilatation is associated with stone and infection it alters to a pinkish grey or yellow.

Among my own cases there were eight in which stones were found only in the common bile duct. In five of these the gall-bladder had been removed at a previous operation. All these patients suffered from intermittent colic, the pain being referred to the epigastrium with radiation between the shoulder-blades. The pain was not referred to the right hypochondrium. In one case in which the common bile duct had been explored six months previously by a competent surgeon the severity of the colic combined with rigidity of the abdominal muscles led to a diagnosis of perforated ulcer; at operation the tissues surrounding the duct were oedematous and somewhat bile-stained, and a good-sized stone was found in the duct. Six of the patients complained of jaundice, but the other two remained free from this symptom throughout their illness. The gall-bladder in each of the cases in which cholecystectomy had not been performed was unmistakably pathological—shrunken, with thickened walls and altered colour—and the cystic duct in each was widely dilated as if its passage had just been forced by a stone. The gall-bladder in one case was no bigger than the terminal digit of a medium-sized finger, and would barely have accommodated the stone which it had apparently expelled into the common duct.

At operation the ducts must be palpated carefully for stone. The index finger of the left hand is passed into the foramen of Winslow and the duct carefully examined with finger and thumb, aided by the fingers of the right hand in front. Some surgeons prefer to carry out this examination standing on the left side of the patient, reversing the position of the hands for examination. If after careful palpation the operator is still in doubt bile should be withdrawn from the duct by a hypodermic syringe. Normal bile is clear, is golden yellow in colour, and stones will not be found associated with it. On the other hand, if bile is black or cloudy or contains flocculi, stones will rarely be absent from the duct.

It is unnecessary here to give the surgical technique of exploration of the common duct in detail. I do not use a bridge to elevate the costal margin, as anaesthetists find that it causes a fall in the blood pressure. It is better to explore the common duct through a separate incision than to attempt to explore through the severed end of the cystic duct. A suction apparatus should be in use, and, in addition to the usual packs, a small gauze pack should be inserted in the foramen of Winslow to prevent leakage into the lesser sac. Not only should the common bile duct be explored, but also both hepatic ducts for stones which escape upwards. This examination is done with a scoop or a Desjardins forceps. Elusive stones can sometimes be evacuated by flooding the ducts with saline and coaxing the stone towards the opening by means of the suction-tube inserted into the duct. Bougies should be passed down the duct to ascertain if the opening into the duodenum is patent, and dilatation of the sphincter of Oddi should be gently carried out with bougies—silk-web olivary bougies for preference, though some prefer to use Lister's sounds. Bougies greater than size 12 English or 22 French should not be used, for fatalities following excessive dilatation have been recorded. It may be added that the presence of the bougie in the lower end of the duct often materially aids palpation and helps to distinguish whether the particular swelling is inside or outside the duct.

It must be acknowledged, however, that even after the most careful exploration of the common bile duct by competent surgeons stones in the duct have been missed. There is, of course, the possibility that such stones have formed in the bile ducts themselves after the gall-bladder has been removed. The generally accepted view, however, is that stones are formed in the gall-bladder and pass on via the cystic duct to the common duct. Some hold opposite views and believe that stones originate—the nucleus of the stone, at any rate—in the intrahepatic ducts. The composition of gall-stones and the site of their formation, then, are not of purely academic interest.

Naunyn first advanced the theory that cholesterol stones were formed in the gall-bladder and that for their formation infection and stasis were necessary. In recent years his views have been ably supported by Sir James Walton, a surgeon of great experience. Aschoff and Baemeister maintained that a pure cholesterol stone is formed independently of infection, but that infection is necessary for the formation of a mixed stone. Boysen held the view that in all gall-stones there was a nucleus of pigment calcium, even in the so-called pure cholesterol stone. He had found small pigment-calcium stones in wholly normal gall-bladders, but cholesterol stones in inflamed gall-bladders. Rovsing agreed with Boysen that the primary factor was the formation of bilirubin-calcium stone, not in the gall-bladder, however, but by precipitation of bilirubin calcium in liver cells.

Lahey has recently added great support to the theory that stones can be formed in the ducts. He is convinced, from an experience amounting to 2,177 patients operated upon for gall-stones, that most common and hepatic duct stones are not produced in the gall-bladder but originate primarily within the common and hepatic bile ducts. "Again and again," he states, "have we found and removed stones in the common bile duct when the cystic duct was so small that even the smallest stone of bird-shot calibre would have trouble in passing through it." Rufanov (quoted by Walters) collected 57 cases of formation of stones within the intrahepatic ducts that had been reported in the literature, and reported 5 of his own.

Flint records an interesting case of a man who had four operations for biliary colic with jaundice and at each operation a pigment stone (or stones) was found in the common duct, the gall-bladder having been removed at the first operation. At the fourth operation the spleen was twice the normal size. Splenectomy rid the patient of his trouble, and he was alive and well fifteen years afterwards.

Cholangiography and T-tube Drainage

In recent years a method of visualizing the bile duct—cholangiography—has been introduced, a method which may in time solve this vexed question. An opaque solution is introduced direct into the common bile duct and a radiograph taken. Any stones in the duct show up as filling defects. This method can be utilized at the time of operation (immediate cholangiography) or the solution can be introduced later through the tube which has been used for drainage of the common bile duct (delayed cholangiography). Immediate cholangiography, which has been strongly advocated by Best, necessitates special *x*-ray arrangements in connexion with the operation table, and the surgeon must wait while the negative is being developed. A needle and 20-c.cm. syringe are used for injecting the opaque solution after the bile has been aspirated from the common bile duct. This ritual will hardly appeal to surgeons who are confident of finding stones in the common bile ducts without the aid of new-fangled methods, but even the most competent operators can be safeguarded against error if they will adopt the principle of using a T-tube for drainage on the common duct and carrying out cholangiography afterwards. The ordinary straight drainage tube used by surgeons is retained in the duct by a suture of plain catgut, as chromic gut has on occasions been found to provide a nucleus for stone formation. Plain gut dissolves in the course of

six to ten days, when the tube comes away. This period is inadequate for drainage in cases in which there has been cholangitis and hepatitis. A T-tube can be retained until the liver function has been restored to normal, and, furthermore, after an interval of twelve days, when the tube is firmly surrounded by the healing tissues, cholangiography can be carried out. If a stone has been overlooked and is discovered on *x*-ray examination it does not necessarily mean a further operation. There are now means at our command, through the aid of the T-tube, which may help to rid the patient of the stone without operation. The T-tubes supplied by manufacturers are invariably out of proportion, the cross-piece of the T being longer than the common and hepatic ducts combined. The whole circumference of the cross-limb is unnecessary,

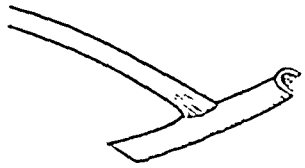


FIG. A.—T-tube prepared ready for use.

half the circumference being quite sufficient. This part of the tube should be whittled down until it measures no more than 1½ inches in length at the outside and half the circumference of the tube removed, for all that is required is a projecting shoulder on each side of the main stem to retain the tube in position (Fig. A). When prepared

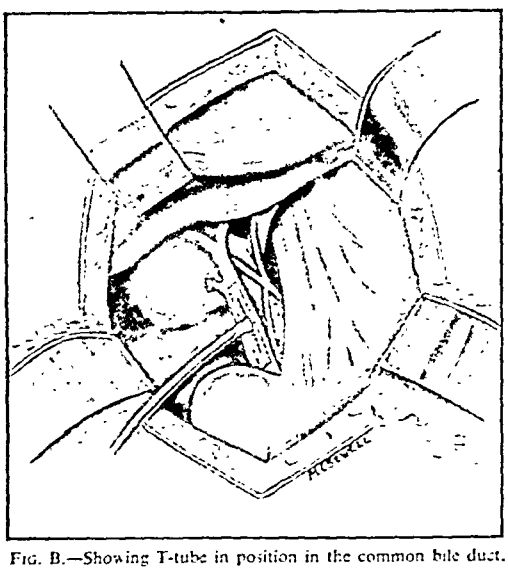


FIG. B.—Showing T-tube in position in the common bile duct.

in this way the tube is easy to introduce and is readily removed without causing the patient discomfort. The opening in the common bile duct is closed snugly around the tube and no stitch through the tube is necessary (Fig. B). An excellent type of tube is that used by Maingot, but, failing such, the operator can fashion one as described.

It is not expected, of course, that the T-tube should act as a drain for the operation area; this is provided for by a second tube which reaches down to the common duct and which for preference is brought out through a separate stab wound as recommended by Rendle Short.

The opaque solutions or contrast media most favoured have been thorotrast and lipiodol. I have already in this journal pointed out the objections to the use of these solutions. Thorotrast may be dangerous on account of its radio-active properties, and lipiodol, being thick and oily, does not mix well with bile and so filling defects may be mistaken for stones. I have tried uroselectan, but it is too apt to cause pain. Perabrodil I found quite satisfactory (see radiographs reproduced in Plate). To get the full opaque effect of the solution bile must first be aspirated from the common bile duct through the T-tube. The solution is first warmed to 100° F., then introduced from a sterile syringe. The usual amount introduced varies from 10 to 20 c.cm., about 15 c.cm. being the average, but in some cases in which the ducts were more than usually dilated -cases of cholangiectasis and hydrohepatosis—I have used as much as 35 c.cm. The injection is stopped as soon as the patient complains of discomfort in the epigastrium, and a radiograph is taken.

If stones are discovered by cholangiography the following methods of dealing with them are tried before a second resort to operation. Bile is first aspirated, then 1 to 2 c.cm. of ether is introduced and the tube is left open so that the ether, which readily vaporizes at body temperature, may not cause too much pressure within the duct. It is hoped by this means to dissolve the stone. Treatment can be repeated several times daily. Pribram, who has tried this method extensively, claims much success for it (stones dissolved in 38 cases). Walters and Wesson advise the addition of alcohol to dilute the ether, as well as the administration of amyl nitrite to produce dilatation of the sphincter of Oddi. In this way they were successful in fragmenting a stone which had been impacted in the ampulla of Vater and securing its passage into the duodenum.

By means of opaque media it is possible to study the effects of different drugs on the sphincter of Oddi. Amyl nitrite and nitroglycerin produce the greatest dilatation. Magnesium sulphate and fats, cream, olive oil, etc., also dilate the sphincter, but atropine is uncertain. Morphine, codeine, and dilaudid, contrary to what might be expected, produce spasm of the sphincter. Walters and others at the Mayo Clinic studied particularly the effect of morphine in 9 cases of biliary colic after the gall-bladder had been removed, and found that 1/6 grain of morphine sulphate produced pain, which was completely relieved by 1/100 grain of glyceryl trinitrate or by inhalation of amyl nitrite. Spasm of the sphincter of Oddi is probably the cause of clay-coloured stones observed in some cases after the administration of morphine. Best of Omaha, who had not had much success with the ether method, put these findings to good account in a number of cases. He combined the use of nitroglycerin, atropine, magnesium sulphate, and olive oil by mouth with the introduction of warm olive oil into the common bile duct through the T-tube.

I have tried the ether method without success, but in one case continued treatment on the lines laid down by Best, and was eventually successful in ridding the patient of her symptoms. The following is a brief history of the case.

A female patient, previously operated upon by another surgeon, when the gall-bladder, which contained stones, was removed; common bile duct not explored. Three months later recurring colic. Second operation (by me)—three stones removed; thought that another stone could be felt in the right hepatic duct further up, but all search proved unavailing. Bougies passed through ampulla into duodenum, and sphincter of Oddi dilated. T-tube inserted. Radiograph twelve days later: filling defect ampulla of Vater. Ether method tried unsuccessfully. Patient unfortunately had to be

evacuated from hospital and the T-tube was removed. While awaiting admission to another hospital she continued on treatment with nitroglycerin, atropine, magnesium sulphate, and olive oil. A few days before she was due to be readmitted to hospital she sustained severe colic followed by slight jaundice, and since then—now more than a year ago—has had no further trouble. I have no doubt that her attack signalized the passage of her stone into the duodenum.

How Long to Retain the T-tube

The question arises how long the T-tube should be retained in the common duct. One reads of cases, in America, in which it has been retained for periods varying from three months to a year. The time to remove the tube is when the concentration of bile salts in the bile has returned to normal. Following operation, whatever the condition of the liver, the concentration of bile salts falls for the first five days, a fall that is more pronounced if chloroform is the anaesthetic employed. The best anaesthetic would seem to be gas, oxygen, and cyclopropane. Febrile reaction following operation delays the return to normal. Unless the liver has been severely damaged by inflammation and back-pressure, the concentration of bile salts reaches normal about the fifteenth day, after which time it is safe to remove the tube. On the other hand, in cases in which there has been prolonged continuous or intermittent jaundice, particularly if associated with fevers and chills, it will be found that the concentration of salts will be delayed, and the tube may have to be retained for a much longer period as above mentioned.

I must offer a word of warning here against too prolonged and continuous drainage. In the case above recorded there was partial obstruction to the flow of bile into the duodenum. The tube was left to drain continuously, with the result that practically all the bile escaped externally; the patient at one stage showed rapid deterioration, and it was only by the use of intravenous saline and glucose and the administration of bile salts (veracolate) by mouth that we were successful in restoring her condition. Where there is not complete obstruction the tube should be closed at intervals to allow the bile salts to escape into the duodenum. If there is complete obstruction and the bile drains only externally, it is necessary to administer bile salts by the mouth and keep the patient as well as possible by other means until such time as a short-circuit or other operation can be done to divert the bile internally.

Jaundiced Cases

A certain proportion of surgeons have always been chary about operating upon jaundiced patients, because of the danger of haemorrhage—not vigorous haemorrhage from any particular arteries, but a continuous steady ooze from the tissues which is apt to continue after operation in such cases. This lack of clotting power is due to prothrombin deficiency and can be corrected by giving vitamin K in combination with bile salts by mouth before operation, the bile salts being necessary for the absorption of the vitamin from the intestine. Vitamin K for oral administration is supplied under the trade name of clotogen (Abbott). Another preparation—kapilon (Glaxo)—can be given by intramuscular injection. American writers, Whipple and Rhoads particularly, speak enthusiastically of this treatment, which can be enhanced by a blood transfusion before operation.

I believe that the danger of haemorrhage in jaundiced cases has been very much exaggerated—so much so, in fact, that in the minds of many newly qualified men there exists an almost superstitious awe of the consequences of surgical intervention. Personally I have never seen a case of jaundice in which a fatal ending could be attributed solely to haemorrhage following operation. No doubt such cases do occur, but some of them must be due to gross neglect of haemostasis. What does contribute more than anything else to a fatal ending in these cases is lack of adequate preliminary treatment and perhaps the efforts of the surgeon to attempt too much at operation. There is no necessity, for instance, to remove the gall-bladder when the patient is very ill and the urgent need is for relief of obstruction to the common duct. The gall-bladder can be left for another day. Where possible the patient should be put on a diet consisting of 75% carbohydrate, 20 to 25% protein, and not more than 5% fat for seven to fourteen days before operation. In cases of emergency, or if the patient is nauseated or vomiting, intravenous saline with glucose 5 or 10% should be given by the drip method, combined with blood transfusions. For further details of treatment I cannot do better than refer the reader to Flint's (1937) excellent paper.

Summary

Stone in the common bile duct is more often overlooked at operation than is generally realized.

Indications for exploration of the common duct for stone have been outlined—clinical features as well as conditions at operation.

Too much reliance must not be placed on the presence or absence of jaundice as a symptom. At a conservative estimate jaundice has been found to be absent in no less than one-third of the cases of stone in the common bile duct.

The use of a T-tube for drainage is strongly advocated, as it can be retained longer than the ordinary straight tube and so allows the liver a better chance of recovering to normal.

By means of the T-tube, (*a*) concentration of bile salts in the bile can be ascertained and an estimate be formed of liver function; (*b*) cholangiography can be carried out and any stones which have been overlooked detected; (c) treatment can be instituted to rid the patient of such stone without resort to further operation.

I wish to acknowledge my indebtedness to Dr. R. O'Donoghue and Dr. G. T. Loughborough for their kindness and help with the x-ray investigations.

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The Bath Medical Book Society held its hundredth annual meeting on December 13, 1940. The society was founded for the purpose of circulating some of the recently published medical books; each member keeps a book a fortnight and passes it on to the next name on a list arranged so far as possible according to residence. The number of members is limited to twenty-five, and new members are chosen by ballot as vacancies arise. This small society fulfils a useful purpose in the medical life of Bath. Mr. A. Leonard Fuller has served as its honorary secretary for thirty-six years.

DIRECT DRAINAGE OF LUNG CAVITIES IN PULMONARY TUBERCULOSIS

BY

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(WITH SPECIAL PLATE)

The direct drainage of lung cavities, introduced by Prof. Monaldi of the Forlanini Institute in Rome, would appear to offer interesting possibilities in the treatment of lung tuberculosis. Despite the constant improvement in the technique of the different methods of collapse therapy there remain many cases to which these methods cannot be applied. The direct drainage of a pulmonary cavity would seem to be a logical proposition, yet at first the idea of the transpulmonary drainage of a tuberculous cavity must cause some hesitation. The method and the theory on which it is based are founded on conclusions drawn from the work of Prof. Morelli on the mechanism of respiration.

Development of a Cavity

Two factors enter into the development of a lung cavity. The initial process is in the fine bronchioles or alveoli. Tubercles form which coalesce into consolidated areas. If the process is not arrested, caseation and softening, with involvement of the interstitial tissue, lead to the formation of a cavity. This is the first or biological factor. If it remains unchecked by the patient's resistance it will continue to predominate, leading to an extensive caseous process. However, in the great majority of cases the biological factor is modified and signs of defence are observed. Here the mechanical factor comes into play. Cavities, the dimensions of which may vary considerably from time to time, will often be observed in patients whose general condition is good and in whom there are but limited signs of activity. In these cases, in which the importance or variation in dimensions of the cavity would appear to be unaccompanied by proportionate signs of activity, the mechanical and not the biological factor seems to predominate. Poix and Vincent (1938) have studied these variations. The distinction is drawn between these cases and those in which the enlargement of the cavity is accompanied by signs of activity such as fever, increased cough, and sputum. The fluctuation due to the mechanical factor will be discovered radiologically and not clinically.

The traumatism to which a lung cavity is subjected during respiration has been studied by many. During the act of respiration the pressure exerted on the pulmonary parenchyma varies with inspiration and expiration. The lung is also in a state of constant distension. If there is a large drainage bronchus allowing free entrance and outlet the air pressure in a cavity will not be appreciably modified. If there is no drainage bronchus, or if the lumen is small or obstructed, the intracavernous pressure will be influenced during respiration. According to Monaldi, quoted by Arnould (1939), the partly obstructed bronchus will be found in the majority of cases. Even in the case of the large bronchus the passage of secretions can bring about intermittent obstruction. During inspiration the endocavernous pressure is diminished, whereas during expiration it is increased. The tissue surrounding the cavity is subjected to the opposing forces exercised by the expiratory process and the increased pressure in the cavity. The result is the development of atelectasis. The cavity is now less well protected from the traumatism caused by the thoracic traction and pressure during inspiration and expiration than if it were surrounded by healthy air-containing and elastic lung tissue. The increased traumatism leads to increased pressure on the pericavernous tissue, and so the atelectasis becomes still more pronounced. Monaldi has also drawn attention to the diminished circulation in atelectatic tissue. Reduced blood supply to the cavity hinders the patient's resistance and so facilitates the inflammatory factor.

The "fibrous ring" surrounding a cavity in relatively healthy lung tissue, sometimes alluded to in the interpretation of the pulmonary radiograph, would appear to represent atelectatic tissue and not fibrosis. It would seem clear that the permeability of the drainage bronchus plays a very important part. Some writers claim that it is an essential condition to the closing of the cavity. In fact, radiological observation shows that spontaneous closure is often preceded by the formation of an endocavernous fluid level. According to Corryllos, quoted by Arnould, the occlusion of the bronchus is followed by absorption of the air in the cavity, bringing about its diminution and closure. Nevertheless it cannot be readily accepted that the occlusion of the bronchus is essential. *X*-ray observation in a case of spontaneous healing will generally show that sputum diminishes in proportion to the diminution in the size of a cavity, and does not disappear until the cavity has finally closed.

A cavity must be possessed of a retractile quality if it is to close. The presence of atelectasis in surrounding tissue would appear to answer this need best. Post-mortem examination has proved the presence of pericavernous atelectasis. It may also be recognized in the radiograph. The rapid spontaneous closing of some large cavities would seem to be best explained by re-expansion of atelectatic tissue. The theory according to which the closing of a cavity is brought about by the contraction of fibrotic tissue has not been borne out by post-mortem findings. Rist and Rolland, quoted by Poix and Vincent, have described their post-mortem findings in the case of a large cavity which had completely closed. They found no evidence of fibrosis and no trace of the cavity. Similar observations have been presented by many others. Where fibrosis is observed it is usually star-shaped and does not correspond to the contraction of a fibrotic ring.

The disappearance of a cavity treated by an artificial pneumothorax maintained at negative pressures may be attributed to the re-expansion of collapsed alveoli. Collapse treatment has as one of its principal objects the elimination of respiratory traumatism, which, as has been seen, plays an important part in pericavernous atelectasis.

The cavity in which the mechanical factor has predominated is possessed of a retractile quality represented by atelectatic tissue. The cavity in which the biological element has been preponderant has not this quality. Such is the case in excavations in large caseous processes. The cavity in the advanced fibrotic lung also lacks this retractile quality, although the application of Monaldi's method to such cases will often show that there still remains a surprising possibility of retraction. The direct drainage of a tuberculous pulmonary cavity aims at combating the mechanical factor in the formation and maintenance of a cavity by producing a negative endocavernous pressure, facilitating the re-expansion of the peripheral atelectatic tissue, and so neutralizing respiratory traumatism. It seeks to overcome the biological factor by giving free outlet to inflammatory matter and debris and so deterging the surfaces of the cavity.

Drainage Technique

The instrument used consists of a trocar and cannula. The trocar is so constructed as to allow of the passage of

air between it and the cannula. The cannula has a lateral arm permitting its connexion to the manometer of a pneumothorax apparatus. The point of the trocar is but slightly bevelled.

If the technique of the method would appear simple, a strict attention to detail is essential. In the first place, it is of paramount importance to make sure that the lung is adherent to the parietal pleura in the region of the cavity. Only in the presence of adherent pleura may the method be applied. The extent of the adhesions must be such as to preclude all possibility of communication with an area where the lung is not adherent. Were this precaution not observed a pleuro-pulmonary fistula with all its consequences would be the result. The position of the cavity must be carefully studied by screen examination, as also on the radiograph. Tomographic plates will help towards a very precise location. The patient is placed preferably on an *x*-ray table permitting radiological control at each stage of the operation. The point of entry chosen will be between the anterior axillary line and the sternum, as this will best facilitate adoption of the recumbent position in the after-treatment. Most often the cavity is situated posteriorly, which is an advantage, as the drain will thus be introduced through healthy and elastic lung tissue. This will help to avoid the possibility of fistula and the escape of air around the drain. With the entry point decided on, the intercostal space is anaesthetized. The depth and position of the cavity are now controlled by the introduction of a long fine needle connected to a syringe. The syringe should be filled with fluid so as to avoid the possibility of introducing air into a blood vessel. As the needle is pushed gradually towards the cavity traction is made on the piston of the syringe. The free entry of blood into the syringe would indicate the presence of an important vessel. In this event the needle must be withdrawn and the entry point changed with a view to finding a less dangerous route. When the cavity is reached air can be drawn freely into the syringe. The direction of the needle is controlled by screen examination. If during the introduction of the needle no important blood vessel has been encountered the cannula may be pushed into the cavity. The direction and degree of penetration of the fine needle should be carefully noted before it is withdrawn. The track of the fine needle must be meticulously followed during the introduction of the cannula. While the cannula is being introduced the manometer is kept under observation. Small movements will be caused by the passage through alveoli. When the cavity is reached well-marked oscillations will be noted on the manometer. The correct penetration of the instrument may be controlled by the fluorescent screen. The trocar is now withdrawn. A suitable Nélaton catheter, No. 12, is introduced and the cannula is withdrawn carefully so as to leave the drain in position. The catheter is fixed to the chest by means of two strands of silk, twisted round each other and between which the drain is passed. The ends of the silk strands are fixed to the skin by adhesive plaster. A dressing is now applied, and the end of the drain is enveloped in the dressing.

The aspiration is not begun until twenty-four hours later. It may be effected by means of a small electric pump or a filter pump. The aspiration obtained by the difference of level between two vessels connected together, one of them filled with water, may be employed. This is an inconvenient method, as constant manipulation is necessary in order to maintain the difference of level. The electric pump is also suitable, but the apparatus tends to heat when used continually. The filter pump is the most convenient method of aspiration. The drain is connected to the aspirating apparatus shown in the diagram. It consists of a glass cylinder partially filled with water, approximately 75 cm. in length and 3 cm. in diameter. It is closed by a rubber stopper with two perforations, through which two glass tubes are passed. The short tube is connected to the closed aspirating circuit. The upper extremity of the long tube communicates freely with the atmosphere, whilst the lower extremity is plunged in the water of the cylinder. The degree of immersion determines the maximum depression desired. When the aspiration tends to become too strong atmospheric air is sucked through the long tube, thus limiting the negative pressure in the aspirating circuit.

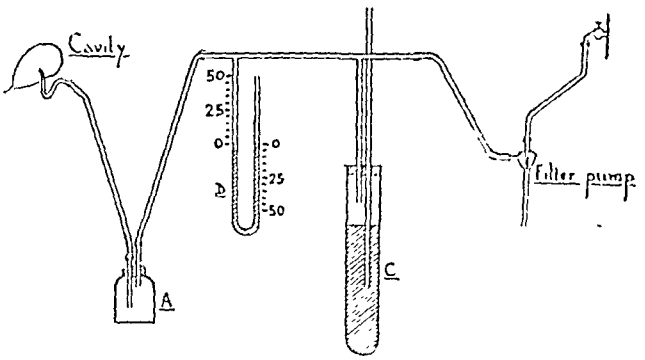


FIG. A.—Diagram showing method of drainage. A: Glass bottle which receives the matter aspirated from the cavity. B: Manometer graduated in c.cm. of water. C: Pressure controller (Jeanneret and Joyet, 1939).

During the first few days after the introduction of the drain a febrile reaction is generally observed. The matter aspirated, as also the sputum, is often blood-stained. It may be added, however, that often no trace of blood is seen.

The dressing must be changed daily, as strict asepsis is indispensable. The aspiration must be conducted very carefully and should be maintained night and day. It is usual to begin with a pressure of approximately −5. It must not be increased so long as the sputum or aspirated matter is coloured red. Once all signs of haemorrhage have ceased the pressure may be raised so as to reach −15 at the end of ten days. The degree of aspiration must depend on the clinical and radiological findings. If the suction is too intense the lung surrounding the cavity will tend to become opaque. This opacity would appear to be due to alveolar secretion, and diminishes when the aspiration is reduced. Care must be taken to avoid this complication, which could become very serious in cases in which the respiratory surface is already inadequate or in which the treatment is bilateral. The sputum, if it had its sole origin in the cavity treated, usually disappears almost at once. If not, it must be seen whether the drain is placed in its proper position in the cavity.

Frequent radiological examinations are necessary in order to carry out the treatment. At first the aspirated matter will be thick and the drain often become blocked. It may usually be cleared by means of a syringe. After the first few days the secretions become gradually more fluid, and finally all sediment tends to disappear. The suction may be increased gradually. The possibility of reaching a very negative pressure will depend on the permeability of the drainage bronchus. If the drainage bronchus closes a maximal pressure of −50 may be reached. In practice it would seem that the optimum figure is in the region of −20 to −30.

The decision to remove the drain requires careful consideration. It is not easy to decide whether the cavity has completely disappeared. Examination of the aspirated fluid will help in the decision. It will also be observed

that the drain may even hinder final disappearance of the cavity. When it is decided to withdraw the drain it is best to do so gradually.

Cases in which to apply Drainage

This method of drainage will be best applied to cases in which, as has been previously mentioned, the mechanical factor has predominated and in which there is peri-cavernous atelectasis. It may be employed to advantage in many cases in which the tissue surrounding the cavity appears to be fibrous. Its application in such cases has shown that there often remains a surprising possibility of retraction. In the case of some giant cavities, in which treatment by aspiration offers but slender hope of a complete result, drainage treatment can improve the patient's general condition and, by reducing the size of the cavity, render surgery more feasible.

In patients subject to frequent haemoptysis or in cases with marked dyspnoea the decision to apply the method must necessarily be a difficult one. A cavity of too small dimensions would make the introduction of the drain impossible. Cavities situated close to the hilus or to the mediastinum should generally be avoided, as their position renders the operation too dangerous. Provided that the details of the technique are carefully observed and that the respiratory balance is not too greatly compromised, the method may be applied to both lungs simultaneously. It may be added that in the case of a cavity with a free drainage bronchus a too rapid aspiration may lead to dyspnoea, sore throat, and dryness of the mouth. The dangers suggested by the puncture of the lung would appear to be attenuated by practice of the method. The risk of embolism is lessened by keeping the exploratory needle and syringe filled with fluid. Exploration by means of this needle will show whether there is an important vessel in the proposed course of the trocar and cannula. Haemorrhage would nevertheless appear to be the principal danger, and its possibility must be constantly borne in mind. The risk of a pleuro-pulmonary fistula is ruled out by making sure that the pleura is adherent. In practice the external fistula causes no trouble if the dressings are carried out often enough. This fistula tends to close round the drain rather than to increase in diameter.

It is as yet impossible to appreciate fully every aspect of Monaldi's method. The question of the complete and durable closure of the cavity can only be answered by fuller observation. That remarkable and rapid improvement may be obtained would appear to be certain. This result can render collapse treatment feasible, and therein would appear to be one of the chief indications for the use of this method.

Case Reports

Case 1.—Large cavity of right apex. Complete rest treatment extending over a period of sixteen months. A.P. impossible. Phrenic evulsion done without result. Surgical treatment impracticable. Fig. 1 on Plate shows size of cavity eight days before operation. Drain introduced July 12, 1939. Febrile reaction reaching 102° F.; temperature normal five days later. Aspirated matter slightly blood-stained during first three days. Immediate cessation of sputum. Fig. 2, taken December 6, 1939, shows that the cavity has almost completely disappeared. General condition now excellent; aspirated matter very fluid, and negative on repeated analysis; wound in good condition.

Case 2.—Giant cavity of upper third of left lung. Smaller cavity in right apex. A.P. impossible. Surgical treatment impracticable. Fig. 3 shows size of cavity seventeen days before operation. Drain introduced August 14, 1939. Slight febrile reaction lasting four days. Fig. 4 taken January 30, 1940: the cavity is still visible, but has greatly diminished in size; wound in good condition.

Case 3.—Giant cavity in upper portion of left lung. A.P. impossible. Surgical treatment impracticable. Drain introduced October 23, 1939. Febrile reaction reaching 103° F., lasting three days. Fig. 5 shows cavity eight days after drainage. There is a small cavity just below, and masked by, the cavity treated. Fig. 6, taken on January 30, 1940, shows that the cavity has almost disappeared: the smaller cavity, no longer masked, is more visible; and the wound is in good condition.

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FEMINISM

BY

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(WITH SPECIAL PLATE)

In contrast to our series of cases of virilism in women which we have published at different times from Charing Cross Hospital we have for several years been observing the rarer and opposite condition of feminism in the male, a case of which is here described.

Case Report

The patient, who first presented himself in 1933, was so distressed about himself in 1939 that he threatened to take his life unless something was done. His plight may best be described in his own words:

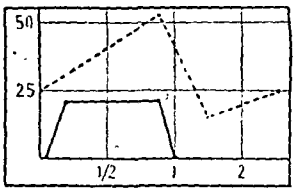
> "Since the age of 13 I have never developed: my voice has not broken, I am physically still a small boy, and in the present state have not a man's strength and can never hope to get married, although I do get sexual feelings at periods. I cannot associate with men because they think I am a lad and address me as 'Son,' 'Lad,' or 'Boy'; neither can I associate with youths, as I have got past their stage of life mentally and they are in fact too full of life for me. I have tried many treatments, but to no avail, and I think I have to go through life as another Peter Pan, the boy who never grew up. I have never shaved yet, and am practically hair-free on the body. I am beginning to dread the thought of going through life as a bachelor. I have seen other boys grow up, get married, and have children, and I would like to be the same as they."

When seen in 1933 he was 32 years old. His family history was normal, and his brother was the champion boxer of the Southern Command. At the age of 12 he had had diphtheria, and says that he had also had what was called mumps when 12, and again at 13 and 14, but it did not involve the testes. He never developed normally at puberty, and at the age of 22 began to grow a few hairs; he has never shaved, his voice has not dropped, and when 23 he grew five inches in height.

Physically his bodily contour was then distinctly feminine; he was 5 ft. 5 in. in height, his weight 8 st. 5 lb., and his pelvic girdle (31 in.) wider than the pectoral (30 in.). His external genitalia were small—the penis was about 2 in. long, his testes were descended and about the size of hazel-nuts—and he had a few sparse pubic hairs. In his manner this young man gave the impression that he was still psychologically at the age just previous to puberty. His sexuality was more or less neuter; he had an occasional erection but never any emissions. His mentality was good, but his temperament somewhat unstable; he was self-conscious, timid, and nervous in the dark. He was a house-painter and decorator by trade, and was keen on swimming. Although his skin was smooth there was no breast enlargement or that sleek adiposity of the eunuchoid type which we have observed in cases of bilateral torsion of the testes at an early age, so that it appeared improbable that he had suffered from orchitis as a result of mumps.

In 1933 he was admitted to hospital, and investigations gave the following results:

A blood analysis showed: urea, 29 mg. per 100 c.cm.; cholesterol, 0.13%; phosphorus, 5.28 mg. per 100 c.cm.; calcium, 9.52 mg. per 100 c.cm. A radiograph of the pituitary fossa was normal. A fractional test meal gave the following result:



Uroselectan *x*-ray findings were normal, but there was a calcified mass below the right kidney.

A blood count showed: R.B.C. 4,880,000 per c.mm.; Hb. 94%; C.I., 0.9; W.B.C., 7,200 per c.mm.; polymorphonuclears 57.34%, large hyalines 6.00%, small and large lymphocytes 36.37%. Blood platelets amounted to 200,000 per c.mm., and the coagulation time was 4½ minutes.

The Aschheim-Zondek and Wassermann reactions were negative. The basal metabolic rate was 7%.

He had previously been treated with hormones for two years at another hospital, and we had decided that should a suitable patient present himself at hospital offering testicular grafts we should adopt this form of treatment. He then had injections of testosterone, and in 1934 bilateral testicular grafts were implanted in both his flanks at the Middlesex Hospital; early in 1939 he had "tablets" placed under the skin of his abdominal wall.

In May, 1939, he presented himself again at our hospital. His condition was *in statu quo*, and in view of his previous treatment we suggested that his adrenal cortex might be involved in the syndrome, and although we could make no promise of a satisfactory result he welcomed the idea of unilateral adrenalectomy, realizing that it was entirely in the nature of a test case. He was now readmitted into hospital. Laparotomy revealed that both adrenals were larger than normal. A fortnight later (June 16) the left adrenal was removed and the patient made a satisfactory recovery. The immediate result of operation was a chordee which lasted for a day and a half.

Histological examination by Dr. Vines showed that the cortical cells were normal, but that they gave the positive Ponceau-fuchsin reaction, but of moderate degree, which we have previously illustrated in the *British Journal of Surgery* (May, 1939) in association with different degrees of virilism in the female (Broster, 1939).

In addition we were also enabled, as a result of the Wakefield Research Fund, to carry out biochemical tests. Dr. Patterson's results from urinary analyses may be tabulated as follows (Broster and others, 1938):

	Pre-operative		Post-operative
	Mg. Sterone per diem		Mg. Sterone per diem
Sterone Colour Test:			
22/5/39	7.8	23/6/39	4.0
23/5/39	6.7	27/6/39	5.2
24/5/39	8.5	28/6/39	4.3
25/5/39	6.9	3/7/39	5.9
26/5/39	8.5	15/3/40	8.6
30/5/39	7.1		
31/5/39	8.8		
Average ..	7.7	Average ..	5.6
	I.U. per diem		I.U. per diem
Biological Capon Test: Collection 22-25/5/39	28	Collection 23-28/6/39	18
Oestrin: Collection 22-25/5/39	85	Collection 23-28/6/39	83

The normal control figures for the colour test in the male are 9 to 20 mg. sterone daily, and in the female 4 to 14.6 mg. daily; so it will be seen that the average figure in this case is definitely on the low side. We ourselves have not done nearly enough controls to establish the exact normal ranges for androgens as determined by the capon test, but, taking a line through other people's results obtained from fairly extensive investigations into the normal, it would appear that the normal male range is something like 20 to 100 units a day, and the normal female 10 to 50 units. The oestrin figures show that there was no excessive output and no appreciable alteration as a result of the operation.

Clinical After-results

A letter received from the patient three weeks after the operation said: "I am certain there is already an alteration in my voice; hair has grown on my hands and on my arms, now an inch long." A month later he reported to the out-patient department; his voice had dropped, and he had shaved three times. It was not till January, 1940, that he reported again, looking much more manly and confident. He asserted that he had grown an inch since his operation, his appetite was enormous, and he had put on a stone in weight. The scrotal sacs were fuller and corrugated much in the same way as obtains after pregnyl injections. His penis had doubled in size; there had been erections but no emissions.

He was seen about the time of his operation and again in February, 1940, by my psychological colleague Dr. Clifford Allen, who reported:

"He has lost his shyness and will approach anyone without nervousness. He is more fidgety but less energetic at his work, and more keen to enjoy his pleasure. His moods fluctuate rather more than before his operation, but mainly concerning the possibility of a cure of his condition. There is no doubt that his operation has made a considerable difference in his personality. He is bolder, more self-reliant and self-assertive, and less secretive. He has attempted more sexually, and with success, than ever before, and is definitely more normally heterosexually inclined. Even his dreams and fantasies show this. The exact significance of his emotional shifting from his work to his pleasure is not yet clear."

Discussion

The detailed investigations of this case have been set forth in accordance with the routine which we had established for virilism in women. It came both as a surprise and a paradox that the opposite condition of feminism of the male should resemble the masculinization of the female so closely, both with regard to the presence of the Ponceau-fuchsin stain in the cells of the adrenal cortex and in the decrease in the amount of sterone after operation. It may be, as Vines suggests, that in all these cases of sexual disturbance of apparent adrenal origin there is an underlying dispituitarism which we have been unable to assess; but from a purely chemical point of view the findings might be harmonized with the theory, which has been advanced from time to time in regard to steroid metabolism, of the existence of a common precursor of androgenic, oestrogenic, and adreno-cortical hormones.

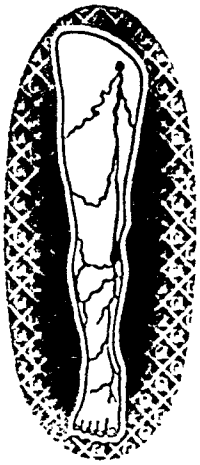
These comparative investigations are of considerable interest to the question of androgenic activity in both sexes from the adreno-cortical point of view, but although improvement has been maintained further progress does not seem likely after a year, and his age is against him. How far the adrenal cortex alone is responsible for the syndrome and whether secondary endocrine compensation takes place are matters for the future to decide.

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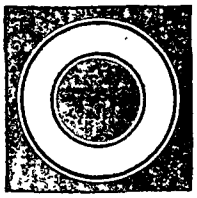
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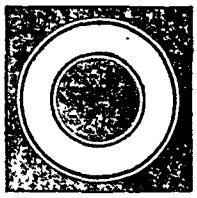
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A PROSTHETIC ULCER OF THE MOUTH

BY

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(WITH SPECIAL PLATE)

Benign tumours of the buccal cavity are uncommon. In two recent years 660 cases of disease of the mouth were examined at the Holt Radium Institute, and only 80 of them were non-malignant. Of these non-malignant cases 20 proved to be benign tumours and the remainder were inflammatory. Malignant growths therefore formed 97% of tumours in the buccal cavity, and 3% were innocent. These innocent tumours are important, however, because unless recognized they may receive unnecessarily drastic treatment, and if radiotherapy is used there will be little effect upon the growth.

One tumour, running true to type and possessing well-defined characteristics, has occurred often enough to merit description, especially as it has been invariably suspected of malignancy. Current surgical textbooks and literature do not mention this swelling, but a search through dental writings has revealed a description of a case by Thoma (1934).

The swelling lies in the sulcus between the cheek or lip and the gum, and is situated anteriorly to one or other side of the midline. It is much more common in the lower than in the upper jaw, and in women than in men. A series of ridges are formed which run parallel to the line of the alveolus and are slightly deeper in colour than the surrounding mucosa (Plate, Figs. 1 and 2). There are always two or more ridges, about an eighth of an inch in thickness and as much as a quarter of an inch in height, and after running for an inch or more along the gum they gradually slope away into the normal tissues. The ridges are covered with mucous membrane, but in the furrows ulceration exists in the deeper parts. On palpation the tumour is surprisingly hard, and this undoubtedly gives rise to the suspicion of malignancy. Very little movement on the deeper tissues can be detected because the swelling is anchored to the alveolus by the innermost furrow. There is little tenderness except during attacks of inflammation, which occur at infrequent intervals. It is only during these attacks that pain is experienced, and the main complaint is inconvenience, with a feeling that "this swelling ought to be attended to because it might lead to cancer." The patient is past middle life, and the gum is always edentulous. Advanced atrophy of the alveolus makes the denture very loose-fitting, and it will slip into any one of the furrows without inconvenience to the patient. The denture is an old one and has never been remodelled. The atrophy of the edentulous alveolus and the wearing of the loose-fitting denture are the cause of this variety of prosthetic ulcer, the "hit-or-miss" fit explaining the number of the ridges.

On microscopical examination the epithelial surface is irregular, but, although it extends fairly deeply into the underlying stroma, it is everywhere limited by a definite membrana propria. The underlying stroma shows scattered blood sinuses with occasional foci of lymphoid cells indicative of chronic inflammation.

The diagnosis from carcinoma is not difficult, but the patient usually presents himself when there is an acute attack of inflammation. The tumour is then reddened and angry-looking, with ulceration between the ridges. He has discarded his denture, and therefore the mechanical cause of the condition is not at once evident. The extreme hardness of the swelling and the induration of the base due to the ulceration in the furrows still further suggest the diagnosis of malignancy. On the other hand, the growth has been present many months—often one or two years. The hypertrophied portions are not friable, and bleeding does not occur. The ulceration is confined to the deepest portions of the furrows, and if the denture is obtained it will be found to fit accurately in any furrow. Finally there is no involvement of the regional lymphatic glands.

I have had 12 cases of this condition under my care in the past seven years, 9 of the patients being females and 3 males. Their ages ranged from 41 to 75 years, the mean being towards the end of the sixth decade. All were completely edentulous, and the original false teeth with which they had been supplied had been worn from five to twenty-six years. The atrophy of the alveoli was very advanced, the denture fitting loosely and slipping about whilst the patient was talking. Normally the lower denture in an edentulous mouth is much less secure than the upper, and this additional factor of instability would explain why in 10 cases the lower jaw was affected and in only 2 the upper. The tumours had been present from two months to five years, with the majority of patients seeking advice from six months to two years after noticing a swelling. In 2 cases the onset was painful owing to the pressure of the denture, but pain was infrequent and never severe. None of the patients suffered from gingivitis or stomatitis, nor was there any evidence of previous syphilitic infection.

The histories of the two cases illustrated are as follows:

Case 1.—A shopkeeper aged 62 had worn the same dentures for fifteen years. Two years before attending the hospital he developed a painful swelling "like a gumboil" on the inner aspect of the left lower lip. The swelling slowly increased in size, and was painless except when attacks of inflammation occurred. It had always been hard: there was no discharge and no bleeding. The patient was a teetotaller, did not smoke, and the Wassermann reaction was negative. On examination there was a typical prosthetic ulcer in the left lower alveolar sulcus 2.5 by 1.5 cm. in size (Plate, Figs. 1 and 2). The lower denture was very loose-fitting and slipped in and out of the furrows of the ulcer. There were no palpable lymphatic glands. The ulcer was excised with the diathermy loop and microscopical examination confirmed the clinical diagnosis. The wound healed in six weeks and the wearing of the remodelled dentures was resumed six months afterwards. It is now seven years since the operation, and there has been no recurrence.

Case 2.—A housewife aged 45 had had all her teeth extracted nine years previously and the dentures she then obtained had not been altered. Twelve months before coming to hospital she noticed a small hard painless swelling on the inner side of the left upper lip (Fig. 3). This swelling had doubled in size in the twelvemonth and was painless except when the teeth were pressed into it. There was no discharge or bleeding. She did not smoke or take any form of alcohol, and there was no suggestion of syphilis. On examination a typical prosthetic ulcer was found in the left upper alveolar sulcus 2.5 cm. in length. The upper denture was loose and slipped down whilst the patient was talking. There was no enlargement of the neighbouring lymphatic glands. The ulcer was removed by diathermy in November, 1934, and the wound healed in just over a month. Histological examination confirmed the clinical diagnosis and there has been no recurrence. New dentures were obtained and worn six months after operation.

The best treatment proved to be excision of the ridges with the diathermy loop, and the base of the tumour was very lightly coagulated with the diathermy button (evipan anaesthesia was used). Healing took place in about a month, with very little scarring, the only treatment

required after operation being bland mouth washes. All the patients were warned before operation that they would require a new denture or remodelling of the old one, and wearing of the teeth has been deferred until six months after the healing of the wound. One case had been previously treated elsewhere as malignant disease, and received an efficient implant of radium element giving a dosage of 6,000 r. It was interesting to find that the tumour had proved completely resistant, although a certain amount of troublesome necrosis had occurred in surrounding normal tissue.

Summary

A type of benign prosthetic ulcer of the mouth is described.

It is suggested that its relative frequency, trueness to type, and well-defined characteristics warrant its recognition as a definite clinical entity.

The causation, pathology, and treatment are discussed.

REFERENCE

Thoma, K. H. (1934). *Clinical Pathology of the Jaws*, Baillière, Tindall and Cox, London.

Clinical Memoranda

Irreducible Intussusception in a Baby, treated by Resection: Recovery

(WITH SPECIAL PLATE)

The problem of irreducible intussusception has evoked a variety of surgical methods, all more or less unsuccessful. In small children the mortality is very high. Perrin and Lindsay (1921) in a series of 400 consecutive cases of intussusception in the London Hospital give these mortality figures for irreducible cases: all cases treated by resection, 70%; cases under 3 years old treated by resection, 100%; cases treated by other methods, 100%. The conclusion one draws is that resection, though very unlikely to succeed, is the only method worth attempting. The following case was successfully treated by resection in Addenbrooke's Hospital in May, 1940.

CASE RECORD

The patient was a boy of 18 months, previously quite well apart from bronchitis. He was admitted with a history of abdominal pain, severe vomiting, and absolute constipation for four days in spite of enemas. Castor oil had been given at the onset. He had been passing small quantities of blood for two days. On admission he was dehydrated, the abdomen was distended, with a step-ladder pattern on it, and a mass could be felt in the right iliac fossa. The pulse was 160.

Operation was carried out under ether anaesthesia. An ileo-colic intussusception was found, beginning about twelve inches above the ileo-caecal valve and extending to the hepatic flexure. As only a few inches of this could be reduced and the part was gangrenous and was considered quite unviable the whole mass was resected between clamps. Anastomosis was done between the side wall of the ileum above the closed end and the open end of the colon a short distance below the hepatic flexure. The child's condition was not alarming at the end of this operation.

Intravenous saline and glucose were given continuously for six days, the child's leg being immobilized in plaster for this purpose. A nasal tube was passed and the stomach contents were removed. The fluid withdrawn was at first offensive and dark brown, and it remained so for three days. On the second day he passed an offensive dark-coloured stool. On the third day the abdomen was less distended and he had a mild attack of diarrhoea. On the fourth day he was taking half an ounce of fluid hourly by the mouth. Convalescence was complicated by a mild attack of measles, with bronchitis and otitis media, but he was in good health when he left the hospital four weeks after the operation.

Anterior and posterior views of the resected piece of bowel are shown in Figs. 1 and 2 of the Plate.

H. T. LAYCOCK, M.A., M.B., F.R.C.S.,
Resident Surgical Officer, Addenbrooke's Hospital, Cambridge.

REFERENCE

Perrin, W. S., and Lindsay, E. C. (1921). *Brit. J. Surg.*, 9, 46.

Multiple Foetal Abnormalities

(WITH SPECIAL PLATE)

In view of the unusual and extensive type of abnormalities in the case described, I consider that it merits record. Careful search in the literature through the good offices of the librarian of the B.M.A. has failed to reveal a similar case with such extensive deformity.

CASE REPORT

Mrs. ——, aged 33, has an only child of 4 years, who is apparently normal in every way. Since this child was born she has had a normal menstrual history, and used no contraceptives. She can recall no personal accident or untoward incident during the second pregnancy such as might give rise to a monster.

The confinement, at a maternity home, was a breech presentation with extended legs. No foetal heart sounds were heard. Under general anaesthesia a foot was brought down, the breech delivered, and the first abnormality displayed itself as a hernia of the liver covered by peritoneum through the abdominal wall (see Plate). There was a deficiency in the chest wall, involving the third, fourth, and fifth ribs, through which the heart and pericardial sac protruded. Finally careful delivery of the head showed a condition of hernia cerebri. The vertex of the foetal skull was absent and the free skull border appeared continuous and apparently fused with the amniotic membrane, which enclosed the brain substance. The brain was normal on section. Beyond this was the placenta, firmly attached. The face showed double harelip and cleft palate. The foetal skin was clean and intact and of normal appearance. The foetus showed no sign of life. There was at least fourteen to eighteen pints of liquor amnii.

Ante-natal care had shown a consistently normal urine and blood pressure, with breech presentation, but this was not interfered with.

I beg to thank Dr. Burn, medical officer of health, Barnsley, for the photograph and for his general interest in the case; also Dr. Rose.

Barnsley. A. B. SLACK, M.B., Ch.B.

A Case of Unilateral Twin Ectopic Pregnancy

(WITH SPECIAL PLATE)

Unilateral twin ectopic pregnancy is a comparatively rare condition. Falk and Blinick (1938), having reviewed the literature and described two cases of their own, state that 65 authentic cases had been reported. Anderson (1939) describes a case of his own.

CASE REPORT

A woman aged 24 was admitted to the North Riding Infirmary, Middlesbrough, on August 20, 1940, with the following history. She vomited in the morning and had pain in both sides of the lower abdomen which sometimes passed round to the back. This pain was severe and persistent, and on admission rose in the abdomen almost to the costal margin. There was a history of two months' amenorrhoea. She had had two children, the youngest being 18 months old.

On examination the patient was markedly exsanguinated, cold, and sweating, and the pulse was rapid and weak. There was a slight blood-stained discharge per vaginam. The diagnosis of a ruptured tubal pregnancy was made and the patient was taken to the theatre immediately. Under general anaesthesia the abdomen was opened and the diagnosis confirmed. The peritoneal cavity was filled with blood; the right Fallopian tube was ruptured and the bag of membranes was found intact. Right salpingectomy was performed. The ovaries and left Fallopian tube were normal. An autotransfusion of blood was carried out. When the unruptured sac was opened clear

liquor amnii escaped, and the condition was seen to be that of uniovular twin pregnancy (see Plate).

The patient made an uneventful recovery and was discharged from hospital twenty-two days after operation.

I am indebted to Mr. D. C. Dickson for permission to publish this case.

WILLIAM C. SMITH, M.B., Ch.B.,
House-surgeon, North Riding Infirmary, Middlesbrough.

REFERENCES

Anderson, D. F. (1939). *J. Obstet. Gynaec. Brit. Emp.*, 45, 756.
Falk, H. C., and Blimek, G. (1938). *Amer. J. Obstet. Gynec.* 35, 1053.

Twin Pregnancy after the Menopause

The following case may merit record by reason of two unusual features—namely, the occurrence of conception after the menopause and the birth of twins when an *x*-ray photograph, taken about the eighth month of gestation, showed only one foetus.

CASE REPORT

A woman aged 41 had previously had three single pregnancies, her youngest child being 8 years old. Her mother had had three sets of twins and a sister one set, the latter being stillborn. The patient menstruated regularly up to the age of 38 and thereafter at increasingly infrequent intervals and with decreasing loss until about the middle of 1939, when the periods entirely ceased. About June, 1938, she began to have certain menopausal symptoms—e.g., hot flushes, slight vertiginous attacks—and believing herself to have outrun her period of productiveness relaxed the contraceptive measures she had employed since the birth of her last child.

The first intimation that she was pregnant occurred when she observed foetal movements; she reported for examination on March 15, 1940, and was considered to be between four and five months pregnant. Later, on account of undue abdominal enlargement and the multiplicity of foetal limbs, the possibility of a multiple pregnancy was entertained, although at no time could more than one foetal head be palpated. At about the eighth month an *x*-ray photograph clearly showed a single vertex presentation. On the strength of this the woman was informed to expect only one child, and made her plans accordingly.

At term abdominal distension was marked, but this seemed to be accounted for by a fair degree of polyhydramnios. Labour was short and easy. A few mild abdominal pains during the night were followed by one or two short decisive pains in the morning, and the expulsion, vertex first, of a living male child weighing 5¼ lb. No escape of waters was noticed previous to the birth of this child. A short umbilical cord was ligated, and the arrival of the placenta awaited. The uterus at this time was disproportionately large and very hard, and for the next half-hour the mother experienced moderately severe bearing-down pains, in spite of which the placenta failed to appear. The pains ceased more or less abruptly, and it was then found that there was a bag of membranes high in the vagina, with a foetal head above it. The membranes ruptured on slight pressure, releasing a large gush of waters. The pains immediately reappeared, and a living male of 5¼ lb. was expelled, vertex first, quickly followed by a uniovular placenta.

That conception can occur after the onset of climacteric amenorrhoea is an established medical fact, but in view of the popular belief that this symptom marks the end of reproductive life it would be interesting to know if there are any criteria which unquestionably denote that further production is impossible. If none exist it means that a woman who has planned the size of her family over many years may be faced with a perhaps unwelcome addition at a time when she is less fitted for the extra responsibility, or alternatively that she must carry contraception into her dotage.

With regard to the radiograph, I have eliminated any possibility of exchange of plates, and, in view of the presumed unimpeachableness of the *x*-ray plate in the diagnosis of multiple pregnancy I should be interested if any of your readers can offer an explanation.

I am indebted to Dr. A. I. Maclean of Newton-le-Willows for permission to publish this case, which I saw in his absence.

Manchester. LESLIE BALLON, L.R.C.P. & S.Ed.

Reviews

CHARLES WATERTON

The Squire of Walton Hall. The Life of Charles Waterton. By Philip Gosse. (Pp. 324; 1 colour plate and 7 half-tone illustrations. 15s. net.) London, Toronto, Melbourne, and Sydney: Cassell and Co., Ltd. 1940.

The name of Charles Waterton is known to everyone who loves to read of travels in unknown countries. He wrote of his wanderings in South America, where he went as a young man to get curare, or wourali, the native arrow poison used in British Guiana, which he thought might be useful in the treatment of hydrophobia. The joys of travel became a part of himself, and during the remainder of his life he was rarely at home for any long period. The Rev. J. G. Wood and Sir Norman Moore have given accounts of him, but he had no connected biography until Dr. Philip Gosse wrote this excellent account of *The Squire of Walton Hall*. Born in 1782, he died in 1865. Waterton came of an old Yorkshire family and was endowed with a competence which enabled him to maintain his position as "the Squire." Dr. Gosse shows him as a man of many parts. A lover of birds and trees, he was the first to make the park round Walton Hall, his ancestral home, into a sanctuary for birds. He was a skilled taxidermist, a naturalist without much scientific knowledge, a Roman Catholic, adhering strictly to the old faith, and of a freakish humour. Had he been given the opportunity he might have done much to help in the advances made by his contemporaries Darwin, Wallace, and Huxley, but he was lacking in a scientific training. For medical men his methods are full of interest. Dr. Hobson, his physician, who practised at Leeds, records that he saw Waterton, then aged 77, scratch the back of his head with his right great toe. His toes indeed must have been prehensile, for to the end of his life he was active in climbing tall trees. During his early life in the South American forests he walked barefoot and does not appear to have felt pain or what to most people would have been extreme discomfort. He slept habitually on the floor of an attic at Walton Hall with a block of wood as a pillow and wrapped himself in a cape for covering. He ate but little and, on advice given to him when a young man by Sir Joseph Banks, he abstained from every form of alcohol. He suffered from repeated attacks of ague, for the relief of which he took Jesuits' bark, bled himself copiously and repeatedly, often with a blunt lancet, and purged himself with strong cathartics; yet in spite of it all he lived into his eighty-third year.

Dr. Philip Gosse has written an interesting book which will be read by different classes of readers—by some for the accounts of the travels, by others for the portrait of an unusual personality. The notes made by Sir Norman Moore, some of which were utilized in the *Dictionary of National Biography*, have been placed at the disposal of Dr. Gosse by Lady and Sir Alan Moore. Incidentally, it is stated in the volume that Sir Norman Moore came of Quaker stock. The Moore family is not Quaker, though Sir Norman's mother came of Quaker stock. There are reproductions of Waterton's portrait in the National Portrait Gallery and of Percy Fitzgerald's sketch, which is a caricature.

ONE HUNDRED YEARS OF A MENTAL HOSPITAL

The Chronicle of Crichton Royal. The Story of a Famous Mental Hospital during its First Century. By C. C. Easterbrook, M.A., M.D., F.R.C.P.Ed. (Pp. 675; 104 illustrations. 25s. net, postage 9d. extra.) Dumfries: Courier Press. 1940.

The famous mental hospital, Crichton Royal, Dumfries, was founded one hundred years ago on the initiative of Elizabeth Crichton, a contemporary of Elizabeth Fry and worthy to rank with her in the annals of philanthropy. Mrs. Crichton devoted to this purpose a bequest of about £100,000 of her late husband, Dr. James Crichton. The *Chronicle of Crichton Royal*, which Dr. Easterbrook, who was its physician-superintendent for thirty years, has most painstakingly compiled, is a worthy record of a great institution which was declared at its opening in 1839 to be the most perfect of its kind in Europe. From the first it exemplified the humane and rational treatment of the insane, of which Tuke at the Retreat in York and Pinel at the Bicêtre in Paris were pioneers. They had no more convinced disciple than William Alexander Francis Browne, first resident physician at Crichton and father of the late Sir James Crichton-Browne. Dr. Browne not only dispensed almost entirely with mechanical restraints but he was the first to introduce a system of occupations and amusements for patients. In 1843 the first theatrical performance ever given in an asylum—a farce in which all the characters were taken by patients—was staged at Crichton, and in the following year the first journal of prose and poetry contributed by asylum patients was published there. These facts are mentioned by Sir James Crichton-Browne in a foreword which he contributed to this volume just before his death.

Dr. Easterbrook unfolds the story of Crichton year by year, devoting to each year a separate chapter. The contents of each of these hundred short chapters are arranged in a uniform series of sections—the list of trustees, directors, and officers, statistics of patients, particulars of accommodation, innovations in treatment or nursing, clinical and laboratory investigations, commissioners' reports, and any new legislation affecting the treatment of the insane. A footnote of general history is appended to each chapter so as to give a background of contemporary events. Thus it is a book not to be read right through, but a work of reference to be consulted, as it were, either in vertical section for the happenings of a particular year or in horizontal section to trace any particular development. The author, as is natural, devotes a good deal of attention to the period of his own superintendency, 1908–37, during which time 8,500 patients were under treatment. The recovery rate was 37%, with very little difference between male and female. He notes that the recovery rate of the voluntary patients exceeded that of the certified by only 5%—a circumstance to be attributed, he says, to the increasing tendency of patients who would formerly have been certified to seek admission of their own accord. The cases received have been mostly in the middle period of life—from 30 to 60 years of age—and two-thirds of the recoveries have also taken place during that period. The total duration of the mental illness in two-fifths of the recovered cases was less than six months, and in another two-fifths it was between six months and two years.

This *Chronicle* is the product not only of great industry but of affection such as not every institution can command. It includes much small detail—the prowess of the Crichton team in the cricket field, for example, and the renovation of the asylum piggeries—and no pains have been taken to avoid repetition; but it is possible to gather from it a picture of the development of the treatment of mental disorder in Scotland during the last hundred years with a fullness which could not have been obtained in any other way. We are able to trace, from the point of view of one institution, the emergence of new ideas and their fructification and practical results. The well-produced illustrations add to the value of the book.

ST. THOMAS'S REPORTS

St. Thomas's Hospital Reports. Second series. Volume IV. Editors: Prof. O. L. V. S. De Wesselow, Mr. C. Max Page, assisted by Mr. N. R. Barrett, Dr. J. St. C. Elkington, and Dr. A. J. Wrigley. (Pp. 198.) London: St. Thomas's Hospital.

This latest volume in the second series of reports from St. Thomas's Hospital, like its predecessors, reflects recent work in various branches of medicine. Mr. J. S. Richardson first reviews the researches of the last ten or twelve years which have determined the chemical constitution of the male sex hormone. It has now been found that testosterone, the secretion of the interstitial cells of the testes under the influence of the anterior pituitary gonadotrophic hormone, influences some cases of prostatic hypertrophy and benefits some disorders of the breast. Careful selection of cases is, however, necessary. One of the most interesting phenomena in the study of the circulation is the change over from the foetal to extra-uterine life. Prof. Barnard describes the changes leading to the closure of the ductus arteriosus, and Dr. Nosworthy discusses the normal stimulation of breathing, the factors responsible for asphyxia neonatorum, and the principles of active treatment. Few institutions possess the necessary resources to operate an oxygen tent, but Dr. Forest Smith and Prof. McSwiney show that there are many methods of administering with ease and certainty fairly high concentrations of oxygen, which are of proved value in the treatment of shock, abdominal distension, and acute cardiac failure. Mr. Belsey discusses the pathology and treatment of empyema thoracis, and Dr. Griffiths the conditions of insulin resistance in thyrotoxicosis, relating this to altered metabolism of the liver; there appears to be a correlation between insulin resistance and defective synthesis of hippuric acid. Dr. Elkington's contribution on the pathology, clinical picture, and treatment of cerebral abscess is timely; the experiences gained by careful observation and considered judgment in civilian work will be valuable when applied to war injuries. Mr. Neilson points out that orbital inflammation is usually a sequence of nasal infection spreading to the ethmoidal cells and through the periosteum to the orbit; open operation is the method of choice. The administration of food and drink early with massive transfusion by continuous drip have not materially lessened the mortality from gastro-duodenal haemorrhage at St. Thomas's, and Dr. J. B. Harman urges surgical measures. He recognizes, however, the difficulties of diagnosing bleeding ulcer from a state of gastrostaxis, and the technical problems of anaesthesia and operative procedure. These cases are among the most difficult that are encountered in hospital; the degree of exhaustion of the patient when admitted may be so great as to preclude success. More hope for them is to be found in the early diagnosis, efficient treatment, and subsequent supervision of cases of chronic ulcer, which is the precursor of the pernicious type of recurrent haemorrhage. The element thorium is the parent of a series of radio-active products, among them thorium-X, a disintegration product having a half-decay period of

about three and a half days. Thorium-X is a source only of pure alpha-radiation and is manufactured in England. It is used in alcoholic solution, which can be standardized. Dr. Prosser Thomas, who has had personal experience of its use over a period of two years, discusses its application in the treatment of certain skin diseases. Its main value appears to be in superficial skin affections, and encouraging results in the treatment of naevus are reported. Finally, Dr. Vass contributes a useful summary of estimations by chemical and biological assay of the water-soluble vitamins in body fluids.

THE CHILD'S DISCOVERY OF DEATH

The Child's Discovery of Death: A Study in Child Psychology. By Sylvia Anthony, M.A. With an introduction by Prof. J. C. Flügel. (Pp. 231. 11s. 6d. net.) London: Kegan Paul, Trench, Trubner and Co., Ltd.

Mrs. Anthony, an experienced educational psychologist, has set out to elucidate the young child's reaction to death. This is an important line of inquiry because, owing to their own subsequently developed fears and inhibitions, adults indulge in a great deal of muddled thinking on the subject, and so handle children unwisely and in such a way as to implant and perpetuate their own mistaken attitudes. Mrs. Anthony has been brought up along psycho-analytic lines under the influence of Prof. Flügel, who writes a foreword for her and draws the customary parallels between children's fantasies, folk-lore, and traditional legend. To the prejudiced this approach may be repellent, but the more the whole subject is studied from an unbiased standpoint the more it must be realized that the main trouble is the difficulty in expressing in words the reactions of the infancy of both the race and the individual. The reason is that these reactions are *much more of the nature of feelings than of ideas, and if "words are given us to hide our feelings"* they certainly fail, except in the hands of a few poets, to convey to others an exact description of the non-verbalized attitudes to the fundamentals of experience, and this more particularly in the case of children. Three methods of approach are used: first, "home records" of five families of children taken by the parents; eleven children were so studied. The second—the story-completion test—and the third—special modifications of a well-known intelligence test—were applied in the course of the author's routine work. Case records and examples are given, and the conclusions reached are that:

1. There is little justification for the common parental practice of hiding death from children or of laying a special ban on "gruesome" folk-lore or fairy-tales, since death occurs readily in the fantasies of children, though of course some children develop special anxieties relating to death which require careful handling.

2. There is a tendency for the child to feel a sense of guilt whenever a member of the family dies. This may result in irrational aggressiveness or despondency. To overcome this the child should be allowed to work out his feeling towards the dead person without sentimentality and without shocked astonishment if he expresses hostility to the person who has died.

Many phobias and compulsions arise out of conflicts centred around the fear of death and a desire to rejoin the loved person in death—all very vague and unverbalized, of course, but still felt.

3. It is perfectly legitimate and healthy for a child later to reject fantasies and thoughts of death, but only after he has assimilated this idea or better feeling in respect of it into his consciousness, and this assimilation is necessary whether there has been an actual experience of death in the family or not.

Notes on Books

A second edition has now appeared of the Penguin special *Science in War*, which was the subject of a leading article in our issue of August 3, 1940 (p. 158). A new section under the heading of "Pills and Mixtures" reinforces what was said in an annotation in the *Journal* of December 21 (p. 875) on Rationalization of the British Drug Industry. "The unprogressive character," the writer in *Science in War* states, "of the network that can be called the British Pharmaceutical Industry stands out not only in the lack of major research developments, but also in the internecine competition with which different firms market the same substances bought in a manufactured or semi-manufactured form from a single source. To the utter confusion of the public, and often of doctors too, one drug may be sold by a dozen different firms, under a dozen different names." The writer goes on to point out that the pharmaceutical manufacturing potential in this country is much less than that of a small country like Switzerland, and refers to the high state of organization of the industry in Germany. He believes that the tide of events is pushing the medical services of the country into an organized National Medical Service; with this there must develop a rationalized pharmaceutical service. The British pharmaceutical industry owes a responsibility to itself and to the country to make its contribution to research and marketing in a way that is worthy of the Mother Country of the British Commonwealth of Nations.

We welcome the appearance of the twelfth edition of *Cushny's Pharmacology and Therapeutics*, which since 1926 has been edited by Profs. C. W. EDMUNDS and J. A. GUNN. The three years that have elapsed since the last edition have seen a very rapid advance in many important branches of pharmacology. These changes have called for an extensive revision of the text, but this work has been carried out very thoroughly. Sections dealing with the sulphonamide drugs, barbiturates, vitamins, and certain endocrines have been very largely rewritten. Ever since it first appeared in 1899 this textbook has been recognized as a leading authority on the mode of action of drugs, and the present edition maintains its past reputation. The publishers are J. and A. Churchill and the price is 30s.

Preparations and Appliances

CRYSTOFLAVINE BURN LOTION

Recent discussion on the treatment of burns has brought to prominence the value of the "triple-dye" treatment originated by Aldrich in 1933.[1] One of the drawbacks to tannic acid is its lack of antiseptic power, which is provided by the dyes in the triple-dye mixture, the dyes used being active against both Gram-positive and Gram-negative organisms. Messrs. Crookes Laboratories point out that in addition to their tannic acid jelly (which itself contains the triple-dye mixture incorporated with the tannic acid), they have had available for some time a triple-dye lotion, under the name of crystoflavine burn lotion, designed for the treatment of burns in cases where circumstances or personal preference make it undesirable to use tannic acid. This triple-dye mixture, consisting of brilliant green, gentian violet, and acriflavine, was used with satisfactory experimental results confirmed by clinical experience. Thus Devine[2] treated twenty-seven cases with this mixture, and confirmed its superiority in resisting infection of the burnt area, and also found the mixture to possess a distinct analgesic action. Crystoflavine burn lotion is dabbed or painted on the burn and allowed to dry. A second treatment is given after half an hour. Blisters should be snipped and dead skin removed. No dressing is applied.

REFERENCES
[1] *New Engl. J. Med.*, 1933, 208, 299.
[2] *Med. J. Austral.*, 1939, 1, 14 and 924.

MICHAEL J. SMYTH: EXPLORATION OF THE COMMON BILE DUCT FOR STONE



FIG. 1.—Filling defect A-B, lower end of common bile duct. Obstruction incomplete, as opaque medium (per-abrodil) is in duodenum.



FIG. 2.—Per-abrodil in duodenum and common bile duct after removal of five stones and dilatation of sphincter of Oddi. T-tube in common bile duct also shown



FIG. 3.—Ducts filled with uroselectan after removal of stones from common bile duct.

L. R. BROSTER: FEMINISM

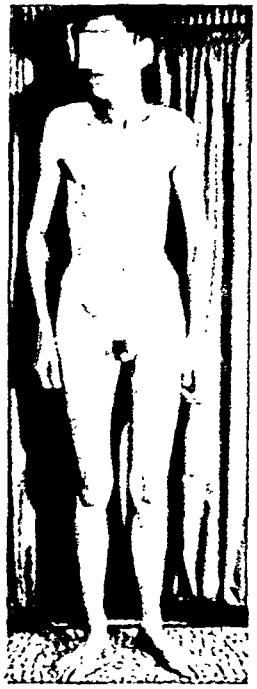


FIG. 1.—Before operation.

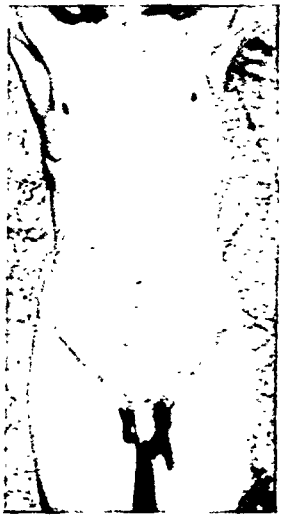


FIG. 2.—Eight months after operation.



FIG. 1.—Case 1. Before operation. Cavity right apex.

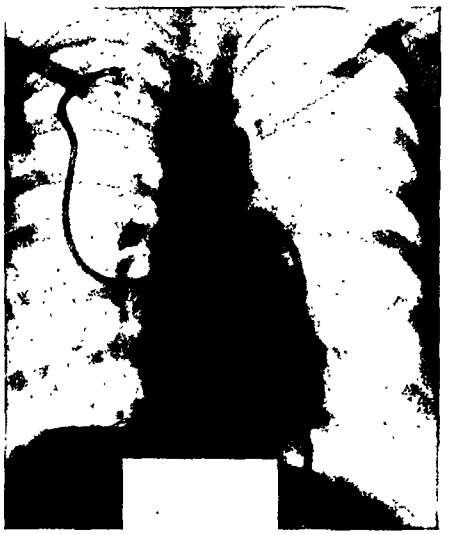


FIG. 2.—Case 1. Showing result of drainage.



FIG. 3.—Case 2. Before operation. Cavity left upper lobe.



FIG. 4.—Case 2. Showing result of drainage.



FIG. 5.—Case 3. Cavity left apex eight days after drainage.



FIG. 6.—Case 3. Cavity thirteen weeks after drainage.

out to them, and the laboratory class-rooms were on the second and third floors of the Institute. One of the infected students who had not taken a course had visited the classrooms on three occasions during the term, but had neither drunk water nor washed his hands. The animal-room attendant worked on the second floor; the plumber had installed an autoclave on the first floor, and had worked in the basement while connecting up the autoclave. The typist worked in an office on the first floor of the building, but paid a daily visit to the *Brucella* laboratory. The salesman called at the typist's office on December 13 just long enough to leave advertising matter, and a second time for a few minutes early in January. Altogether 349 students had taken out courses during the autumn term; an examination of 316 of them showed that in addition to the active cases already mentioned forty-four others had subclinical infections. Since milk could be excluded the possibilities suggested were contamination of the sewage system, of the water supply, or direct contact. No evidence that the sewage system was contaminated could be obtained, and only by exercising very considerable engineering ingenuity was it possible to produce siphonage of water coloured with fluorescein through the cold-water tap at the basement wash-room sink and into the main water line. To obtain back-siphonage it was necessary to shut off the water from the town main, and this had never been done. In addition, the laboratory animals—guinea-pigs and rabbits—which were given water daily from the laboratory supply, were entirely free from *Brucella* infections. The other possibility was direct contact with carriers, and in favour of this was the fact that the majority of both the clinical and subclinical cases were in three laboratory classes; but when subjected to a critical analysis the figures were insufficient to prove any such hypothesis. One possibility on which, however, no evidence is forthcoming is that the ventilating system in the Institute became contaminated and that *Brucella* passed through the various rooms as a result of forced draught. It is known that *Br. melitensis* can live for as long as six weeks in dust. *Brucella* infections in individual laboratory workers have, of course, been known for years, the source of the contamination being usually put down to splashes of infected material getting on to the laboratory bench. No such herd infection of human beings such as has occurred in Michigan has previously been recorded.

RENAL FUNCTION IN ACUTE DIFFUSE NEPHRITIS

Although the pathology of acute diffuse glomerulonephritis has been studied for many years, there is still some doubt about the earliest changes in the glomerular capillaries and the effect these changes have on the glomerular circulation and on filtration through the capsule. Shaw Dunn[1] has recently studied the histology of fifty-eight cases of acute diffuse nephritis collected over many years in which death occurred in an early stage. He concluded that the first recognizable change is a uniform patency of the capillaries in all the glomeruli. The diffuseness of the lesion is striking, every capillary in every tuft being affected. The tufts are enlarged, and this increase in size is soon accentuated by the remarkable increase in cellularity of the tufts which all pathologists describe in the acute stage. The intertubular capillaries and the tubules are little altered. Shaw Dunn argues that this uniform patency and dilatation of the glomerular capillaries can account for many of the clinical features of the disease. As is well known, in the normal kidney the glomeruli work in shifts, only a small number being in action at one time. In acute nephritis the circulation in each glomerulus is slowed and filtration is correspondingly less, but as all the glomeruli are now in action together the total filtrate may be as great as under normal conditions, so that non-threshold substances will be adequately removed and the blood urea or non-protein nitrogen may remain normal; but there will be increased opportunities for reabsorption, and the urine excreted will be scanty in quantity, the reabsorbed salt and water causing hydraemia, a rise in blood pressure, and increased transudation of fluid into the tissues. Thus the oliguria, oedema, and possibly the hypertension of acute nephritis can all be explained by the renal lesion, and Shaw Dunn shows how theories attempting to explain the oedema by extrarenal factors are all unsatisfactory. A small leakage of protein from the dilated capillaries will be concentrated in the tubules and explain the often abundant albuminuria. The same author[2] demonstrated a similar uniform patency of glomerular capillaries in subacute nephritis of the nephrotic type, and explained the oedema of that stage on the basis of excessive reabsorption from the tubules, though it is accentuated by the lowered plasma protein content which occurs in these more chronic cases. Platt[3] independently arrived at the same conclusion—that is, that renal oedema in the acute and subacute stages could be explained by the combination of slow filtration and the use of more glomeruli than normal, leading to increased reabsorption and therefore retention of salt and water by the kidney. His arguments were based on the work of Verney and Winton on glomerular pressure. Thus it seems that there is a gradual return to the older and simpler view that in nephritis the renal lesion is sufficient to account for the clinical symptoms without postulating unlikely conditions, such as generalized increase of permeability of capillaries, which have never been shown to exist.

[1] *J. Path. Bact.*, 1940, **51**, 169.

CHANGES IN CALIBRE OF RETINAL VESSELS

Localized constrictions in the retinal arteries are readily observed ophthalmoscopically in cases of severe arterial hypertension. How often these constrictions should be attributed to organic deformity of the vessel wall and how often to vascular spasm is a problem which still presents difficulties. In some cases the arterial wall at the point of constriction appears opaque and thickened, but usually the vessel wall is not visible with the ophthalmoscope. The disappearance of a localized constriction is regarded as evidence that it was spastic in origin, and transitory constrictions are common in essential hypertension and especially in the hypertensive toxaemias of pregnancy. As spasm can be persistent, a continued narrowing of an artery, or part of it, is not conclusive evidence that the narrowing is organic in character. To the limited and confusing pathological observations bearing on this problem Laughlin, Thomas, and Friedenwald[4] have made a useful contribution by a correlated ophthalmoscopic and pathological study on a dog suffering from vascular hypertension induced by the Goldblatt technique (partial occlusion of the renal arteries). The animal showed definite renal hypertension and advanced changes in the retinal arteries. After careful ophthalmoscopic studies with photographs and drawings of the retina had been made, one of the eyes was enucleated and cut into serial sections, and on an extensive analysis of this material the authors conclude that ophthalmoscopically visible arterial constrictions may occur without organic changes in the vessel wall, and that the converse is also true. While the relation between

[2] *J. Path. Bact.*, 1935, **33**, 1.
[3] *British Medical Journal*, 1936, **1**, 887.
[4] *Johns Hopk. Hosp. Bull.*, 1940, **67**, 79.

experimental renal hypertension in dogs and essential hypertension in man has to be elucidated, this study emphasizes the impossibility of determining the character of a given arterial constriction in the retina by ophthalmoscopic inspection alone. Bearing on the question of variations in arterial lumen are the observations by Cusick, Benson, and Boothby[2] on the effect of anoxia and of high concentrations of oxygen on retinal vessels. Previous workers have noted that colour changes in the retina and even variations in the size of the normally present angioscotomata occur with changes in oxygen concentration. The present authors report that in anoxia at simulated altitudes of 18,000 to 21,000 feet there is a dilatation of the vessels varying between 10% and 20%, while with high concentrations of oxygen there is a narrowing in calibre ranging from 10.5% to 37.7%. As a rule the veins show greater changes than the arteries. The authors hold that the changes in the size of angioscotomata observed under these conditions are largely, if not exclusively, due to the alterations in the calibre of the vessels themselves. In view of the intimate relation of the retinal circulation to that of the brain, these observations have an obvious bearing on the physiological problems of flight at high altitudes.

MEASURING VENTILATION

In 1936 an advisory committee of the Royal College of Physicians commented on the paucity of information available on the ventilation of small rooms. In order to remedy the deficiency, Mr. C. G. Warner, Ph.D., measured[3] the rate of ventilation on 312 occasions in thirty-one rooms in a block of older flats, a block of modern flats, three villas, and a modern university building (presumably the London School of Tropical Medicine). His procedure was to liberate a quantity of coal-gas and measure the rate of its disappearance with a katharometer—a device which makes use of the difference in the electrical resistance of identical heated coils exposed to pure air and the room atmosphere respectively. Outside wind-speed is an important factor in ventilation, even in a closed room, and in this experiment a higher wind meant better ventilation even when air gratings were closed. Even when a room is quite closed there is considerable infiltration through the cracks round doors and windows. In the modern flats the windows fitted well but the leakage round the doors varied widely; when gratings or flues were open this variation made a noticeable difference to the rate of air change. A small amount of window opening greatly increased the natural ventilation. Distempered brick walls, however thick, let much air through, but wallpaper stops an appreciable amount of this, paint more, and hard gypsum plaster —as used in the modern university building—practically all of it. Rooms in old flats admitted more air than did those in new flats when ventilators were closed, and rooms in new flats more than did rooms in the university building with their hard plaster. The rooms in private houses had qualities comparable with those of the rooms in old flats. Temperature difference between inside and outside did not seem to affect the ventilation, but it was not great. The minimum healthy air supply per person is about 600 cu. ft. per hour. The single bedrooms in the modern flats barely admitted this with the ventilators open; the double bedrooms in the older flats only admitted two-thirds of it with the ventilators closed. Fireplaces proved efficient ventilators, but gas-fire flues did not. When flues were closed in all types of buildings ventilation was much below the admissible minimum. The use of flueless gas heaters in small flueless rooms with ventilators closed should, in Mr. Warner's opinion, be reconsidered.

[2] *Proc. Mayo Clin.*, 1940, 15, 500.
[3] *J. Hyg., Camb.*, 1940, 40, 126.

COMPULSORY EVACUATION OF CHILDREN

The Minister of Health has made an Order providing for the compulsory evacuation from the Greater London evacuation areas of children who are found on medical examination to be "suffering in mind or body as a result of hostile attacks or are in such a state of health as to be likely so to suffer if they remain in the area." Local authorities may order a medical examination, which will be carried out by doctors appointed by them, of any child under 14 years who is thought to be suffering in this way, and may direct that the child shall be evacuated within a specified period, which will be not less than seven days. Parents or guardians will be served with a notice of the medical examination, and may, within seven days of the evacuation order, appeal against it to a Court of Summary Jurisdiction. If the child remains in, or returns to, the area the parent or guardian and any person bringing the child back or harbouring it will be guilty of an offence under the Defence Regulations. It will be a defence to such a charge, however, if the parent or guardian can prove that a child was in London without their knowledge or consent. A Regulation has also recently been issued providing for the medical examination of children found in shelters. The Ministry of Health circular announcing these powers states: "While the purpose is to ensure the evacuation of children who are suffering by being kept in London, it is not expected that local authorities will have to go to the length of issuing directions for removal except in a minority of cases." It is hoped that where evacuation is necessary parents or guardians may be persuaded to agree to it.

WAR STRAIN IN EVACUATED CHILDREN

The Ministry of Health is to be congratulated on its foresight in having established in one reception area at least, the county of Huntingdon, a child guidance officer to counter the serious mental strain imposed on children by separation from their home surroundings. It is to be hoped that this experimental service may be expanded and extended to other districts. It is clear from what was said at a recent meeting of the Tavistock Clinic (reported on p. 124) that war strain in children is a matter calling for urgent consideration and that the main source of the condition lies not in the bombed cities but in the reception areas. Wartime circumstances impose on children an abnormal strain—the break-up of normal family life, loss of environmental security, irregularity of education, divided loyalties, and, above all, the fear of impending disaster to their families or to themselves. All these factors contribute to bring about a tension that is at times not far short of breaking point. Mr. Malcolm MacDonald, the Minister of Health, is reported to have said at Bristol early this week that "one of the most remarkable things about the war" is that bombing has not affected the nerves of adults and children to anything like the extent that was feared. It is also remarkable that children who are evacuated appear to be undergoing a greater mental stress than those who remain in bombed areas. This becomes evident in such reactions as enuresis, anxiety, depression, and disorders of behaviour. Many factors probably enter into the causation of increased mental strain among these evacuated children, but the chief one appears to be the break-up of home life and all that that means. Much must obviously depend on the attitude of the foster-parents, and the sympathy and love they are prepared to extend to these additions to their families. The foster-parent, unless she is an exceptional person, will find it difficult to give help to just those children

most in need of it, while the child who has adapted itself to the changed circumstances will more readily become one of a new family. There is in this situation a very real danger that the seeds of neurosis will be sown in an increasing number of children, and apart from the immediate distress and disability arising from this, there is the wider question of what these children will go through later as adolescents and adults. It will be lamentable if the adults of the future will have cause to regret the mental disharmony thrust upon them in a laudable attempt to save their bodies. Evacuation of children from bombed cities is a policy which has the whole-hearted consent of everyone, but there is a danger that the authorities, satisfied with the achievement of one aim—the physical safety of the children—may fail to see the importance of preventing the mental risks that they run. There are a number of child guidance workers in the country at present engaged on a variety of tasks because opportunities for doing the work for which they are trained are not available. There are also many women psychiatrists who could be mobilized to deal with children showing signs of nervous strain in reception areas. Perhaps the most satisfactory solution would be the formation of mobile psychiatric units in counties or regions to which the evacuated children have been sent. It is to be hoped that the Ministry of Health will give a lead to local authorities to undertake one more duty in addition to the many others that have been thrust upon them by the abnormal conditions in which we live.

SYMPATHICOMIMETIC DRUGS IN THE TREATMENT OF PSYCHOSES

There has been much talk about disturbance in the vegetative nervous system in psychiatric patients, but very little of the evidence is exact or well established. Some see in vegetative disturbances merely an effect of the emotional state characteristic of the psychosis in question; others see a manifestation parallel with the mental symptoms of a common underlying disorder of the central nervous system; while others see a clue to the cause of the psychosis. The matter is totally undetermined, and it may be that all three relationships are involved. Much biochemical as well as systematic clinical work remains to be done in this field. Meanwhile sympathicomimetic drugs have to be used empirically, and it is all the more important to have controls. It is a pity that Sir William Gull's classical clinical experiment—the treatment of rheumatic fever with peppermint water—is not more widely remembered. Tietz,[1] in a paper on the action of ergotamine tartrate on aggressively disturbed psychotic patients, records favourable results obtained in a previously tested large series of 150 cases, and examines some of the physical changes accompanying the clinical improvement. He concludes that the alterations in blood pressure and pulse rate, blood sugar, blood calcium and phosphorus are so slight as to exclude the possibility that the ergotamine is effective because of its peripheral action. The clinical results, therefore, if they mean anything, indicate a central effect, and it is stimulating, although wildly speculative, to bring them into line with Bard's work on a "centre" for behaviour patterns of rage in animals with the thalamus cut at a certain level. Does the ergotamine act by picking out a mechanism released or dissociated at the thalamic level, and subduing it? The level of neurological release may have a biochemical counterpart, and this, too, needs elaboration, and points to a set of problems of neurological, biochemical, and ultimately, at a higher level, of psychiatric relationships that has hardly yet been touched. Such studies as Tietz's are suggestive rather than satisfying; but there is nothing like trying, and many of the best-known remedies in medicine, even those recently discovered, have been hit upon by "mere empiricism." The drug should, of course, be given by a route known to be effective by its action in other respects, and in varying dosage; it is also necessary to have controls. It is surprising that this method of pharmacological clinical experiment has not been more used as a means of investigation into the aetiology of the conditions to which the drugs are applied. In the meantime, there are already interesting antinomies to be resolved. Assuming that ergotamine really does quieten aggression, why does adrenaline with a supposedly opposite action control the excitement of catatonia, as some believe? It is possible, of course, in scientific zeal to forget that the first duty of a physician is to relieve suffering. Why, in this series, was the ergotamine discontinued when it had been symptomatically so successful?

[1] *Psychiat. Quart.*, 1940, **14**, 431.

A POLISH MEDICAL SCHOOL IN EDINBURGH

The University of Edinburgh has offered to the Polish Government facilities, which have been cordially accepted, for the establishment in Edinburgh of a Polish School of Medicine. It will be staffed by professors and teachers now serving with the Polish Army in this country, and by professors of the Edinburgh faculty of medicine in such basic subjects as may not be represented among the Polish professors. Discussions are in progress between representatives of the Polish Government and of the University of Edinburgh to settle details of the scheme. The University has gladly undertaken to provide accommodation and material to the utmost of its power, and the city authorities have informally indicated that they will co-operate in the provision of opportunities for clinical instruction. By establishing the nucleus of a Polish faculty of medicine in Edinburgh one of the most important branches of Polish learning—medical research and teaching—will be kept alive, and as little time as possible will be lost after the war in reorganizing active medical services and medical education in Poland.

THE HALF-YEARLY INDEXES

The usual half-yearly indexes to the *Journal* and to the *Supplement* are now ready. They will, however, not be issued with all copies of the *Journal*, but only to those readers who ask for them. Any member or subscriber who wishes to have one or both of the indexes can obtain what he wants, post free, by sending a postcard notifying his desire to the Accountant, British Medical Association House, Tavistock Square, W.C.1. Those wishing to receive the indexes regularly as published should intimate this.

We announce with much regret the death at Grayshott, Hindhead, in his ninetieth year, of Emeritus Professor Frank T. Paul, consulting surgeon to the Liverpool Royal Infirmary and formerly dean of the medical faculty of the university.

Sir Henry Head, M.D., F.R.S., who left estate valued at £144,588, bequeathed the greater part of this to the Royal Society, for the advancement in England of the science of medicine.

Reports of Societies

ACTIVE IMMUNIZATION: SOME PRESENT-DAY PROBLEMS

At a meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine on January 14 a discussion took place on some present-day problems in active immunization. Sir WILLIAM WILLCOX, who presided, said that in view of the possible pollution of water supplies due to burst mains, the blasting of dust into the bodies of those injured in air raids, and the congregation of large numbers of people in shelters, the civilian population was running considerable disease risks, and the importance of immunization was rendered all the greater.

Dr. H. J. PARISH said that it was necessary to consider which diseases could be dealt with effectively by preventive inoculation, and whether, in the case of diphtheria at least, some compulsory measure might not be necessary and urgent. Now was the time to institute a campaign, *without waiting for a major epidemic*; anticipation of the event was the keynote of good preventive medicine.

Diphtheria

Immunization against diphtheria was safe and effective when properly carried out, but unfortunately the bulk of the child population had not been reached. In 1939 Sir John Ledingham advocated compulsory measures, and the need was greater to-day, especially for the younger age groups. Could procedure be simplified to facilitate mass immunization? In the present emergency the Schick test might be reserved for selected groups and to control modified methods. Proper spacing of doses of prophylactics and periodic reinoculation would ensure a high level of immunity. It had always been his policy to advocate two doses of alum-precipitated toxoid—A.P.T.—separated by one month's interval, for children. Recently he had advised the medical officer of a large industrial concern with many young employees to use two widely spaced doses of T.A.F., a milder antigen which was usually given in three doses separated by periods of a fortnight; the medical officer was anxious to reduce the number of injections and reactions. *Representative groups might be Schick-tested* to control the modified method, but, if this was impracticable, criticism was answered when it was remembered that the important consideration was to give some protection to as many persons as possible. But in the desire to reduce the number of injections it was important to beware of so-called one-shot methods. To induce a high titre more than one stimulus was necessary, and the length of interval was more important than the size of dose. It had been shown with guinea-pigs that two doses of 0.1 c.cm. of A.P.T. given at an interval of four weeks produced much higher results than a single dose of 1.0 c.cm. Nasal immunization (for periodic restimulation) had made little headway in this country because it sometimes caused inconvenience from reactions; but it had possibilities, and purified toxoids might again be tried by this route. Indiscriminate swabbing was to be discouraged; high carrier rates were an indication for widespread diphtheria prophylaxis.

Enteric Fever and Tetanus

Damage to water mains and sewers and the improvisation of sanitary arrangements in shelters made the risk of serious epidemics of enteric fever very real. Mass immunization was desirable in many areas, although there was no justification for compulsion except for certain wholesale-food operatives and people who might be exposed to special risks. The Army doses of 0.5 and 1 c.cm. vaccine at an interval of seven to ten days were worked out for young men in good physical condition, and more attention might be paid in civilian practice to physical state and body weight. It was a good plan to give the inoculations late in the afternoon and, if possible, at the week-end. The conventional dose might be further reduced if an effective response could be demonstrated by available tests. After the primary course very small periodic doses (for example, 0.1 c.cm.) were worthy of trial. Vaccine could be given during an epidemic without increasing the chances of infection, as was mentioned by Colonel H. J. Bensted in his recent Harben Lectures.

A year ago much more importance would have been attached to tetanus prophylaxis, but the incidence of tetanus in this war has been negligible. Members of the Land Army, A.R.P. workers, and others might be immunized with toxoid, but mass immunization of the population was not advised. Anti-tetanic serum should be given early to all wounded persons. Two doses of toxoid spaced by six weeks were quite useful, giving good immunity; wider spacing gave better results, but was usually inconvenient administratively. Women gave significantly higher titres than men, and boys up to the age of 4 were twice as susceptible to tetanus as girls, suggesting that females had a greater inborn resistance to this infection (see Marvell and Parish, *British Medical Journal*, December 28, 1940, p. 891). A third dose of 1 c.cm. after a long interval—seven to nine months—often produced a dramatic rise in circulating antitoxin, and counteracted any tendency to waning immunity.

Other Infections

Dr. PARISH considered that this country might have to pay dearly for its failure to make vaccination against small-pox compulsory, and infection by virulent strains from the Continent might tax the resources of the public health services. Whooping-cough prophylaxis might be indicated for the individual; any measure which would reduce the ravages of this infection, even slightly, should not be ignored. The large number of injections usually recommended was a deterrent to mass immunization. Research into the possibility of fewer doses and wider spacing was indicated. For measles, methods of active immunization were not sufficiently advanced to be worthy of serious consideration in the present emergency. Scarlet fever was fairly mild, although active immunization of staffs of hospitals was important. The success of chemotherapy in cerebrospinal meningitis had removed the necessity for consideration of meningococcal vaccine. In dysentery (Shiga) presumably formol toxoid could be made available for human immunization, and research to this end was now in progress. Results obtained with coryza and mixed influenza bacterial vaccines were not very convincing, and experiments were now being made with influenza virus vaccines.

Combined immunization with diphtheria and tetanus toxoids and T.A.B. vaccine had been in vogue for some years in the French Army, but, taking reactions into account, one would hesitate to ask the British Army to submit to it. Diphtheria prophylactics sometimes caused reactions in older subjects, tetanus toxoid rarely, and T.A.B. frequently. It might be useful to combine T.A.F. and tetanus toxoid, also tetanus toxoid and T.A.B. vaccine. T.A.F. plus T.A.B. was probably contraindicated for adults on account of severe reactions. Diphtheria A.P.T. should not be mixed with tetanus toxoid as it might go into solution and become ineffective.

In conclusion, something should be said in warning to those who neglected the usual precautions of sterilization of syringes and needles and maintained they never had a case of sepsis. Many sore arms ascribed to the prophylactic were really due to bacterial infection. Published and private reports demonstrated the grave risk incurred if the instruments were not sterilized by heat. Far too many practitioners relied on alcohol as a disinfectant, although its unreliability was well known. One set of syringes and needles should be reserved solely for inoculations, and another complete set for the withdrawal of pathological fluids. A fresh sterile needle should be used for each injection. An intensive campaign was no excuse for slip-shod methods.

Combined Immunization

Dr. J. H. MACLEAN said that the diseases which he regarded as of primary importance from the point of view of active immunization were enteric fever, diphtheria, whooping-cough, influenza, and tetanus. None of these was a disease against which there was active chemotherapy, but there were efficient prophylactic agents for all of them. In considering combined immunization against various infections, it must be borne in mind that this measure was for the convenience of the practitioner and the patient, and the mixtures should be constructed to suit the particular group of population which it was intended

to immunize. If large-scale immunization of the general population was to be carried out, then for reasons of urgency or for convenience it must be determined what combinations of antigens were effective, so that the number of injections was reduced to a minimum—for example, how far was it possible to combine (*a*) various bacterial vaccines, (*b*) bacterial vaccines and toxoids, and (*c*) bacterial vaccines and virus vaccines so as to obtain the best response to each antigen? The best spacing of doses had also to be considered, as well as the great variation in individual response. Was this combination of antigens sound immunology, and how far should it be extended? It had been found that healthy people did respond to mixtures. Inoculations of vaccine containing thirty different types of pneumococci had been given, and although thirty types were not tested, those which were showed an adequate response. Ramon had been successful in human immunization with combined diphtheria and tetanus toxoids. Extension of this mixing of toxoids may throw too much strain on the immunity mechanism; work was proceeding on this matter, and information would soon be forthcoming. In combining a bacterial vaccine with a toxoid, not only did the mixture not impair the response to each type of antigen but there was definite proof that in some cases the combination would enhance the response to the toxoid. T.A.B. plus tetanus toxoid was suitable for an adult civil or military population. Maclean and Holt had shown that the response to tetanus toxoid in man was five times better if combined with T.A.B. vaccine than when the toxoid was used alone, and Culver Evans and Maclean had obtained full responses in children immunized with a combination of whooping-cough vaccine and diphtheria A.P.T. Very little had been done on the combination of a bacterial vaccine and a virus vaccine, but if an emergency arose and a decision had to be made to immunize against an epidemic of influenza he thought it would be reasonable to combine a vaccine of the influenza virus with a vaccine made from the catarrhal organisms which might be definitely associated with the epidemic.

Active immunization in the presence of an epidemic had been claimed by those who had had to deal with large epidemics abroad to have cut short the epidemic. The negative phase was a definite bogy, but an adjustment of the usual prophylactic dose might be required, the practice generally being to give half the dose, which worked very well. Slowly spreading epidemics might thus be successfully combated. The significance of the individual responses did not seem to be appreciated. In a recent experiment 10 % of persons were found to be poor reactors, but there was not sufficient experience to convert the individual response into terms of susceptibility to infection. It was a very important public health question whether poor responders should be given a special course of immunization. It was known that they were greatly benefited by increasing intervals between doses and by being given a mixture of toxoid and vaccine, and in children it might happen that they should be given another course in which the toxoid would be incorporated with an irritating vaccine such as T.A.B. or whooping-cough vaccine.

Questions and Discussion

Dr. R. A. O'BRIEN mentioned the real problem of the bad responder, saying that if he did not respond to one vaccine he would probably fail to do so to another. He had found failure to respond to diphtheria prophylactics in children who were members of the same family; some hereditary factor might be concerned. It was interesting that Dr. Maclean regarded the negative phase in active immunization as a definite bogy which could be disregarded. Dr. BROWN spoke of the part played by the polymorphonuclear cells in combating tissue infections. Prof. A. FLEMING remarked that it was easier for a bacteriologist to show how to protect against disease than for the public to be convinced that they should be protected. To the general public a needle prick was a serious business, and the inoculated person attributed to the injection all his other troubles for the next month. On the question of sterilization of syringes Dr. Parish had not mentioned the boiling-oil method, which was most convenient economically and practically. It had been used at St. Mary's for thirty years. Dr. C. H. ANDREWES, in speaking of immunization against influenza, regarding it as a mixed infection of virus and bacteria, suggested that it was a mistake to mix two vaccines both unknown, because this would delay the acquisition of knowledge as to whether either or both were any good. Dr. H. SCHITZE said that the civil population, unlike the Army, was not immunized against enteric fever. He thought that civil defence workers and those who dealt with damaged water mains should be protected. Dr W. M. CROFTON spoke on the need for great care in the sterilization of syringes and needles. Major A. E. FRANCIS said that prophylactic doses in an epidemic, if supplies were limited, might be quite small. It was better to give the maximum number of people some protection than to give a few individuals normal doses. Surgeon Commander RAINSFORD asked as to the keeping qualities of a mixture of T.A.B. and toxoid. Dr. NORAH SCHUSTER said that it was her practice to give massive doses of calcium lactate before injecting T.A.B.

Dr. PARISH, in reply, said that some experiments had been carried out with nasal immunization against diphtheria in which purified toxoid had been incorporated with an ointment base; some adults suffered no inconvenience and responded well, but others preferred any number of injections to a nasal administration, and showed no increase in circulating antitoxin. He thought further research was indicated. He had experimented with the boiling-oil method of sterilization of syringes intentionally infected with sporing cultures, and had found there was growth in practically every instance after its use. The use of separate syringes and needles for inoculations and for the withdrawal of pathological fluids was recommended, in which case boiling the former immediately before injections were made would be quite satisfactory. Autoclaving was the ideal method, but was not always practicable. Dr. MACLEAN, also speaking in reply, said that in respiratory infections something could be done by the use of a bacterial vaccine. In the presence of an epidemic the use of smaller doses if necessary was certainly to be recommended. With regard to the keeping qualities of T.A.B. and tetanus toxoid, he had been using these mixtures out of the same bottles for some months, and they were still quite satisfactory. So far as calcium lactate was concerned, he had discontinued its use when the issue of rejuvenated typhoid vaccine was made: it was preferable to inject a small preliminary dose of vaccine to lessen the local and general reaction.

Correspondence

Medical Planning Commission

SIR,—In view of the increasing and undisputed importance of psychotherapy in medicine, may I suggest that the Institute of Psycho-Analysis and the Tavistock Clinic be invited to send delegates to the B.M.A. Medical Planning Commission?

Since the planning of medicine is only one facet of the nation's post-war reconstruction, it might be considered prudent to broaden the character of the Commission by including an economist, an industrialist, a banker, a trade union leader, and an architect. James Barrie would have included a romanticist, and perhaps even a patient.—I am, etc.,

London, W.1, Jan. 18. S. L. SIMPSON.

SIR,—On reading through the list of names of the Medical Planning Commission I, for one, was surprised at its composition, "for the purpose of reconstruction and reorganization in the field of medicine in the great war era." I made a rough division, and find there are twenty-nine specialists, twenty-three town members, and one county member. I have no objection to any of these names, but there are many serious problems in the country which require serious consideration, and country practice is not the same as a town one. How many of the specialists have a working knowledge of country practice and institutions?

It is surprising that the B.M.A. Executive Committee had not considered this in their selection. I see they have the power to co-opt extra members. It is to be hoped they will give consideration to the country practitioners' representation. No scheme will be complete without serious consideration of the many problems in our country districts.—I am, etc.,

Bicester, Oxon., Jan. 8. J. HOLMES.

SIR,—Dr. Alfred Cox writes in his congratulatory letter (January 11, p. 61) that he is particularly interested in your announcement that the "vision and aspirations of the younger men and women will not be overlooked," a view which is shared by many of us older ones. Dr. Cox states also that "there is always a risk that the minds of the older men, particularly when habitually immersed in medical politics, will become polarized. It is not easy [Dr. Cox says] for such men to get away from the ideas and technique of our 'proposals for a National Medical Service.' But it must be done." Such a statement from a past secretary of the British Medical Association, with long experience of medical politics, carries great weight and must be regarded as a serious warning to us all.

With this in view may we be informed (1) of the average ages of those who compose the Commission; (2) whether such youthful bodies as the "Socialist Medical Association," the "United Hospitals Socialist Association," and others will be invited to express their formal views of the proposed organization of the medical service for the nation (as they have given this their earnest consideration in the past); and (3) whether all allied and auxiliary medical services that exist, together with the laity concerned, will be consulted by the Commission in its work?—I am, etc.,

Woking, Jan. 13. F. G. BUSHNELL.

SIR,—The Medical Planning Commission has been appointed. This is a pity, because having more or less elected itself and having become "first in the field" it is unlikely to be supplanted by any other more representative organization. The present Commission savours too much of London and the big cities, too much of highly placed medical legislators and more or less whole-time administrators, and far too little of men who actually do the medical work of the country and by their experience realize the failings of medical organizations in their own areas as they exist to-day.

One of the first and most important duties of a Medical Planning Commission is to unite the three separate bodies which are drifting further and further apart—general practice, hospital services, and public health administration. No medical planning can ever be really efficient until these bodies are organized to work together, and to work together amicably and in a way complementary to one another.

The real pity about the appointment of this Commission is that machinery exists throughout the country to form a body thoroughly representative of the various kinds of work of all areas, including both members and non-members of the B.M.A. or any other medical organization. I refer to the Local Medical War Committees. These committees represent every kind of medical work of relative local importance, and, what is more important, they are in touch with all the present-day problems. Surely a body could have been elected from these committees representative of the services already mentioned, and to this body one or two medical autocrats and bureaucrats could have been added—not for use, but to give colour—a matter which would weigh far more with those Government Departments with which they would at any time have to negotiate.—I am, etc.,

Reading, Jan. 17. STANLEY C. ALCOCK.

SIR,—In October of last year a Local Medical and Panel Committee had a short discussion on some literature issued by the Medical Practitioners Union, and as a result drafted a letter to the B.M.A. asking for information and guidance. A reply came back that further information would be had in about a fortnight, but nothing further was heard until the publication of the composition of the Commission. What is the composition of this Commission? In the list of some sixty-eight names there are those of many consultants, members of the Council of the B.M.A., and representatives of the various learned bodies. But what of the poor general practitioners, who must number about 80% of the medical men in harness? These are the men who will be expected to work any scheme, and yet I can only pick out six or eight names of men who appear to belong to this class, and some of these are rather doubtful.

In his letter (January 11, p. 61) Dr. Alfred Cox appears to have some misgiving that the Commission will fail in its object, or, as he puts it, become "polarized." I am quite sure that to many of us Dr. Cox's fear is a certainty, if the composition of the Commission remains as at present. One can visualize many lengthy sessions of brilliant speeches by men whose knowledge of the life and work of the average G.P. is in inverse ratio to their knowledge of medicine or surgery, and who are inclined to think in terms of guineas rather than shillings. Then would follow a wonderful scheme, which the Government of the time would probably turn down at once as unworkable, and after that, silence.

I notice that the Ministry is to be asked to appoint "observers." What would they do? Where are your financial experts? After all, any scheme of this nature depends upon finance. Surely a Commission of this kind should consist of a *limited* number of G.P.s, rural as well as urban, and representatives of all the various branches of medicine and surgery. What about the men who for the last twenty-seven years have run the National Health Insurance Act and made it the success that it is to-day? If a State service comes it will be based upon and include the present panel system. Good representation of this class of men would ensure the elimination of the worst features of that scheme.

If this letter reads as a reflection on the actions of the B.M.A., it must be remembered that to many of us the only positive action was the voluntary giving up of a portion of our panel capitation fee at the time of the slump, as a "patriotic gesture."—I am, etc.,

Worthing, Jan. 16. H. DUNDAS MCCALL.

Medicine in a Changing World

SIR,—The article by Sir John Orr (January 18, p. 73) has opened up problems of the first importance not only to medicine but also to the whole sociological and economic life of the country, and I should like, with great respect, to express my disagreement with the comments in your leading article (p. 91).

You do not deny Sir John's affirmations that "the medical profession contains within it experts on every subject that affects human welfare" and that "it is the only organized group of men competent to make a statement on human needs," but you criticize and emasculate them, deprecate what you call "contamination" by political partisanship and economic theorizing, and advise that the cobbler should stick to his last.

Clearly and self-evidently, if these propositions are true, it is not only expedient for the profession to take an active part in political and economic problems but it is its bounden duty to do so. Calling this political partisanship is merely evading a vital question. Politics has become now literally a matter of life and death to the individual, and it is certainly time that it was taken out of the hands of party organizers and placed on a scientific basis, to be studied and organized strictly by the scientific method. We don't speak of partisanship in considering medical and other scientific questions. Opinions on these subjects are regulated by the evidence for and against. Economics and politics can be no exception and should be in the hands of people trained to deal with problems on scientific lines.—I am, etc.,

London, W.1, Jan. 18. FREDERICK DILLON.

SIR,—The stately caveat administered in the third leader of your issue of January 18 (p. 91) will, it is hoped, come as a shock and a disappointment to many of your readers.

Sir John Boyd Orr suggests (p. 73) that the medical profession should make, as its contribution towards post-war reconstruction, an authoritative statement upon the reorganization of our social and economic system necessary to satisfy the health needs of the whole population. Your leader writer advises, on the contrary, that in a changing world "the cobbler must stick to his last" and that the profession should enunciate desiderata without concerning itself with their realization:

> "They murmured as they took their fees,
> There is no cure for this disease."

To justify this aloofness an extravagant compliment is paid to political movements. We are told that if a scientific contribution of the kind suggested were made we, as a profession, should become politically allied. I think this is to misread the suggestion. Political movements provide marching songs, and sometimes lullabies, but a determined public opinion and expert

advice are necessary to the building of roads. Who should advise us to how the road to national health should be built if not the medical profession?

For more than a quarter of a century the medical services of the country have been left in a state of arrested development largely because no satisfactory system has been evolved for payment for the medical care of the dependants of insured persons. Are we to wait through another quarter of a century for accepted standards regarding nutrition, housing, mental development, and fun and games to become actualities while others fail to discover how they are to be paid for?

Whether we like it or not, a point has been reached at which medicine must take into consideration and bend to its will the science of economics as it once, though not too willingly at first, absorbed and made triumphant use of the discoveries of Pasteur.

Please, please, Mr. Editor, take your head out of the sand, in a changing world, and give us another leading article—I am, etc.,

Potters Bar, Jan. 19. MAITLAND RADFORD

*** But why walk with one's head in the clouds?—ED. *B.M.J.*

Treatment of Carcinoma of the Cervix

SIR,—Sir Alfred Webb-Johnson, when discussing carcinoma of the cervix in his recent Bradshaw Lecture, tabulates (January 11, p. 40) certain published figures of mine giving the results I had attained by Wertheim's operation up to 1928. I have recorded such results from time to time over a period of many years, and have always divided my cases into two groups: (*a*) those in which the regional glands were free of carcinoma; and (*b*) those in which they were carcinomatous. This is a classification based on facts ascertained in the operating theatre and histological facts in the laboratory, whereas the radiological classification of the cases into four stages is merely founded on clinical opinion and has a wide margin of error.

I have repeatedly pointed out that no true comparison can be made between cases whose grouping is so differently arrived at. The radiological classification is founded solely on the extent to which, in the opinion of the examiner, the primary growth in the cervix has spread, but there exists no fixed relation between this and the state of the regional glands, for they may be carcinomatous when the cervical growth is still very small, and, conversely, may be free when the cervical growth is most extensive.

Judge, then, my dismay when I see 212 operation cases of mine in which the glands were not involved lumped together by Sir Alfred into Stage I of the radiological classification (a stage restricted to very early growths entirely within the cervix), and my cure rate set down as applying to that stage alone, whereas in fact the greater number of the cases would, on the state of the cervix, have been radiologically classified as belonging to Stage III.

My five-year cure rate for all the cases I have operated on stands at present between 40 and 43%, according to whether cases lost sight of or dying of other disease are or are not included in the calculation. This result has been pretty constant since I began to do the operation, varying a little one side or other of 40%, from year to year, as luck was for or against. It might be surmised that the lowered operative mortality would increase the percentage of cures, but it does so only slightly, because the saving in this respect has chiefly affected the more advanced cases, which, if the patients survive the operation, add to the number of recurrences later on.

Moreover, my results as regards cure are about the average, being much the same as those recorded by other surgeons who have published theirs, and, indeed, such similarity is to be expected seeing that the method of cure (the operation) does not materially differ in different expert hands.

It is ill arguing from exceptions, and the main radiological figures which Sir Alfred quotes are incomparably better than the average results of radiation therapy as carried out by other institutions in this country under the direction of experts of established reputation, of which that at the Middlesex Hospital, in the charge of my most clever and conscientious colleague Mr. Windeyer, may be taken as an example.

Whether it is best to treat a case of carcinoma of the cervix by operation or by radiation (presuming the proper performance of either is at command) is a question whose answer needs much more knowledge and consideration than Sir Alfred has given to it.—I am, etc.,

Hereford, Jan. 13 VICTOR BONNEY.

Pride and Prejudice in the Treatment of Cancer

SIR,—Sir Alfred Webb-Johnson in his Bradshaw Lecture calls attention to the urgent need for radiotherapists to implement the provisions of the Cancer Act. Having been for many years examiner and lecturer for the Cambridge D.M.R.E. I have long foreseen that this difficulty would arise. During the four years ending 1938 the total intake of medical students in this country was about 10,000. During the same period the number who took the Cambridge diploma was 87. Of these, 29 were from over-seas, leaving 58—a yearly average of 14.5—from the British Isles. To these must be added the still smaller number who have taken the diplomas of other bodies, but from the total must be deducted the great majority who prefer x-ray diagnosis to therapy. These figures show that under present conditions there is not the smallest hope of providing the "great army of workers" which Sir Alfred considers essential.

There being no lack of facilities for instruction, the cause of this deplorable state of affairs clearly lies in the unattractiveness of conditions and prospects. The following, based on discussion with a number of experienced radiologists, appear to be the main reasons.

1. No one will deny that the advent of radiology in its twofold purpose has been one of the few great revolutions in medicine. In spite of this radiology has acquired in this country no academic status. It has no College of its own. Of university chairs there are none; of lectureships only one or two. In this respect we are lamentably behind all other great countries.

2. Many of the patients whom the radiotherapist sees come to him too late, either through their own neglect or through the failure of operative measures. His work lies largely among those whom the surgeon has discarded. However interesting it may be, it must have a depressing effect on those who practise it unless they are possessed of a sanguine temperament.

3. It is found that patients of moderate means can often afford fees for a surgical operation, but afterwards, when radiotherapy is found necessary, their means are exhausted and they become hospital patients.

4. Sir Alfred's liberal views on the proper status of the radiotherapist are not by any means universally shared. The attitude which is all too common was typified by a recent speaker at the Royal Society of Medicine who described radiotherapy as the "handmaiden of surgery"! It is the general experience that when a surgeon sees a patient and finds that he cannot operate, or that an operation which he has previously performed has been unsuccessful, he advises the patient to have *x*-ray treatment. When the patient reaches the radiotherapist the latter's course of action has virtually been decided for him. He may know better than the surgeon that the patient has reached the stage when *x*-ray therapy can do him more harm than good. But the surgeon's opinion has impressed itself so strongly upon the patient and his relations that it is very difficult for the radiotherapist to express a contrary opinion without running the risk of being thought disobliging. Late cases are frequently referred for *x*-ray treatment "so that the patient may feel that something is being done." Is the radiotherapist to give treatment against his judgment, or is he to deceive the patient by putting him under the tube without switching the current on? Why should not the surgeon perform a dummy operation? A course of *x*-ray therapy is the equivalent of a surgical operation. It has a definite curative or palliative object, and should not be carried out for any other purpose. As I have said elsewhere, the *x*-ray department is still regarded as the ante-room to the post-mortem room.

The greatest need at the moment is a fundamental change in attitude towards radiotherapy. Sir Alfred's dream will not materialize until pride and prejudice give place to sense and sensibility.—I am, etc.,

Cambridge, Jan. 17. FF. ROBERTS.

Effort Syndrome

SIR,—The two cases quoted by Dr. Middlemiss (*Journal*, December 28, p. 915) as examples of effort syndrome read so like cases of masked thyrotoxicosis that, as one who, having operated upon a number of such cases, has been impressed by the gratifying results of partial thyroidectomy, I feel constrained to raise the possibility. The "full" thyroid, tachycardia, and tremors of Case I, constituting three of the cardinal signs of Graves's disease, and the shortness of breath, tachycardia, and attacks of palpitation which followed an acute emotional disturbance (sudden death) in Case II are at least suggestive. These remarks are manifestly open to the criticism that I have not seen the cases quoted, but my object in making them is to draw attention to the importance of not overlooking masked thyrotoxicosis.

For determining the presence of this condition I have found the following three lines of investigation valuable: (1) Is the condition better in cold weather than in hot, and has the patient a good appetite in spite of the disturbances complained of? (2) What is the reaction to the adrenaline test? (Details of this have been previously and elsewhere recorded.) (3) What is the effect of small doses of iodine given over some weeks?

If the answers to these questions indicate a thyroid origin for the symptoms a good result can be predicted from thyroidectomy, and such patients may not only be rendered fit for general service but protected from a long period of invalidism.—I am, etc.,

Dec. 30. LAMBERT ROGERS.

Treatment of Bronchopneumonia in Infants

SIR,—Dr. A. Morton Gill's article (December 28, p. 900) was both interesting and of immediate clinical importance at a time of the year when an increasing number of cases of respiratory tract infection are occurring. I would, however, like to pass some comment on it, based on my personal hospital experience, because I feel that an increase in the dosage of sulphapyridine above the doses recommended by Dr. Morton Gill will result in a reduced mortality rate.

From November, 1938, to May, 1939, I collected a series of 160 consecutive cases of pneumonia to study the effect of treatment with sulphapyridine, and case papers for previous years were most carefully scrutinized to obtain comparable figures for cases treated without chemotherapy. From the figures then obtained I have now taken the cases of bronchopneumonia under the age of 1 year to compare them with the results published in your article.

Series	Cases	Deaths	Mortality
Dr. Morton Gill	11	4	36%
1937–8 (before chemotherapy) ..	17	8	47%
1938–9..	18	3	17%

My two series of cases are quite unselected. They include all patients with bronchopneumonia under 1 year of age that came for treatment from November to May in the years under discussion. In my cases from 1938 to 1939 I believe the relatively low mortality to be due to adequate chemotherapy. I did not use oxygen tents as a routine, and indeed I am of the opinion that the omission of oxygen with an easy mind is one of the advantages of treating pneumonia with sulphapyridine. The general nursing and feeding of my cases were much the same as Dr. Morton Gill's. The one essential difference was in the use of very much larger doses of sulphapyridine. The following four cases illustrate the doses employed.

(1) An infant, 19 days old, admitted on the third day of illness, had 1/2 gramme four-hourly for three doses, then 1/4 gramme six-hourly for three days.

(2) An infant 4 months old was given 1/2 gramme four-hourly for four doses, and 1/2 gramme eight-hourly for three days.

(3) An infant 3 months old, desperately ill on admission, was given 1 gramme, then 1/2 gramme four-hourly for four doses and 1/2 gramme eight-hourly for three days.

(4) An infant 9 months old had 1/2 gramme four-hourly for six doses and eight-hourly for three days. This infant was readmitted six weeks later with lobar pneumonia, and recovered after receiving 1 gramme on admission, 1/2 gramme four-hourly for six doses, and eight-hourly for three days.

It may well be that if the fatal cases in Dr. Morton Gill's series had received doses of this order for the first day of therapy the outcome would have been satisfactory. I believe that it is essential to give bigger doses early, and that it is then permissible to reduce both the dose and the frequency of administration. Thus Case 4 quoted above had 3 grammes in the first twenty-four hours, and a total of 7½ grammes, whereas Dr. Morton Gill's Case 7 had only 1¾ grammes in the first day. It seems to me certain that it is useless to endeavour to make up the total later in the course of treatment. This is the generally recorded idea in most chemotherapy, and it is well known that there is a risk of producing a drug-resistant infection by giving inadequate quantities at the start of treatment. I have never had cause to regret the administration of large doses to the smallest infants, and have given 1-gramme doses to an infant of 1 year with no ill effect on many occasions.

In treating lobar pneumonia in adults I have adopted the same type of changing dose. Since November, 1938, my adult cases have received an initial dose of 2 grammes, then 1 gramme four-hourly for four doses, and eight-hourly for three days. In the first eighty-four cases between the ages of 5 and 70 it was necessary to modify this course of treatment in ten cases only, and there were five fatal cases. It would be of considerable value to learn what doses other clinicians are using, both for infants and for adults.

I must thank the Medical Officer of Health for London for permission to publish these figures. He is in no way responsible for the views expressed in this letter.—I am, etc.,

London, S.E.10, Jan. 6. ALEXANDER KAHAN.

Malaria among Merchant Seamen

SIR,—In an interesting clinical memorandum (January 4, p. 14) on a case of malignant tertian malaria Drs. J. Fawcitt and A. H. Walters mention that there have recently been a number of deaths from this disease in several dockside hospitals. As there is reason to believe that in the immediate future there will be an increasing number of merchant seamen returning to this country at short intervals after calling at a malaria-infested port, the necessity for being on the look-out for this disease should be borne in mind by those doctors who may be called upon to treat merchant seamen in their homes and elsewhere.

This was brought home to me by a recent experience. A few weeks ago I was asked to go out to a troopship and examine some sick members of the crew. In the ship's hospital I found ten seamen who had been ill for about a week. Their illness had been diagnosed as gastric influenza. One man had died that day, and three were dangerously ill. All had more or less high temperatures, and vomiting was present in nearly every case. I found that the ship had called at a certain African port on the way home, and this suggested that malaria might be the right diagnosis in at least some of the cases. Owing to a shortage of the necessary materials I was unable to examine the blood of all the sick cases, but I was able to make films of the three worst ones, and had no difficulty in finding the rings of malignant tertian malaria. These three were immediately given injections of quinine. One of them died about twelve hours later without showing any response. A sample of his blood after death still showed a very heavy infection with rings. The two others remained dangerously ill for about twenty-four hours after receiving three injections each, then began to improve rapidly. The change in their condition when I visited them a few days later was most impressive. The rest of the patients were given quinine by the mouth and all made an uneventful recovery.

The danger of missing the diagnosis is increased when a seaman arrives in a home port feeling ill but unwilling to give up his home leave. He may then consult a doctor who is unaware that he is a seaman or has been recently in a malaria-infested port.—I am, etc.,

Paisley, Jan. 12. A. GARDNER.

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In an article entitled "Muscular Rheumatism—Local Injection Treatment as a Means of Rapid Restoration of Function," published in the "British Medical Journal," 10.8.40, page 183, the author describes the treatment of a number of typical cases of Fibrositis, etc., in different parts of the body and *in all cases* immediate relief was obtained following injections of Novutox. During an attack of lumbago suffered by himself the author found one injection abolished intense pain and restored function within a matter of minutes. He also gives useful detailed information of the technique employed for the various sites of the body.

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Sterilization of Dressings and Post-operative Tetanus

SIR,—The recent paper by Lieut.-Colonel S. N. Hayes on imperfect sterilization as a probable cause of post-operative tetanus (December 14, 1940, p. 825) raises a point of great interest and importance, especially at the present time.

A number of years ago a careful study of the conditions underlying efficient sterilization was made at the Jessop Hospital for Women, Sheffield, and an outline of the results obtained—which were in close agreement with those of Colonel Hayes—was published at the time (*British Medical Journal*, June 20, 1925). The outstanding importance of a really loose packing of dressings in the drums used as containers was clearly demonstrated there. The technique of sterilization adopted in this hospital since that time has been based on the results of these studies, and, as the details have been developed by further trials in the last few years, it may be of interest to state the precautions that are now adopted here with a sterilizing plant using steam from the hospital boilers.

1. The sterilizer is fitted with an automatic pressure and vacuum recorder which produces a written chart of the operations. These charts provide a check on the handling of the sterilizing plant and are kept as records.

2. At the beginning of the sterilizing process air is evacuated so far as possible and steam is then admitted to full (20 lb.) pressure for two or three minutes. Steam is then shut off and the sterilizer is re-evacuated, after which steam is again admitted and a pressure of 20 lb. maintained for twenty minutes or more. The object of the double evacuation is to replace the air contained in the dressings by steam more effectively. Numerous trials have shown that complete removal of air is not obtained by the first admission of steam, and this re-evacuation followed by the readmission of steam at the same pressure for twenty minutes or more has shown that the penetration of the steam is much enhanced by this manœuvre.

3. However carefully the sterilizing plant is operated, defective sterilization may still ensue if the goods have been packed too tightly in the drums or if the holes in the drums have not been opened. An internal check is therefore always employed by including in the centre of each drum a control tube (the Browne sterilizer control tube—a development of the control described in the 1925 studies) which changes colour as sterilization proceeds. The timing of the colour change has been adjusted to leave a wide margin over the thermal death points of tetanus spores as determined in the studies of Murray and Headlee (*J. infect. Dis.*, 1931, **48**, 436). The colour of the control tube is inspected when the drum is unpacked in the theatre and doubtful batches are unhesitatingly rejected.

By these means it is hoped to ensure that no batch of dressings will be used that is not certainly sterile.

The use of the control tubes, with their positive evidence of the application of steam for an adequate time, can always be retained, even under the simplest conditions, where the full technique is not possible.

To summarize—the use of the recording apparatus to check the work of the technician or nurse responsible for the sterilizing and to give him/her confidence in the manipulations, the employment of double evacuation to ensure rapid and adequate penetration of the steam throughout the materials, the loose packing of these, and the consistent use of the control tube as the final check accessible to the surgeon himself, provide a security which is well worth a little trouble and expense to attain.—I am, etc.,

Sheffield, Jan. 11. JOHN CHISHOLM.

Treatment of Scabies

SIR,—It may be of interest to those who may have to treat this troublesome complaint, especially in communities and institutions, to hear of my experience.

About the middle of the last war I was the only A.M.O. in a large mental hospital. We were very overcrowded, having had some drafts of patients in from other hospitals, and the nursing staff was depleted. During the early warm weather of one summer I detected some cases of scabies in a female ward of about sixty chronic and turbulent cases, the worst possible type to co-operate in any treatment, many of them being actively obstructive. The usual treatment—sulphur ointment and baths—was given, but fresh cases kept recurring. I also tried Vlemingkx's lotion, but this seemed to cause eczema in some cases.

I was getting rather desperate, but on reasoning from the fact that sulphur taken internally will cause silver articles and coins carried on the body to turn black, and that this is due to H_2S exuded from sulphur in the skin, and that fighting on internal lines of communication was just as topical then as it is now, I gave every patient in the ward a teaspoonful of confection of sulphur every day. The result exceeded my expectations. Within three or four days there were no more fresh cases, and within about ten days the ward was clear.

The patients took their confection willingly—maybe they had some unconscious urge to take it. The only complaint came from the nurses, who said the ward stank like a gasworks, and they were not much comforted when I pointed out that a gasworks was a very healthy place to live around, but they all worked very well and loyally.

Perhaps those people of past generations who used to dose themselves and their families with brimstone and treacle had more ideas in their method than the warding off of spring vapours and cleansing the blood. I cannot be dogmatic about this internal line of treatment as the external procedures were used with it; the time was not opportune for experimenting with controls, but in my own mind I have no doubt about the efficacy of it.

I do not know if this method of treatment is original, but I do say that I have never heard or read about it in any ordinary textbook; perhaps I have not delved deep enough into the subject.—I am, etc.,

Croydon, Jan. 14. H. M. BERNCASTLE.

Recurrent Attacks of Herpes

SIR,—The following case seems to be worthy of publication because of the rarity of such a condition and the apparent lack of any cause.

The patient, an ordinary seaman aged 22, suffers from recurring attacks of herpes of the left auricle. These occur every October without fail and the course is always the same. First blisters are noticed; then slight pain develops in the upper part of the sterno-mastoid muscle: finally both pain and blisters disappear after about two weeks. It is never complicated by sepsis; it never occurs except in October; it has happened as long as the patient can remember.

On examination the patient seems to be a perfectly ordinary individual of good physique, and with no detectable nervous lesions or other possible conditions which might account for the herpes. I got the impression, while taking the history, that the patient was truthful, and his story has remained consistent in spite of trap questions. The only explanation I can offer is that the condition is psychological in origin, but I have not had the necessary experience to investigate properly this side of the question. It is interesting to note that his birthday is in October. There is a history of mumps and measles as a child and tonsillitis three or four times, the last attack being seven years ago. There is no history of injury. The family history is also negative. The father died two years ago from a gastric haemorrhage: the mother, three brothers, and one sister are all alive and well. None of the family or their acquaintances had ever had herpes except the patient.

I would be very interested to hear from any who have seen cases of this nature before.—I am, etc.,

J. F. BURDON,

Oct. 22. Surg. Lieut., R.N.V.R.

Surgery in a Tented Theatre

SIR,—I was much interested in Major Rex Binning's description of surgery at No. 3 General Hospital (December 7, p. 794), but I would remind him that No. 20 General Hospital was even more a tented one than No. 3, as the whole hospital, including the operating theatre and the pathology department, was under canvas. The operating theatre was in an eight-section expanding hospital tent, with single walls but double roofs, which by means of spare wall sections was partitioned into three divisions, each division being subdivided

as follows. At one end: (1) a surgeon's changing room; (2) sisters' duty room; (3) sterilizing room; (4) storage. At the other end: (1) an anaesthetic room; (2) another storage room; (3) an alcove, which gave access to a covered tented way into the adjacent hospital ward, also of eight sections. In the centre was the theatre itself, with ample room for two tables.

We were also apprehensive about infection from dust, etc., but we believe that the risk was considerably minimized by an ingenious arrangement, devised by Major Ward and Major Ghey, whereby the greater part of the theatre proper was enclosed in an inner tent made entirely of linen sheets. This inner tent was suspended from the roof. The lighting was electric from a petrol-driven engine outside the theatre. The bulbs, magnified by reflectors made from petrol tins, were fastened to a wooden frame attached to two of the upright tent poles. By a system of pulleys this could be tilted and directed at different angles. For what such evidence is worth, it may be noted that 8-inch plates were exposed in the theatre, but after twenty-four hours only grew a few colonies of *B. subtilis*, sarcinae, and moulds. No pathogenic organisms were grown.

Though our period of functioning was much shorter than that at No. 3, our list of operations, which included an appendicectomy and a mastoidotomy, showed no post-operative infection and remarkably little post-operative pulmonary complications. I heartily agree with Major Binning that the method of working proved a very valuable experience, and enabled us to realize how, by ingenuity and improvisation, a high and successful standard of surgery can be maintained even in a tented theatre.—I am, etc.,

CHARLES H. BUDD,
Colonel, R.A.M.C.

Dec. 16.

Treatment of Jaw Injuries

SIR,—I have just noticed a letter on jaw injuries by Mr. E. D. D. Davis (April 27, 1940, p. 710). He mentions that at Rouen (presumably in the last war) an efficiently equipped dental department did excellent and skilful splinting and treatment of jaw injuries. This department, which I had charge of, provided all the early treatment he advocates. About one thousand compound fractures of jaws and severe facial injuries passed through. The grouping of these cases shed a light on the best treatment of haemorrhages, and the prevention of septic pneumonia, that deadly bugbear of *pre-prontosil* days. Early suturing was the rule, and sometimes a splint would be introduced and suture undertaken under the same anaesthetic, although local anaesthesia was generally the choice.

I offered to undertake the same work before and after the outbreak of this war, but apparently such a grouping of cases is not desired, although one would think that cases in the Middle East might well be spared the puckering deformities of delayed treatment and splinting.—I am, etc.,

H. E. H. TRACY,
i/c Oral Dept., B.E.F., 1916–19.

Halton Camp, Bucks, Jan. 7.

Convulsion Therapy in the Out-patient Department

SIR,—Dr. E. B. Strauss's letter (January 4, p. 31) casts an unwarrantable aspersion on institutional psychiatrists which cannot be allowed to go unchallenged. I am unqualified to speak on the question of electrical convulsant therapy, but from a fairly extensive experience of other methods of "shock" treatment I am prepared to admit the practicability of its application to out-patients. (Some years ago in Vienna I saw insulin therapy given to out-patients apparently quite successfully.) However, Dr. Strauss seems to consider that British psychiatry does not exist outside London. The majority of mental hospital superintendents throughout the country are "consultant psychiatrists," and their out-patient clinics are, I believe, almost invariably held at the nearest general hospital. It is difficult to understand, then, why the cases seen by them should differ materially from those attending Dr. Strauss's out-patient department. A study of the annual reports of the "more progressive mental hospitals" shows clearly the excellent work being done and the large number of cases in which the necessity for mental hospital treatment is avoided. Further, with the many new admission blocks which are now attached to mental hospitals it is possible to admit early cases to pleasant surroundings, where they can receive skilled nursing attention and in which they tend to recover more rapidly than do those who prefer to receive their treatment as out-patients. Thus it is sheer nonsense, and displays a complete ignorance of the existing facilities in almost every county, to suggest that the institutional psychiatrist does not know what early mental disorder is like. One is tempted to ask whether those psychiatrists who see practically nothing but early cases are capable of giving an accurate prognosis, as they are apt to forget, if they have ever known, what an advanced psychotic patient is like.

With regard to the early development of "asylum psychosis," I have yet to see a case of this curious disorder; the number of patients who after their return home write gratefully of their treatment and their readiness to attend for "follow-up" observation suggests that it is at any rate of no serious significance, if it exists at all.

Lastly, should one speak of voluntary patients being "compelled" to enter hospital?—I am, etc.,

J. C. SAWLE THOMAS.

The Mental Hospital, Berry Wood,
Northampton, Jan. 13.

SIR,—As one associated with the introduction of the electrical convulsant treatment to this country from its inception, and who, together with my colleagues at Warlingham, has induced over 1,600 major fits upon some 130 patients since November, 1939, I feel constrained to venture an opinion regarding this out-patient application controversy. I do so with complete freedom from personally conditioned viewpoints, having practised this treatment under both in-patient and out-patient conditions with facilities for both.

Putting aside ingenious objections and unique occurrences, I know of no valid reason why electrical treatment should not be applied in the out-patient clinic by a competent psychiatrist. This is intended as a broad generalization and one based upon sheer experience—albeit predominantly institutional. That danger exists of this treatment becoming commercialized I can envisage, though that is another matter. There is danger, too, of indiscriminate application, a danger which will grow less as our criteria of selection improve—and improving they are.

One precaution we observe as a condition for out-patient treatment—namely, that every patient so treated shall be escorted by a responsible relative or friend. This precaution arises not from any of the alleged drawbacks hitherto mentioned, but because of amnesia, which in varying degrees is a transitory post-therapeutic phenomenon constantly observed.

I would add that 75% of our admissions to the Warlingham Park Hospital last year were voluntary, and from these a large proportion electrically treated were drawn. The cases treated latterly, in short, differ in no way from the out-patients and cannot be regarded as institutionalized.—I am, etc.,

WM. H. SHEPLEY.

Warlingham, Jan. 13.

Tuberculosis and Shelters

SIR,—I was glad to see Dr. C. K. Cullen's letter (January 11, p. 61) regarding the Ministry of Health's suggestion for dealing with cases of open tuberculosis known to frequent public shelters. It seems to me that the difficulties in connexion with compulsory removal to hospital of such cases have not been fully realized. By what means are such cases to be discovered? Are the confidential notification registers to be used for this purpose and the tuberculosis officers expected to act as public informers? If this is so (and apart from such a method I fail to see how cases of open tuberculosis are to be discovered), then, however unwittingly, the tuberculosis service will be dealt a death blow.

Since its inception this service has been built up on the confidence the public have shown in the dispensaries, and this confidence will be gravely impaired. People who normally are referred to a dispensary for investigation will fear to attend in case they are found to be tuberculous and be forced to accept institutional treatment because they happen to use a public shelter. Also, as Dr. Cullen points out, it will bring about the disappearance of patients from dispensary supervision. Let it be understood that once the dispensary service

loses the confidence of the public it will take many years to regain such confidence, and during the post-war period, when tuberculosis may increase, we shall find that fresh cases will not be brought to light until they have advanced beyond curability, and who meanwhile will have been infecting other people.

Although one recognizes that the tuberculous in shelters do present an undoubted danger to the general public, it seems to me that this is much exaggerated. From knowledge of East London, I am aware that only a very small number of known cases of open tuberculosis do, in practice, frequent public shelters in that area. Give the open cases of tuberculosis adequate alternative sheltering adapted to their condition and sufficiently attractive—that is, warm dry well lighted, and with a modicum of safety—and the few open cases of tuberculosis at present using public shelters should be easily persuaded, without compulsion, to use it.—I am, etc.,

London, E.1, Jan. 14. R. M. ORR-EWING.

Opening the "Register"

SIR,—The Press announces that two Orders have been made authorizing the inclusion of oversea doctors temporarily in the *Medical Register*. The first Order applies to doctors qualified to practise in Canada or the United States who are *wanted in the Emergency Medical Services*. The second applies to doctors qualified to practise in any part of the British Empire or in the countries of our European Allies, or in Germany or Italy. These men are *wanted* for service with the Allied Forces and *in approved hospitals*. Except doctors from Canada or other parts of the Empire who are British subjects, and to whom my remarks do not apply, the doctors to whom these two Orders refer are aliens. The italics are mine, and to some of your readers it may be news that doctors are *wanted* in the sense of their services being urgently needed to supply a want, either in the Emergency Medical Services or in approved hospitals.

In the London area I and those of my medical friends with whom I have compared notes complain of lack of work: the authorities will add to our discontent if any alien doctor is given any work so long as that work could be equally well done by a British doctor who is in need of employment. This may seem ungracious, but Justice has precedence over Charity—I am, etc.,

London, W.8, Jan. 15. HALLIDAY SUTHERLAND.

"Egyptian Tummy"

SIR,—I have read the various letters on the above condition and wish to add my observations. Drs. Leigh Canney and V. S. Hodson (January 11, p. 64) both ascribe this ailment to meteorological causes—namely, the rapid cooling of the body surface. During my experience as a ship surgeon on Indian and African voyages I came across this condition, which I diagnosed as a "chill," each time we came into hot weather. In every case there were two common factors exhibited: (1) each patient was making a first trip into the Tropics; and (2) each was upset by the heat and slept with either the minimum amount of clothing or none at all, and allowed the electric fan to play directly on the body.

The symptoms of three cases were those of lower abdominal pain associated with frequent and painful micturition. The remainder, about ten cases, displayed generalized abdominal pain of a "colicky" type associated with diarrhoea and malaise. In the first group chemical examination of the urine failed to detect any traces of albumin. In the second group, owing, unfortunately, to the complete lack of apparatus, etc., no bacteriological examination of the stools could be made. Questioning in each case established a negative history for dysentery or allied enteritic conditions, either recent or remote. This, coupled with the common factors mentioned above, led me to make a diagnosis of "chill."

I made inquiries about this condition from one or two ship's officers who had been on tropical voyages for several years, and they assured me that it was fairly common in "first trippers" when they first met really hot weather. The advice they had always given was to allow the fan to play directly on to the bulkhead above the bunk instead of directly on to the body, thus disseminating the force of the draught and reducing the rate of cooling, and always to cover the abdomen with something, such as the sheet rolled round like a diaper. Treatment, which was successful, consisted of local warmth in the shape of a scarf or binder wrapped round the abdomen, mild gastric sedatives, light diet, and the advice about the draught as given above.—I am, etc.,

Glasgow, Jan. 14. T. T. FERGUSON.

Perspiration and Flannel Clothing

SIR,—Dr. Leigh Canney's letters to your *Journal* (December 7, p. 806; January 11, p. 64) sound exceedingly practical, and lead me to relate a chance discovery with regard to flannel clothing in any perspiring patient.

An embryo medical student returned from a lecture by Mr R. Ablett, M.Sc. (Lecturer in Physics, Liverpool University), and related how he had demonstrated the high temperature which is created when there is a change of surface tension as moisture replaces air in flannel. Take a clinical thermometer, wrap round it a thin strip of dry flannel, place it in the mouth, and in five minutes the temperature registered by the thermometer will be 106 to 110° F. This is the temperature of the flannel and not of the mouth. An amazing temperature, therefore, will be recorded in any patient who is allowed to suck a dry handkerchief, or any part of clothing should the thermometer touch this clothing. If the axilla is dried and the thermometer and a piece of dry clothing placed in the axilla the same occurs. It has long been customary to place all sweating patients between blankets, and if these are changed when wet we are keeping our patients in a warming apparatus far superior to any electrical device.

Dr. Leigh Canney's patient was sweating in a thin nightdress. That warm Turkish towel saved her life. He is to be congratulated upon his observation.

I would like to thank Mr. Ablett for his scientific explanation.—I am, etc.,

Liverpool, Jan. 13. R. KENNON.

Human Fertility

SIR,—I was much interested in Dr. John Pryde's article (January 4, p. 12) on the study of human fertility, and in Dr. J. D. Flew's letter (January 11, p. 66) citing two cases which came under his observation and which seem to point in the opposite direction to Dr. Pryde's conclusions.

May I record a case which came under my observation a few days ago: A young married woman with one child aged 3 years living. Two previous miscarriages, the last occurring in July, 1940. Following this there was a normal menstrual period commencing on August 7, 1940. (She has a regular cycle, 5/28.) Her husband is on active service and returned for ten days' leave prior to embarkation on August 26–September 3. Coitus occurred each night during this time, which therefore was *after* the "safe period of Knaus." In this case the fertile period should have been August 17–22. On examination she was approximately twenty weeks pregnant.

In the present state of our knowledge I don't think we can rely on this "safe period."—I am, etc.,

Lydd, Jan. 15. RUPERT PALMER.

Medical Examination of Home Guard

SIR,—In reply and contradiction to Dr. L. J. Forman Bull (January 11, p. 65), may I point out that at least in the Salford Battalion of the Home Guard voluntary medical inspection of every volunteer has been in force for two months. The men have as full an examination as circumstances permit, but they are not told what their physical condition is. Instead I make a report to the C.O., and men are then placed on duties which they can easily perform. In this way the voluntary nature of the Home Guard is kept up, and so far as is humanly possible no man is called on to do work of which he is incapable.

The Director-General, Home Guard, said that he would try to make an honorary M.O. an integral part of every Home Guard battalion in the country after he had heard and seen what we have done. I hope that this answers Dr. Bull satisfactorily.—I am, etc.,

Dobeross, Jan. 17. E. WYNNE-JONES.

Adie's Syndrome

SIR,—I thought that the above term for the phenomenon in question had been accepted in both Great Britain and other countries for the sake of convenience and to avoid further wrangling on the question of priority. However, Mr. R. Foster Moore's letter (January 18, p. 99) shows me that *this is not so, and therefore I write to claim priority for my* colleague Dr. Charles Markus. What is called "Adie's syndrome" is the association of "myotonic pupil" (generally unilateral) with (apparently idiopathic) absence of tendon reflexes—absence of patellar or ankle reflexes or both. There is a tendency to regard a myotonic pupil without loss of tendon reflexes as an incomplete form of Adie's syndrome. It has even been suggested that some cases of apparently idiopathic absence of tendon reflexes, without pupillary changes, are also to be regarded as examples of incomplete Adie's syndrome.

Dr. C. Markus in October, 1905, demonstrated a boy aged 12 years (*Ophthalm. Society's Transactions,* 1906, **26**, 50) with typical right "myotonic pupil" and absence of patellar and ankle reflexes. "Myotonic pupil" had been described in Germany as early as 1902, but Markus laid particular stress on its association in this boy with absent tendon reflexes, and he even took the trouble to get me to confirm the latter phenomenon before demonstrating the case, which was in fact the first demonstrated example of what is now called Adie's syndrome. Markus at the same time suggested a pathological explanation —namely, that the change might be a local "abiotrophy" in Sir William Gowers's sense, and this explanation has not been proved incorrect. Moreover, twenty-seven and a half years later I showed the same patient for Dr. Markus at the Royal Society of Medicine (*Proceedings,* 1933, **26**, 530); the pupillary and tendon-reflex phenomena were still present as before, the patient having continued to enjoy good health; he was married and had two healthy children, and his blood serum gave negative Wassermann and Meinicke reactions. This case, therefore, confirms the benign nature of Adie's syndrome. A typical case of myotonic pupil, likewise described by Dr. Markus in 1905, was that of an old friend of mine. He is now in his seventy-sixth year and his myotonic pupil remains unchanged.—I am, etc.,

London, W.1, Jan. 18. F. PARKES WEBER.

Cut Tendons

SIR,—The interesting letters, especially the thoughtful letter of Dr. James Mennell (December 14, p. 848), prompt me to make a few remarks on this subject. I must at once say that I speak as an onlooker, not as a general surgeon. The importance of the subject must be my excuse for this letter.

When flexor tendons in the hand are cut most people give a bad prognosis for complete recovery. The out-patient sister will tell you she has rarely seen a case get perfect flexion; the matron at the nursing home and the massage sister will tell you the same; even the surgeon will warn you that adhesions are likely to form and that movement may not be complete. Mr. A. Wilfred Adams (November 30, p. 765) suggests that accurate suturing of the cut ends is the key to success. This, of course, is of the utmost importance. No doubt fine sutures and fine needles are required as well as a delicate surgical touch. How nicely an ophthalmic surgeon would do this job!

But this is only one aspect of the problem. First of all asepsis is of the utmost importance. We must expect adhesions if a septic infection of the tendon sheath occurs. Here I would suggest that the hand should be washed in running water for a quarter of an hour, and then soaked in biniodide solution 1 in 1,000, or proflavine solution 1 in 1,000, for a further fifteen minutes. Proflavine sulphate 0.1 buffered to *p*H 6.3 in distilled water has been shown by Drs. Russell and Falconer to have the minimum toxicity to tissues, while its bactericidal properties are equal to the other acriflavine preparations. It was described by Dr. Garrod in a recent discussion at the Royal Society of Medicine as the "ideal antiseptic."

Now for the problem of the tendon. This may be compared to a train running in a tube—a train which is in contact not only on the ground but also on the sides and on the roof, and separated from its walls by a lubricating fluid. The train slides to and fro in this tube. When a tendon is cut, our tube and train are cut in two. Now how are we going to join up our train without damaging the tube in which it runs? Let us take the case of a cut flexor profundus tendon. In seeking for the proximal end of the tendon, which has contracted up a couple of inches, it is customary to slit up the tendon sheath until the tendon is found; bandaging the forearm and flexing the hand will help to reduce the gap. In the case of our train, slitting up the sheath would mean cutting away the roof and most of the sides of our tube, thus collapsing the superficial structures on to our train. No matter how carefully the carriages are united together, our train would never again run smoothly to and fro. Dense adhesions must form on the roof and sides of a tendon thus exposed. The sheath is extremely thin and almost impossible to identify after it is slit up. Sewing up of the sheath over the tendon seems to be impossible, although so desirable.

Is there any way of preserving our tunnel while we look for our train? The following suggestion is purely theoretical on my part. It is that the tissues over the proximal end of the tendon should be carefully dissected down to, but not into, the sheath. Then a longitudinal slit about a centimetre long should be made about two inches from the cut end of the sheath. If the tendon can now be identified through the slit a very fine bougie can be passed through the slit up to the cut end of the sheath. Once the mouth of the sheath is identified a fine crocodile forceps could be passed up the sheath, and the cut end of the tendon drawn down. The tendon ends can then be accurately joined up with fine sutures all round their periphery and the tissues replaced.

Here the damage to our tunnel is only the cut in the roof and the slit further up. Any adhesions at these two points would not be serious and would yield to passive movement. With the usual surgical technique of slitting up the tendon sheath the outlook for good flexion of the terminal joint must be poor, no matter how early and skilfully passive movements are applied. One may ask if it is fair to leave these operations, the success of which is of so great importance to the individual, to newly qualified house-surgeons. Surely they merit the skill of the R.S.O. or one of the surgical staff, and should be treated as major operations.—I am, etc.,

Guildford, Jan. 17. T. B. JOBSON.

Too Old for Service

SIR,—The medical profession should take a definite stand upon the question of medical fitness for service. At present at one end of the scale there is flexibility, at the other end rigidity. A man of 21, for example, is assumed to be fit to be called up for service for his country's needs. If, however, he claims that he is medically unfit, then the medical examination and the medical decision is final as to fixing his place in his country's defence. A man of 70, on the other hand, is automatically disqualified for age only; the assumption is that owing to his age he is unfit and he is not allowed to disprove the assumption. A man of 21 is assumed to be fit, but he is allowed to bring evidence to prove his unfitness on medical grounds. Surely it is equally scientific for a man of 70 to submit to medical examination, and to prove thereby that he has the constitution, physical and mental, of the average man of 40 or 50. I know the economic objections that are usually raised, but they are comparatively unimportant in the face of the great principle that in the time of the country's need every man should be assessable at his scientific value and not at his age mintage.—I am, etc.,

London, W.1, Jan. 14. JOSIAH OLDFIELD.

Medical War Relief Fund

SIR,—I should like to pay a tribute of grateful thanks to the Medical War Relief Fund. As a result of enemy action my property was very severely smashed up. The committee of the fund came to my relief with a courtesy and speed which astonished me. I received a substantial loan (interest-free), which has made all the difference between a very hard knock and a crushing blow. I feel that my colleagues have come to my rescue in a noble manner, and I am proud of our profession, which has been able so quickly to raise a fund for the relief of its less fortunate members.—I am, etc.,

Jan. 19. A VICTIM OF THE BLITZ.

Obituary

CHARLES THURSTAN HOLLAND, F.R.C.S.

We regret to record the death on January 16, at the age of 77, of Mr. C. T. Holland of Liverpool, recently lecturer on radiology at the Liverpool University. Mr Holland was one of the pioneers in his specialty, and did more than any other man to further radiology and establish it as a department of medicine that could take its place on an equal footing with other special branches.

Charles Thurstan Holland, the son of the late Alderman W. T. Holland, was born at Bridgwater, Somerset. He was educated privately and at University College Hospital, qualifying M.R.C.S., L.R.C.P. in 1888. He took the Ch.M. Liverp. in 1922, became F.R.C.S. in 1928, and was made LL.D.Liverp. in 1935. After qualification he went into general practice in Liverpool and soon after Rontgen made his discovery in 1895 Holland quickly saw the possibility of applying x rays to medical and surgical problems. His enterprise and early work were quickly recognized, and he was appointed honorary radiologist to the Royal Southern Hospital, Liverpool, in 1896, where he worked in this capacity until 1904. From then until 1923 he was honorary radiologist to the Royal Infirmary at Liverpool. During the war of 1914–18 he was radiologist to the First Western General Hospital and consultant radiologist to the Western Command, holding the rank of major, R.A.M.C.(T.). In 1918 he was a member of the War Office Committee on Radiology.



Thurstan Holland was in the true sense of the word a pioneer. After he left general practice he worked in very close association with Sir Robert Jones, and this association played a great part in his success in developing and applying the new technique in his professional work. Not only did he have the vision to see the vast possibilities opened up by Röntgen's discovery, but he also had the strength of mind and forcefulness of character needed to overcome obstacles that are inevitably put in the path of the pioneer. He never hesitated to speak his mind, and his straightforward approach to problems always cleared the path in meetings and discussions when indecision seemed to prevail. As a chairman he was masterly and did not allow members of a committee to stray far from the point at issue.

So much of his time and energy were taken up by clearing the ground for the recognition of the new specialty that he was able to make few fundamental contributions to the new science. He will always be remembered as a pioneer, and as such was widely recognized in the numerous official positions he was asked to hold. The honour he most valued was his election in 1925 as president of the first International Congress of Radiology, which was held in London. He was president of the Röntgen Society in 1904 and 1916, president of the Section of Radiology at the Congress of Radiology and Physiotherapy in London in 1922, and president of the British Institute of Radiology in 1929. He was a member of the British Medical Association for fifty-four years, and was vice-president of the Section of Radiology and Medical Electricity at the Annual Meeting in 1910; president of the Section of Electrotherapeutics at the Liverpool Meeting in 1912; and vice-president of the Section of Radiology in 1932. He had a high reputation in the U.S.A. and was made an Honorary Fellow of the American College of Radiology; he deeply regretted that poor health did not allow him to be present at the fifth International Congress of Radiology, which was held in Chicago in 1937.

He published numerous papers on radiology in the medical press and was for a time a regular contributor to the *Medical Annual*. His energy and interest carried him into fields other than medicine, and he lectured on climbing and photography, being the first president of the Lancashire and Cheshire Photographers' Society. He was also Deputy Lieutenant for Lancashire. His wife died in 1924, and there was one son of the marriage.

[The photograph reproduced is by Elliott and Fry, Ltd.]

H. E. BOWER, M.D.

Dr. Harry Edward Bower, who died at his home, Viewfield, Stretton, Cheshire, on December 31, aged 74, studied medicine at Edinburgh University, qualifying M.B., C.M. there in 1887. He took his M.D. in 1905. After six years as assistant to his cousin in Weaverham he settled in Stretton, where he spent forty-eight years in family practice. He had been a member of the British Medical Association for fifty years.

Dr. L. J. PICTON writes: "Old Smith" was a character, shrewd, of disconcerting plain speech, a game shot, an archer, above all a doctor. He was generous to the many poor, to whom he never sent a bill, but, almost Robin-Hood-like, he made the very rich pay the full value of his undoubted services. Harry Bower, his roots in the soil, his formative years spent in "the Athens of the North," and his apprenticeship (in all but name) under the ripe, practical wisdom of his much older cousin, was the product of those influences on a character drawn into medicine by an interest which remained to the end unflagging. Keen but mild, with a mastery of detail which did not distract him from essentials, with a constant habit of picturing in his mind how the patient before him had come to be what he was, naturally urbane, a happy talker, appreciative of kindness, a worshipper of children, Bower was a family doctor, endowed for his task. Therapeutics was almost his hobby, and the new as familiar as the old. One innovation appalled him—the obligation to write panel "scripts." He would rather make the medicine than write it. For over a quarter of a century Bower served on the county panel committee. His balanced judgment reposed on experience begun as demonstrator of anatomy at Edinburgh University and as house-physician and house-surgeon at the Edinburgh Royal Infirmary and continued in a full range of the ordinary preoccupations of a country doctor—not least important in his eyes being his position as medical officer of the Runcorn Union. He was medical superintendent of the Isolation Hospital, Dutton, certifying factory surgeon, an honorary life member of the B.R.C.S., a J.P. for the county of Cheshire, and, during the last war, medical officer of the Oaklands Military Hospital, Daresbury, and the Raddon Court Military Hospital. At the time of his death he was a county councillor, representing the Appleton Division; he had served an earlier term in this capacity. He was a governor of the Boteler Grammar School. A Freemason, he was a member of the North Cheshire Lodge. In 1899 he married the daughter of C. T. Whitley, J.P., of Stretton, who survives him with two sons and three daughters. His eldest son, who succeeds him in practice, is now on active service.

H. C. WILSON, M.D., F.R.C.S.

We regret to record the recent death from coronary thrombosis of Dr. Hugh Cameron Wilson. He was born in Edinburgh in 1883, and was educated at George Watson's College; on leaving school he began his medical career at the University of Edinburgh. Wilson was a brilliant student, graduated with honours in 1906, and took his M.D. with a highly commended thesis two years later. He held resident appointments at the Royal Infirmary of Edinburgh for a year, and then took a single ticket to London. He was house-surgeon at the Seamen's Hospital, Greenwich, Paddington Children's Hospital, and resident surgical officer at the Great Northern Hospital. He took the F.R.C.S. in 1911 and intended specializing in surgery. The opportunity arising, he joined Dr. E. C. Montgomery in practice in Maidenhead in 1912, and in 1914 he introduced his boyhood friend, Dr. E. R. D. Maconochie, into the practice. He was soon appointed surgeon to the Maidenhead Hospital, and until his death was mainly responsible for the surgical work of the district. During the 1914–18 war he was a major in the R.A.M.C., acting as surgical divisional officer in a hospital in France.

During the past twenty-two years his skill as a surgeon has been in great demand. He was a brilliant surgeon, quick, neat, and accurate. He was a very popular and hard-working man, loved by rich and poor alike, and the humblest was treated by him in a kindly and courteous manner. His hobbies were occasional golf, fly fishing—in which he was something of an expert—and the local hospital. He was E.M.S. medical superintendent of the hospital, as well as surgeon, and took a great interest in its affairs and management, apart from his interest as a surgeon. The hospital will miss the jaunty air, quick step, and red carnation in his buttonhole, and his like will be hard to replace. He was of a somewhat retiring disposition apart from his medical world, and he took no part in public affairs. He was a true friend to many. He is survived by his widow and one daughter.

T. LAWSON McEWAN, M.B., CH.B., D.P.H.

By the death of Thomas Lawson McEwan on January 13 at the age of 48 his colleagues have lost a staunch friend and Devon its first county bacteriologist.

Dr. McEwan was educated at the Harris Academy, Dundee, and at the University of St. Andrews, where he graduated B.Sc. in 1914, with honours in chemistry, mathematics, and physics. He then went to London and continued the study of chemistry and biology at King's College, University College, and Birkbeck College. Later he became principal assistant to the public analyst for the City of Westminster and for the borough of Fulham. He was given a commission in the Argyll and Sutherland Highlanders, but was transferred in December, 1916, to the Ministry of Munitions as a research chemist. In the following year he went to the Research Department at Woolwich Arsenal. His research work there was published in the *Journal of the Society of Chemical Industry*, and he was elected F.I.C.

Wishing to take up medico-scientific work, a project which had been interrupted by the war, McEwan returned to St. Andrews to study medicine, where he was an outstanding student, and in June, 1928, graduated M.B., Ch.B. with special distinction, gaining the McEwan prize in surgery. After being house-physician at Dundee Royal Infirmary he became assistant to Prof. W. J. Tulloch, who wrote of him: "As a student of bacteriology he showed himself to be a man of outstanding ability. He was easily the best student of his year in my subject, and, indeed, was the best student of his year in the majority of the subjects in the medical curriculum. He gained the medal in the class of bacteriology, his marks being among the highest that had been recorded in the examination. Subsequently he also distinguished himself in the class of bacteriology for the D.P.H." In 1930 McEwan was appointed bacteriologist to the Devon County Council, a post he held up to the time of his death. This new department he organized with great skill and enthusiasm, and gradually built up a laboratory on first-class lines.

The indomitable courage with which he bore his long and fatal illness was what those who knew him well would have expected of him, but his death leaves a sad gap, and he did not live to see the fulfilment of his cherished and carefully laid plans of a new laboratory, upon which he had spent so much thought and time. In 1919 he married Elizabeth Holt Ogilvy, who survives him with their two daughters.

R. B. F. McKAIL, M.B., CH.B., D.P.M.

Dr. R. B. F. McKail, who died on January 10 after a long and distressing illness which he bore with great courage, was educated at Allen Glen's School, and in 1909 graduated M.B., Ch.B., with commendation, at the University of Glasgow. In his student days he won the Arnott Prize and the Black Medal and Muirhead Prize. After qualifying he worked for two years as demonstrator in the Anatomy Department in his own university. In 1911 he entered the service of the Lancashire Mental Hospitals Board at the County Mental Hospital, Prestwich, and later served under the same authority at their hospitals at Winwick and Whittingham. In the war of 1914–18 he served with the rank of captain in the R.A.M.C. in Gallipoli, Egypt, Sinai, and Palestine. He was twice mentioned in dispatches, but his health was affected, and from this ill-health he never fully recovered. On demobilization in 1920 he was appointed deputy medical superintendent at the Calderstones Certified Institution for Mental Defectives—once again under the Lancashire Mental Hospitals Board—and in 1933 became the first medical superintendent of the Brockhall Certified Institution, Langho, near Blackburn. In September, 1937, continued ill-health compelled him to retire, and he returned to his native city of Glasgow. Dr. McKail was for many years a member of the British Medical Association and the Royal Medico-Psychological Association. His wife predeceased him in 1937.

Dr. DOUGLAS J. ROSE, medical superintendent of Brockhall Institution, writes:

Having myself spent twelve years as one of McKail's junior colleagues I should like to add my personal appreciation of his remarkable ability and great personal charm. Throughout his career he was exceptionally popular among his professional colleagues, his patients, and the staffs of the institutions at which he served. Often in indifferent health, he never spared himself, but devoted himself whole-heartedly to the interests of his patients. No junior colleague ever sought his help or advice in vain. With a broad general culture and unfailing interest in men and affairs he combined a wide experience and acute clinical judgment in his own specialty. A keen follower of sport and athletics, his varied interests made him a most acceptable social companion to all sorts and conditions of men. During the last few years of his active professional life his knowledge, energy, and mastery of detail were devoted mainly to the preparation of the Brockhall Extensions Scheme, but rapidly failing health prevented him from seeing the fruits of his labours. The institution, now almost completed, will, however, stand as a tribute to his wisdom and foresight.

It is with regret that we record the death at Ross-on-Wye on January 4 of Dr. ALFRED HUMPHREY-DAVY of Bournemouth. A Galway man, Humphrey-Davy first studied engineering at the Queen's College, Galway, obtaining the B.E. degree. Directly afterwards he started to study medicine, and graduated M.D. and M.Ch. in the Queen's University in 1870. For a time he was a medical officer at Hoxton House Asylum, and later, from 1879 to 1894, he was in general practice in the Sheffield area. He moved to Bournemouth in the latter year, where he built up a considerable practice. During the last war he acted as physician to the Herbert-Home Belgian Hospital in Bournemouth. He was honorary physician to the Victoria Cripples Institution, Bournemouth, until 1929, in which year he retired from practice. The late Prof. A. Carter of Birmingham told the writer of this notice that his father once asked Sir William Jenner what he considered the essential ingredients in a physician's character. The reply was he must be "kind, honest, and dogmatic!" Certainly Dr. Humphrey-Davy had all these qualities in full measure. He was a very devoted member of the British Medical Association and was a past chairman of the Bournemouth Division and past president of the Bournemouth Medical Society. While a student at Galway he was stroke for three years of the winning team in the college boat races and was presented with a gold medal. He died a widower, leaving a son and daughter to mourn a very beloved father.—W. J. S.

AWARDS FOR GALLANTRY IN CIVIL DEFENCE

A *Supplement* to the *London Gazette* dated January 17 contains a list of awards for gallant conduct in air raids and includes the names of three medical men who have been awarded the George Medal and five others who have received commendations for brave conduct in civil defence. Dr. André Bathfield (Royal Chest Hospital, London), Dr. Henry Norman Gregg (Coventry), and Dr. Robert Lindsay (Folkestone) receive the George Medal, and Dr. Roy McGregor Barron (Eastbourne), Dr. John Fenton (Eastbourne), Dr. Alistair William MacQuarrie (Brightlingsea), Dr. Laurence Alfred Howard Snowball (Eastbourne), and Dr. Charles Keith Vartan (Hither Green) receive commendations. The official description of the gallant conduct of the George Medallists is as follows:

Dr. ANDRÉ BATHFIELD: "Dr. Bathfield, although badly cut in many places about the face and neck and bleeding profusely, assisted in the rescue, treatment, and dressing of patients and staff, and did not leave the hospital for the treatment of his own wounds until every injured person had been removed. He worked untiringly for the patients and nurses."

Dr. HENRY NORMAN GREGG: "When the City of Coventry was heavily bombed by enemy aircraft Dr. Gregg showed a high degree of courage and resource which contributed to the saving of a number of lives. While fires were raging and bombs falling, he coolly continued to go, partly on foot and partly by bicycle, from one incident to another administering morphine to those trapped in the wreckage, and applying first aid under conditions of extreme difficulty, with complete disregard for the intense bombardment and for the very real personal danger entailed."

Dr. ROBERT LINDSAY: "Two children were trapped under the debris of some houses demolished as a result of enemy action. At great personal risk to himself, Dr. Lindsay crawled through a gap in the debris and sawed through fallen woodwork so that the children might be rescued. His danger was increased by escaping gas. At another house, which was completely demolished, Dr. Lindsay crawled through a hole made in the debris to the aid of a trapped boy, cleared the boy's face of earth and rubble, administered morphine to him, and directed the operations of the rescue party. The boy was eventually released. Dr. Lindsay acted at considerable risk to himself and it was mainly due to him that the children were rescued alive."

Medico-Legal

THE MONEY VALUE OF LIFE

Before the Law Reform Act, 1934, a ground of personal action died with the person. If a man was killed in a motor accident his widow had no claim against the other party to the collision except as a dependant under the Fatal Accidents Act. By the 1934 Act the deceased man's estate was given the same rights of action as he had at the moment of his death, and by the decision of the House of Lords in Rose v. Ford the estate was held to have a claim for the man's loss of expectation of life. In the subsequent years the courts have wrestled with the problem of fixing the appropriate damages for the loss of expectation of life to persons dying at various ages and in various circumstances. At the root of the problem there always lies, of course, the absurdity of compensating a survivor for a wholly fictional wrong supposed to have been suffered by the deceased. A recent decision by the House of Lords[1] has clarified the position to some extent, while introducing some new and remarkable considerations. Viscount Simon, Lord Chancellor, declared that the right conclusion is not to be reached by applying a statistical or actuarial test. The thing to be valued is not the prospect of lengthened days, but the prospect of a predominantly happy life. In extreme old age the brevity of the expectation of life may be relevant, but in general it is of no assistance to know how many years may have been lost unless one also knows how to put a value on the years. The ups and downs of life, its pains and sorrows as well as its joys and pleasures, have to be allowed for in the estimate. Such a problem, Lord Simon suggested, might seem more suitable for discussion in an essay on Aristotelian ethics than in a court of law. Before damages are awarded under this head the court must be satisfied that the circumstances of the individual life were calculated to lead, on balance, to a positive measure of happiness, of which the victim has been deprived by the defendant's negligence. If the character or habit of the deceased were calculated to lead him to a future of unhappiness or despondency, that would be a circumstance justifying a smaller award. As Lord Wright said in Rose v. Ford, special cases suggest themselves where the termination of a life of constant pain and suffering cannot be regarded as inflicting injury, or at any rate the same injury as in more normal cases. Moreover, the question is not whether the deceased had the capacity or ability to appreciate that his further life on earth would bring him happiness. The test is not subjective. The right sum to award depends on an objective estimate of the kind of future the victim might have enjoyed. Pecuniary prospects do not come into the picture.

When the deceased is very young, there is necessarily so much uncertainty about his future that no confident estimate of prospective happiness can be made. If the deceased, on the other hand, is old enough to have settled prospects, and to have attained in some degree to an established character and to firmer hopes, his future becomes more definite and the extent to which good fortune may probably attend him more calculable. In no case, however, should the social position or prospects of worldly possession be considered. Lawyers and judges may here, Lord Simon observed with satisfaction, join hands with moralists and philosophers and declare that the degree of happiness to be attained by a human being does not depend on status.

His Lordship admitted that the jury or judge of fact is attempting to equate incommensurables. Damages which would be proper for a disabling injury may well be much greater than for deprivation of life. For these reasons, whatever the age of the deceased, very moderate damages should be awarded. In the case before their Lordships the deceased was a boy of 2½ years and the trial judge had awarded £1,200. The Court of Appeal had reduced this to £350. The House (which, because of the importance of the case, consisted of seven Law Lords) reduced this further to £200. They hoped

[1] 1937, A.C., 826.
[2] Benham v. Gambling, 1941, 1 All E.R. 7.

that the views expressed in the Lord Chancellor's judgment might help to set a lower standard of measurement for what is in fact incapable of being accurately measured in coin of the realm.

In future, therefore, when a court is asked to assess damages for loss of expectation of life, it will be open to the parties—and indeed necessary—to lead evidence to show the prospect of future happiness which the deceased had at the moment of his death. The scope of such evidence seems to be almost without limit, and to include all kinds of intimate personal, and indeed psychological, details about the deceased. Whereas the personal representatives may endeavour to show that the deceased was virtuous, hardworking, and a good husband and father, the negligent motorist may be able, by patient investigation, to show that he was a secret drinker or gambler, or kept a second establishment under another name. His intimate friends may be subpoenaed and cross-examined for information about his attitude to life; if he was ever under psychological treatment, the psychologist may be required to give a complete account of his analysis. Moreover, happiness as a basis for the value of human life seems difficult to justify either on philosophical or moral grounds. Their Lordships have given a new direction to the decision of expectation of life cases, but can hardly be said to have made that decision any easier.

Medical Notes in Parliament

The House of Commons reassembled on January 21.

On January 21 Sir ERNEST GRAHAM-LITTLE asked the Lord Privy Seal in what form questions on the advisability of adding synthetic vitamin B_1 to the war loaf were put to the Bragg Committee, whose formation was announced on June 4, 1940; whether the committee, before making its recommendations, was informed of the agreement with Roche Products, Limited; if he would now publish the Bragg Report or lay it on the Table of the House, or give reasons for not doing so; how many meetings this committee had held; when was the last; and whether it was still in existence or had been superseded by other advisory committees whose formation had been announced since the Minister's speech on July 18.

Mr. ATTLEE said that the report of the Scientific Food Committee on Bread was submitted on their own initiative. He understood that the committee was aware of the only agreement with Roche Products, Limited, then existing—namely, an agreement between that company and another company. He saw no reason in the circumstances to make a departure from the normal rule whereby reports of this nature were not published. The committee was still in existence and held regular meetings, and he deprecated giving the very detailed information asked for.

On January 21 Sir HENRY MORRIS-JONES asked the Minister of Health whether he had any statement to make concerning the admission to the *Medical Register* of alien allied doctors to assist us in the present emergency.

Mr. MACDONALD said that the Home Secretary, the Secretary of State for Scotland, and he had made an Order providing for the registration of these doctors under certain conditions.

On January 21 Dr. MORGAN asked the Secretary of State for War whether he was aware that there was grave disquiet among medical practitioners at the fact that many officers of the Royal Army Medical Corps were engaged exclusively, or principally, on administrative and non-professional work; and whether he would cause the matter to be investigated and corrected, and so reduce the demands on civilian practitioners for service with the armed Forces.

Captain MARGESSON replied that he was not aware of any grave disquiet, but it was the fact that, as happened also in civil departments, many officers of the Royal Army Medical Corps were engaged exclusively on administrative work which could not be efficiently performed by laymen. There were certain appointments which had in the past been held by medical men, but could, by an adjustment of duties, be held by non-medical men. These were now being reviewed. Some medical officers had already been replaced, and the remainder would be replaced where possible.

Mr. MACDONALD told Mr. Benson on January 21 that supplies of an insecticide selected as a result of experiment had been issued to the local authorities of the areas in which people habitually slept in public shelters. The best protection against lice was cleanliness, and local authorities had been urged to ensure that their cleansing facilities were adequate to meet the additional needs of shelterers in their areas. Compulsory powers to delouse and cleanse the persons and effects of shelterers had been obtained, and other steps to prevent the spread of lice in shelters had been taken or were under consideration.

On January 21 Dr. MORGAN asked the Secretary of State for War, having regard to the recent announcement by the Central medical War Committee about volunteers for ordinary commissions in the Royal Army Medical Corps, how many doctors had volunteered up to November 30, 1940, and had not yet been called; why volunteers were required to communicate with their Local Medical War Committee when all that that committee was able to do was to transmit names to the central committee; and if he was aware that many doctors who volunteered months ago and were told to hold themselves available were still without definite information and, consequently, in a state of uncertainty as to their domestic and professional arrangements.

Mr. MACDONALD said he was unable to give the figures asked for in the first part of the question. Many doctors who, in answer to the questionary issued before the war, expressed their willingness to serve in the Forces could not see their way to do so when approached at a later date, but he was assured by the secretary to the Central Medical War Committee that of the doctors who had in recent months applied to be recommended for commissions in the Royal Army Medical Corps very few had not yet had their names submitted to the War Office, and that accordingly the situation referred to in the last part of the question should not in general arise. If Dr. Morgan had any cases in mind and would let him have particulars he would make inquiries. Reference to the Local Medical War Committee was usually necessary to verify that the volunteer could be recruited without serious prejudice to the medical services of the area.

On January 21 Sir ERNEST GRAHAM-LITTLE asked the Prime Minister whether his attention had been drawn to the formation, by the British Medical Association, of a medical planning commission to consider problems of reconstruction and reorganization in the field of medicine in the post-war era; and whether, in view of the complexity of these problems and the importance to the public as well as to the medical profession of such reorganization, he would consider the desirability of appointing a Royal Commission to conduct this inquiry with the ultimate purpose of appointing an independent Government commission to regulate this reorganization, in place of an individual and unofficial medical association, whose recommendations could not command the general assent which would be accorded to a Government inquiry.

Mr. CHURCHILL: I am aware of this inquiry by the British Medical Association, and of similar inquiries by other bodies interested in the medical and hospital field. They will no doubt afford a useful addition to the abundant material available, in the reports of commissions and elsewhere, when the opportunity of reconstruction comes. I do not think that the appointment of a Royal Commission would in present circumstances be opportune.

Mr. MACDONALD, replying on January 21 to Dr. Morgan, said that the executive responsibility for securing the provision of adequate medical and sanitary services in public shelters regularly used for sleeping had now been devolved on the Regional Commissioners. They had the assistance of their inspectors, both medical and sanitary. If in any particular area the Commissioner were to be dissatisfied with the progress made by the local authority it would be open to him to recommend that the authority be superseded. In the City of London and the metropolitan boroughs eight doctors were in whole-time attendance at shelters, 159 more were under contract to visit shelters each night, and a further 308 were on call. The terms of service for each of these three classes were set out in Circular No. 2190, and he was not aware that there was any general dissatisfaction among the doctors whose services had been obtained.

Universities and Colleges

UNIVERSITY OF OXFORD

B.M. and B.Ch. Examinations, 1941

It should have been made clear in the notice regarding the above examinations (January 11, p. 67) that, so far as the *second* B.M. is concerned, only an examination in *pathology* will be held in March and April; there will be no examinations in any other second B.M. subjects, though there will be a complete first B.M. examination.

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

M.D.—*Branch I (Medicine)*: Margaret D Baber, R S Lowe. *Branch II (Pathology)*: S D Elliott, H Spencer. *Branch IV (Midwifery and Diseases of Women)*: Mary Kane, K Fraser M Robinson, I. E. J. Thomas. *Branch V (Hygiene)*: K [illegible] M Hart.

M.S.—*Branch I (Surgery)*: A D Le Vay.

D.Sc.—P. A. I. Goret (Guy's Hospital Medical School), R W Haines (St. Thomas's Hospital Medical School).

PH.D.—*In the Faculty of Medicine (Non-clinical)*: H Kwiatkowski.

ROYAL CANCER HOSPITAL (FREE)

ACADEMIC POSTGRADUATE DIPLOMA IN MEDICAL RADIOLOGY—D. Andrew, H. F. Francis, J. J. Richmond.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

In England and Wales the four commonest infectious diseases in this country—diphtheria, scarlet fever, measles, and whooping-cough—declined in incidence slightly compared with the previous week, but in London there were notable increases in respect of all four. In Scotland the notifications for diphtheria and whooping-cough rose, especially of the former. The tardy rise in the incidence of infectious diseases in London is naturally ascribed to the effects of evacuation, but in view of the abnormally low incidence of these diseases in 1939 it is possible that the 1938 level may be exceeded before those that have remained have acquired immunity through attack. Notifications of acute poliomyelitis have risen slightly, and the figures for dysentery are nearly double those of the previous week.

Dysentery.—Although twenty-one administrative counties were affected, in only seven were more than 5 cases recorded—namely: Kent 36 (all in Tonbridge R.D.); London 23 (St. Marylebone 16, and 1 each in the boroughs of Camberwell, Finsbury, Hackney, Shoreditch, Wandsworth, Westminster, and Woolwich); Lancaster 18 (Preston R.D. 12, Whiston R.D. 3, Leigh M.B. 2, Manchester 1); Warwick 13, all in Birmingham; Surrey 11 (Reigate M.B. 8, and 1 each in Epsom and Ewell M.B., Coulsdon and Purley U.D., and Banstead U.D.); Leicester 9 (Market Bosworth R.D. 8, Leicester 1); Yorks, West Riding, 7 (Sheffield 4, Wakefield 2, Huddersfield 1). It is evident that, in relation to the numbers at risk, rural communities are affected much more heavily than urban centres, as is commonly observed when infection is conveyed through the alimentary tract. Although the figures for deaths are not available, the case fatality is probably low, as the mild Sonne form is the prevalent type at present.

Influenza.—A hint of the possible appearance of influenza in epidemic form is given by the rise in the pneumonia (primary and influenzal) figures, which exceed those of 1939 and 1938. From other countries reports have arrived of outbreaks of mild influenza in epidemic form among European countries: from Ireland, especially in the city of Cork; from Stockholm, where the disease is extremely contagious although mild; from Belgrade, where more than 60,000 cases have been recorded; and from the United States of America, notably in Memphis (45,000 cases). Boston (20,000 cases among school children), and in Western Virginia, where the epidemic is regarded as the worst since 1918.

No. 51 for 1940

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended December 21, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease are for (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1940 (a)	(b)	(c)	(d)	(e)	1939 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebro-spinal fever	133	11	32	1	3	26	—	6	—	—
Deaths		2	4				—	—		
Diphtheria	1,378	64	485	32	40	813	31	255	51	35
Deaths	33	2	11	3	1	17	1	9	3	1
Dysentery	152	23	17		—	33	12	43		—
Deaths			2	—	—			—	—	—
Encephalitis lethargica, acute	16	—	—		—	1	—	—		—
Deaths		—	—				—	—		
Enteric (typhoid and paratyphoid) fever	16	1	3	21	—	15	2	2	4	—
Deaths	1	—	—	1	—	1	1	—	—	—
Erysipelas		37	59	6	5			71	10	3
Deaths		—	—				—	—		
Infective enteritis or diarrhœa under 2 years										
Deaths	24	1	5	3	1	23	1	3	8	2
Measles	15,221	443	288*	2	51	1,772	11	14		89
Deaths	16	1	5	2	—	3	—	—	1	2
Ophthalmia neonatorum	50	1	12		1	59	4	16		1
Deaths										
Pneumonia, influenzal†	970	63	8	3	11	454	26	12	3	22
Deaths (from influenza)	30	6	4	2	1	27	4	9	1	1
Pneumonia, primary			248	11				165	5	
Deaths‡		63		10	10		5		22	8
Polio-encephalitis, acute	3	—				2	—			
Deaths		—					—			
Poliomyelitis, acute	13	—	3		—	4	—	—		—
Deaths		—	—				—	—		
Puerperal fever	2	2	10	4	—	4	4	8	3	—
Deaths		—					—			
Puerperal pyrexia	106	3	12		1	111	9	13		1
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,436	93	225	62	40	1,072	32	157	52	83
Deaths	3	1	—	—	—	2	1	—	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths		—	—	—	—		—	—	—	—
Typhus fever	—	—	—		—	—	—	—		—
Deaths			—	—	—			—	—	—
Whooping-cough	2,935	40	206		23	734	14	20		1
Deaths	16	—	5	2	—	1	—	—	—	—
Deaths (0-1 year)	317	23	74	24	22	341	25	63	30	8
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	5,944	889	690	196	134	5,280	802	651	196	153
Annual death rate (per 1,000 persons living)			14.0	13.1	11.7			13.8	13.2	13.4
Live births	4,547	267	815	236	174	4,919	611	829	232	183
Annual rate per 1,000 persons living			16.5	15.8	15.2			16.6	15.6	16.5
Stillbirths	204	14	32			260	36	45		
Rate per 1,000 total births (including stillborn)			38					51		

* Notification in certain administrative areas only.

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

‡ Since January 1, 1940, figures for London (b) have been for deaths from all forms of pneumonia; the corresponding figures for 1939 relate to deaths from lobar pneumonia only.

The Services

CASUALTIES IN THE MEDICAL SERVICES

ROYAL ARMY MEDICAL CORPS

Major GORDON ALAN MACDONA LINTOTT died on active service in December, 1940, while serving in Egypt. He received his medical education at Guy's Hospital and qualified M.R.C.S., L.R.C.P. in 1931, becoming M.R.C.P. in 1934. He also took the degrees of M.B., B.S. of the University of London in 1932 and proceeded M.D. in 1936. He had held the posts of medical registrar and tutor, demonstrator in physiology and pathology, and house-physician and out-patients' officer at Guy's Hospital, and before the war was clinical tutor at the hospital. He will be remembered for his critical examination and report on the routine of water divining carried out in the physiological department of the hospital. He mastered the technique of gastroscopy under Henning in Germany and subsequently visited many clinics in the United States of America, returning with much valuable fresh knowledge. On the outbreak of war, by which time he had established a reputation as a sound clinician and an able teacher, he remained at the hospital in the Emergency Medical Service as physician in charge of the medical unit, until he felt that he was still not putting out enough effort, when he joined the R.A.M.C. as major.

Medical News

Sir Walter Langdon-Brown will give a Chadwick Public Lecture entitled "Mental Health in Wartime" on Tuesday, February 4, at 2.30 p.m., at the Royal Society of Tropical Medicine and Hygiene, 26, Portland Place, W.1.

A conference on A.R.P. is to be held on February 2, from 10.30 a.m. to 4 p.m., at Islington Central Library, 68, Holloway Road, N.7. The conference is convened by the Association of Architects, Surveyors, and Technical Assistants, and by the National A.R.P. Co-ordinating Committee. Their aim is to bring together for discussion technicians who are qualified to solve the urgent problems of A.R.P., and administrative officers who are not satisfied with the present state of affairs. Shelters, the care of those bombed out, and medical problems are among the subjects scheduled for discussion and on which a free exchange of opinion will be encouraged. Drawings and models of various types of shelter will be on view.

It is learnt that vitamin C, given in sugar tablets, is to be distributed daily, free of cost, to all children between the ages of 10 and 14 who live in thickly populated districts of Germany or territories incorporated into the German Reich. The order is effective from February 1 to May 31 in all regions except where fruit and vegetables are plentiful. Vitamin C tablets have already been distributed on an experimental basis free throughout the Reich. The resistance to infection was found to increase, and between December 15, 1940, and March 31, 1941, the treatment was extended to newly born children with good results.

The *Scotsman* reports steady progress in the campaign to immunize children against diphtheria in Edinburgh. Up to January 17, being the end of the sixth week of the scheme arranged by the Public Health Department, contact had been made with 20,387 children, and of these 15,438 had received the two inoculations necessary to complete immunization. Of the completed immunizations, 1,983 were given at child welfare centres, 2,800 at schools, and 7,933 at first-aid posts throughout the city. The number of immunizations carried out by private medical practitioners up to the same date was 2,722, and fresh batches of certificates are reaching the medical officer of health from this source every day.

Even if the evacuation of children is causing some unexpected psychological problems, it is at least satisfactory to note that the children in a much more dangerous and difficult position are being given sympathetic consideration by the authorities. Mrs. Creswick Atkinson, a member of Lord Horder's Committee, a well-known broadcaster on child welfare and a former British Red Cross worker, has been moved from her post as technical adviser to the Women's Voluntary Services in order that she may take up a full-time paid appointment as organizer of welfare work for women and children who use the large air-raid shelters of London. Mrs. Atkinson will advise local authorities on the organization of welfare work in those shelters holding 500 or more people. She will work in collaboration with Mr. Charles Key, M.P., London Regional Commissioner for Shelters. Mr. Key states that, while dispersal remains the policy of the Government, and while one of the new organization's tasks will be to persuade mothers to evacuate their children, it must be expected that the large shelters will still be much used. Of the 81,000 children still in London, 60% have not attended school since last July and are badly in need of the care and guidance which the new body of welfare workers will provide.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Premenstrual Mammary Swelling

Dr. ROSAMOND BISCHOFF (Luton) writes: I should like to know if any of your readers could tell me how to treat patients who suffer from swollen, painful breasts before menstruation. I have one patient who has considerable pain and slight swelling for two weeks before each period. Menses are regular and of moderate amount. She has been married six years but has no children. Examinations of breasts and pelvis are negative. Other patients have this complaint in a lesser degree and for a shorter period. My cases are all in nulliparae with normal menstrual history and negative examination. Would any form of hormone therapy be advisable?

Income Tax

Reduction in Net Earnings

"R. H." was mobilized in September, 1939, and has since employed an assistant. His aggregate income as assessed for the year to April 5, 1940, was not sufficiently in excess of his aggregate earned income for that year to justify a claim for relief. How does he stand for 1940–1?

*** Presumably the profits of the practice will have fallen still further for 1940 owing to the fact that an assistant will have been paid for the whole of that year. It may therefore be that the difference between aggregate income as assessed (taking the practice profits at the 1939 figure) and the aggregate actual earned income for the year to April 5, 1941, will satisfy the 20% condition and relief will be due. (N.B.—In calculating the actual income from the practice "R. H." can if he prefers compute it for the year to April 5, 1940, as 3/4 of the 1939 profits plus 1/4 of the 1940 profits, and it may be worth reviewing the position for that year now that the 1940 figures are available.)

LETTERS, NOTES, ETC.

Diphtheria Incidence: A Small-pox Analogy

Dr. ROBERT ANDERSON (Birmingham) writes: Dr. R. M. Courtauld (January 18, p. 106) may find the explanation he wants in Glasgow's experience of small-pox epidemics in 1900 and 1901. In 1900 there were about 2,000 cases of small-pox and over 400,000 people were revaccinated—about half the population. In 1901 there was another epidemic of about 500 cases. Not one of the 400,000 revaccinated people contracted the disease. This was an experiment in immunization on a large scale.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY JANUARY 25 1940

TEMPORARY REGISTRATION AND EMPLOYMENT OF FOREIGN AND OTHER OVERSEA MEDICAL PRACTITIONERS

Reference was made in the *British Medical Journal* last week to the *Medical Register* (Temporary Registration) Order, 1941. There is given below a fuller account of this Order and an explanation of the procedure to be followed by foreign and other oversea medical practitioners seeking employment and by hospitals wishing to secure their services.

The general effect of the Order is to empower the General Medical Council to register temporarily in the Colonial List or in the Foreign List of the *Medical Register* certain foreign and other oversea practitioners who have been selected for medical commissions in the Armed Forces of the Crown or in an Allied or Associated Force, or for employment as medical officers in certain hospitals, institutions, or services (not involving medical attendance on patients in their own homes).

APPROVED HOSPITALS AND SERVICES

The hospitals and services which are approved for the purpose of the Order are as follows: (*a*) hospitals provided by local authorities or by combinations of local authorities; (*b*) other hospitals included in the Emergency Hospital Scheme (including what are known as "suspended" hospitals but not those which have been withdrawn, temporarily or otherwise, from the Scheme); (*c*) service at or in connexion with any first-aid post provided by a scheme-making authority under the Civil Defence Acts.

The Minister (i.e., the Minister of Health in relation to England and Wales, the Secretary of State for Scotland in relation to Scotland, and the Home Secretary for Northern Ireland in relation to Northern Ireland) will be prepared to consider applications for approval of any further hospital, institution, or service under the Order.

DEFINITION OF "HOSPITAL"

The term "hospital" is defined in the Order as including:

(*a*) Any sanatorium, convalescent home, or public assistance institution.

(*b*) Any institution within the meaning of the Mental Treatment Act, 1930, or institution, certified house, or approved home within the meaning of the Mental Deficiency Act, 1923, or any institution within the meaning of the Lunacy (Scotland) Acts, 1857 to 1919, or certified institution, certified house, or approved home within the meaning of the Mental Deficiency and Lunacy (Scotland) Act, 1913, or any public mental hospital or registered institution within the meaning of the Mental Treatment Acts (Northern Ireland), 1932.

(*c*) Any clinic, dispensary, hospital centre, or out-patient department.

PRACTITIONERS COVERED BY THE ORDER

Effective applications for temporary registration under the Order can be made only by practitioners who are by law entitled to practise in one of the following countries or in any of the oversea territories or possessions of one of these countries: (*a*) The British Dominions, Colonies, Protectorates, and Mandated Territories; (*b*) Belgium, Czecho-Slovakia, France, Greece, Holland, Norway, and Poland; (*c*) Germany and Italy.

Registration is subject to the conditions that the applicant is of good character, that he has been selected for one of the forms of employment defined in the Order (see above), and (in the case of a practitioner selected for civilian employment) that he holds a medical diploma or diplomas recognized by the General Medical Council for the purposes of the Order as furnishing a sufficient guarantee of the possession of the requisite professional knowledge and skill.

PROCEDURE TO BE FOLLOWED BY HOSPITALS

A hospital or service requiring the services of a practitioner should apply in all cases to the Secretary of the Central Medical War Committee at B.M.A. House, Tavistock Square, W.C.1. The Committee is compiling a list of practitioners available for civilian medical employment under the Order, and will supply names, with particulars of nationality, age, qualifications, and experience, in response to requests from approved hospitals and services. Having selected a practitioner for the vacant appointment, the hospital should notify the Central Medical War Committee, which in turn will notify the General Medical Council. The practitioner's application for registration will then be sent by the Committee to the hospital for completion, and when all the necessary formalities have been complied with the hospital will be informed by the committee that registration has been effected.

PROCEDURE TO BE FOLLOWED BY PRACTITIONERS

An oversea practitioner seeking registration and *civilian* medical employment under the Order must first apply to the Central Medical War Committee for inclusion of his name in the list of available practitioners. Interviews cannot be granted and *application must be made in writing*. When notifying him that his name has been included in the list the Committee will send the practitioner (1) a form on which he will be asked to supply particulars of his qualifications, experience, etc.; (2) a form of application for registration; and, in the case of a foreign practitioner, (3) a form of application for an Aliens War Service Department permit. The practitioner, having completed these forms, will return them to the Central Medical War Committee: and when the practitioner has been selected for an appointment the Committee will immediately commmunicate with the appropriate authorities in order that all the necessary formalities may be completed without delay. In the case of a foreign practitioner the Committee will inform the General Medical Council when the Aliens Department of the Home Office, in consultation with the Aliens War Service Department, has given notification that it raises no objection to the practitioner's name being placed on the *Medical Register* with a view to employment covered by the Order: and when employment has been offered and registration has been effected the Committee will notify the Aliens Department, and the practitioner will be asked to send his Police Registration Certificate to that Department for endorsement.

The Order does not affect the operation of the Aliens Acts and Orders or the Minister's circulars governing the employment of aliens of enemy nationality in emergency hospitals. The registration of a practitioner who has been selected for approved civilian medical work will not, for example, exempt him from the restriction imposed on him as an alien in regard to entering a protected area.

PRACTITIONERS ALREADY REGISTERED

There are a number of practitioners who are by law entitled to practise in one of the territories specified in the Order, but who have not hitherto been able to obtain work in this country despite the fact that their names already appear in the *Medical Register*. Such practitioners, if they wish to obtain civilian medical work of the kind approved for the purpose of the Order, should make application in the way indicated above, but it will, of course, be unnecessary in these cases for any application to be made to the General Medical Council.

MEDICAL COMMISSIONS IN H.M. FORCES

It is anticipated that the appointments offered to foreign practitioners covered by the Order will almost invariably be in civilian employment and that only in exceptional circumstances will vacancies exist for such practitioners in the Medical Branches of the Armed Forces of the Crown. The Central Medical War Committee, therefore, does not propose to include such practitioners among those nominated for medical commissions in response to the routine demands received from the Services; but if any foreign practitioner wishes particularly to have his name considered in this connexion he should notify the Committee accordingly.

THE NEW WAR DAMAGE BILL

BY

HENRY ROBINSON, M.D., D.L., J.P.

Honorary Secretary, Medical Insurance Agency

The medical profession is deeply concerned and quite properly much interested in the provisions of the War Damage Bill now before the House of Commons. It has already become clear that it will receive the careful attention of members in both Houses; and it is likely that many amendments will be proposed, some of which will no doubt find acceptance, before it finally emerges as an Act. All sorts of questions arising from it demand and will receive the attention of the Medical Insurance Agency on behalf of the profession as a whole. To set forth a few of them may be of interest and serve to indicate some of the difficulties.

Professional and private premises present few problems: they are to be insured compulsorily and dealt with by the Revenue authorities on the basis of the Schedule A assessments in regard to value and, therefore, to premiums. As the Bill at present stands it would appear that, besides professional premises, equipment of all sorts (furniture of surgeries or consulting-rooms, instruments, textbooks, and so forth) is to be within the "business scheme" part of the compulsory section, with a limit of £1,000. Not many doctors own property of this kind exceeding that limit of value, but there may well be owners of *x*-ray plants, radium, etc., to whom this means an under-insurance. It is not perfectly clear from the wording that the contents of the residential part of the doctor's house are excluded, and it might be worth the while of the Parliamentary Medical Committee to have the point elucidated.

As regards private goods and chattels, the insurance contemplated is entirely optional. An upper limit of £1,500 is set, and a flat rate of premium at 30s.% per annum. These insurances are to be carried out, not through the Revenue authorities, but through fire insurance companies or through Lloyd's underwriters. What is to be done if there is an existing ("peace") policy of more than £1,500? Normally, where insurance is taken out for a sum less than the full value of the goods the principle of "average" is applied; but with a maximum fixed by law, any under-insurance is not the fault of the insured person, and it seems inequitable that he should suffer in pocket on that account. It will be of interest to discover, if possible, the reactions of the insurance companies on this matter. Possibly it may be in the minds of the framers of the Bill that peace and war risks will be dealt with on quite separate bases, and that "average" should apply only to cases of gross under-insurance on a peace policy and not at all to a war one. Another point is this: if an owner has a (peace) policy of, say, £2,000 on his furniture and chattels and can find a company to accept a war risk on £500, will he be free from the danger of "average" on his full £1,500 of insurance under the Act?

Further problems may arise, unless Parliament anticipates them during the progress of the Bill, over the insurance of a houseful of chattels which belong to various owners: many people just now have their furniture, or some of it, stored in other people's houses. Presumably the £1,500 limit applies to individual owners, not to individual houses. Possibly the normal provisions of existing "comprehensive" policies may be made to apply, whereby visitors' effects are considered to be covered up to a specified percentage, but this does not cover the question of the limit, and the whole position needs clarification.

Many difficulties are likely to be met with over questions of valuation of destroyed property. Professional inventories are so difficult to obtain at present, and so expensive when they can be obtained, that many knotty points will arise—and probably many heart searchings, too—when claims for compensation are put forward in respect of chattels of which no detailed inventory or accurate valuation has been on record, or when the records have been destroyed also.

For months past the Medical Insurance Agency has been procuring quotations from assurance offices for war-risk policies in respect of life, and has negotiated a large amount of business on behalf of the profession. It seems clear that the need for this supplement to normal assurance cover is as great as ever, for the compensation provisions under the Bill for dependants of civilians killed in air raids will be quite insufficient for the needs of the widow and children of a medical practitioner, whose breadwinner has been taken from them, especially as there is often to be borne as well a heavy depreciation in the goodwill of the practice. The Agency has accumulated a wide experience of these policies, all of which is at the service of those who have dependants to provide for.

EMERGENCY MEDICAL SERVICE

CLASS I AND CLASS II OFFICERS

Following prolonged negotiations between the Ministry of Health and the Advisory Emergency Hospital Medical Service Committee, agreement has been reached in regard to the position of Class I and Class II officers as from January 1, 1941, when the existing guaranteed period of service expired.

(1) Holders of Class I or Class II contracts will be given a further guarantee of employment under their existing terms of service until August 31, 1941, thus completing approximately a second period of twelve months from the outbreak of war. Thereafter service will be subject to termination on one month's notice on either side.

(2) In the case, however, of individual officers whose services are no longer required under their present contracts, the Minister reserves the right not to offer them a further guarantee of employment but to terminate their employment on one month's notice, with or without the offer of a Class III contract—that is, a contract on a sessional basis. Moreover, any guarantee of employment will cease to apply where the officer, being within an age group required to register under the National Service (Armed Forces) Act, 1939, is recommended by the Central Medical War Committee, with the Minister's concurrence, for a commission in the Medical Branch of one of the Fighting Forces under the procedure established in pursuance of that Act.

(3) The Minister further proposes to continue on their present basis the arrangements for paying the travelling expenses of Class II practitioners.

(4) The Minister intends to offer to Class I practitioners receiving salaries of £550 per annum the option of transfer to part-time service at the rate of £360 per annum plus a travelling allowance, or in the case of officers required to live away from home free board and lodging, or £100 in lieu

BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 1 1941

ANTISEPTIC SNUFFS

BY

M. E. DELAFIELD, M.B., B.Ch.

EDITH STRAKER, M.B., B.S.

AND

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Much time and thought have been given in recent years to studying the ways in which harmful bacteria and viruses pass from one person to another, and to devising methods by which such passage can be prevented. We have come to realize more clearly than we did the multiplicity of the avenues involved, and we have found some methods which should at least tend to decrease the traffic along them. Reference to recent papers by Andrewes (1940), van den Ende and others (1940), and Miles and others (1940) will show the magnitude of the problem and illustrate the methods by which it is being attacked. In addition to the primary essentials of good ventilation, the avoidance of overcrowding, and the adequate spacing of beds in sleeping quarters and in hospital wards, they include such measures as the use of aerosols or ultra-violet light to kill bacteria in the air, the use of spindle oil to prevent those that fall to the floor from rising again as dust, the avoidance of infected fluff from blankets, and the use of masks, worn either to protect other people from the wearer or the wearer from his environment, including other people. In attempts to prevent cross-infection among the wounded the whole range of surgical technique in the wards has been reviewed, and suggestions have been made for its improvement.

There is one conclusion to which, we think, all workers in this field will subscribe. There is no sovereign remedy. If the problem is solved it will be by strengthening all possible defences, not by developing some and neglecting others; though we may be able to allot priorities when we know more than we do now about the relative importance of the various channels of infection.

Some six months ago we started to approach one aspect of the problem from another angle. Of the many methods so far practised or advocated, most are aimed at reducing the concentration of bacteria or viruses in the air. The mask is the only measure at present in common use for preventing the passage of micro-organisms from or to the nose and mouth of its wearer. The mask will certainly be retained as an integral part of any aseptic hospital technique, and it may be possible to encourage its use as a method of personal protection in the presence of unusual risks; but for this purpose it is an inconvenient instrument, unlikely to be worn continuously or by a large proportion of all those exposed to infection or those capable of infecting others. If it were possible to replace it by some method of personal antisepsis something might be gained. It is this possibility that we have tried to explore.

If it is to be applicable on a wide scale and in a variety of circumstances any method chosen must fulfil the following conditions: (1) it must be easy to apply personally; (2) its application must not itself involve any risk of cross-infection; (3) it must maintain an adequate concentration of the antiseptic material in the right situation over prolonged periods of time; (4) it must be non-toxic, even when used continuously for weeks or months.

Among the methods that have often been advocated for personal prophylaxis is the use of antiseptic gargles. As a recent instance Young and Charteris (1940) state that they have obtained favourable results by the use twice daily of an acriflavine gargle in throat-and-nose wards.

A gargle is easy to apply personally under hospital or home conditions, and given a suitable antiseptic it is non-toxic. Unless a separate glass or vessel is supplied for each gargler, and care is taken that there is no sharing, the method is by no means free from the risk of itself providing an avenue of cross-infection. It produces its result mainly in the mouth and tonsillar region, and to a much less extent in the nasopharynx. It is doubtful whether, even in these situations, an adequate concentration of antiseptic can be maintained for very long after gargling. To maintain a bactericidal or bacteriostatic concentration throughout the twenty-four hours it might well be necessary to gargle a dozen times or more. The method will have no effect on the nose. For these reasons it did not seem to be a promising method of approach.

An antiseptic snuff seemed to offer better hopes of success. It is extremely easy to apply personally. Distributed in a separate container to each person it involves no risk of cross-infection in its application. Being in the form of a powder it adheres to the mucous membrane of the nasal cavities, and to some extent to the nasopharynx. In each person it will follow the course of the inspired air currents. There is, it may be noted, an extensive literature on the direction of these currents, which is summarized by Lucas and Douglas (1934). If the snuff is, at least in part, in the form of particles of the same order of size as a bacterium it is probable that the distribution of inspired bacteria and inspired snuff will be approximately the same. Being in the form of a powder the antiseptic will probably be dissolved slowly in the nasal mucus; and it should be possible to maintain an adequate concentration of any selected antiseptic for a period of days or weeks by relatively few daily applications. We decided, therefore, to study the effects of antiseptic snuffs.

Methods Employed

The main object that we had in view was to find some antiseptic snuff that would prevent the successful lodgment and multiplication of bacteria entering with the inspired air; but it seemed improbable that we should learn much from experiments with purposely inspired bacteria, since recognizable non-pathogens would not survive long in any case. We decided, therefore, to study the effect of our antiseptic snuffs on the existing flora of the nose and throat. It seemed probable that if these reagents proved capable of eliminating, or of greatly reducing in number, one or more of the potentially pathogenic species that are often present in the nose or throat they would suffice to hold in check fresh entrants of the same species.

Preliminary experiments with nasopharyngeal washings and with swabs taken and plated in the customary way convinced us that neither of these methods offered any hope of obtaining quantitative findings of the kind that we required. It also became clear that we should have to elaborate our method, taking separate samples from each nasal cavity, from each tonsil, and from the nasopharynx, in each subject under test. The technique finally adopted was as follows.

All subjects under test were examined three times a week on consecutive days. Using a head-mirror and a nasal speculum, separate swabs were obtained from the left and right nasal cavities, care being taken to sample the anterior end of the middle turbinate whenever possible, and the anterior portion of the middle meatus. Using a tongue depressor, three more swabs were taken, one from the left tonsil, one from the right tonsil, and one from the nasopharynx. The swabs used were as nearly as possible of the same size and were mounted on wooden handles.

As soon as it was taken each swab was emulsified in 2 c.cm. of nutrient broth contained in a 5-c.cm. screw-capped bottle. The swab was rotated twenty times and then pressed against the side of the bottle; and this procedure was repeated three times. The swabs were then discarded. After allowing any obvious particles to settle, the fluid was drawn up in a sterile dropping pipette (50 drops to 1 c.cm.), and 30 drops were allowed to fall in the centre of a sterile 4-inch Petri dish. A sterile 7-cm. No. 1 Whatman filter paper was then lowered on to the Petri dish with sterile forceps, when, as had been found in preliminary experiments, it quickly took up the 0.6 c.cm. of fluid without leaving more than a general dampness on the bottom of the dish. The filter paper was then lowered with sterile forceps on to the surface of a blood-agar plate. As soon as contact had been made it was removed and discarded.

The plates were incubated at 37° C. for forty-eight hours and a preliminary examination made after twenty-four hours. After the full period of incubation they were placed in a blackened box, illuminated with strip lights, and photographed with a Leica camera giving a reduction of approximately 1:4.

At the twenty-four-hour and forty-eight-hour examinations of the plates the colonies were inspected, and films were made to determine the morphology of the bacteria present. In the case of staphylococci, in addition to examining for pigment formation, coagulase tests were done on colonies from many plates, but not from all. So far as other organisms were concerned no attempt was made to carry identification further than colony form and microscopical examination, except that doubtful colonies of pneumococci were tested for bile-solubility and the few haemolytic streptococci for the production of soluble haemolysin.

Although this method gave us better quantitative results than any other that we tried it will be clear that the sampling has remained inadequate, and that large variations must be expected apart from any treatment.

Fig. 1 shows the plates obtained from the right nasal cavity, nasopharynx, right tonsil, and left tonsil of a person not carrying any considerable number of bacteria in the nose. These five plates give a fair average picture of the results obtained with those persons who are not nasal carriers. The tonsils almost always give heavy growths, the nasopharynx less heavy, while the nasal cavities yield few colonies or none.

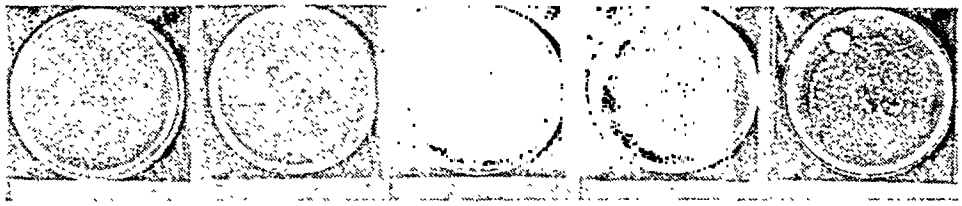


FIG. 1.—Normal Subject. Left to right, blood-agar plates from right nasal cavity, left nasal cavity, nasopharynx, right tonsil, left tonsil. No treatment.

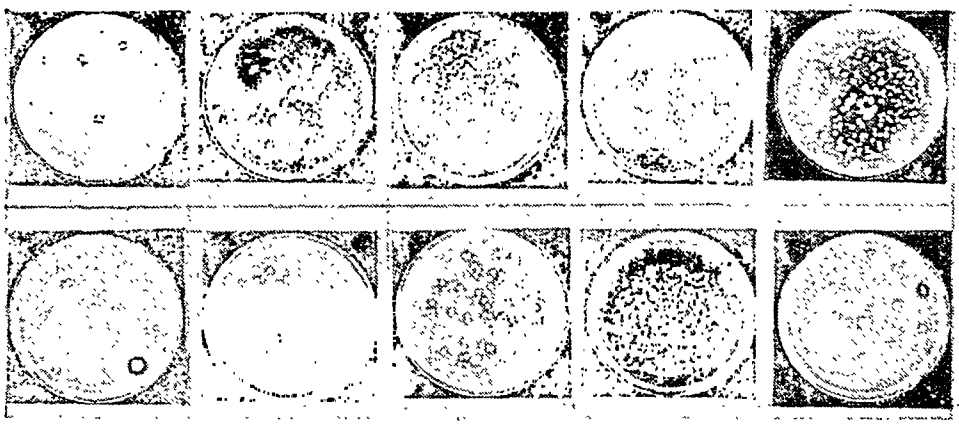


FIG. 2.—*Rows 1 and 2.* Subject C. Five successive blood-agar plates from right nasal cavity (Row 1) and from left nasal cavity (Row 2). No treatment.

Fig. 2 shows the results of five successive nasal swabbings in a subject (C) carrying staphylococci. The plates in the first row are from the right nasal cavity, those in the second row from the left. They show the kind of variation that can be expected as the result of differences in sampling, apart from any treatment.

The Antiseptic Snuffs Tested

In preliminary experiments, and before our technique of sampling had been fully developed, we tested a variety of materials, including ordinary tobacco snuffs, and lycopodium snuffs containing sodium sulphate with or without menthol, to see whether the stimulation of the normal nasal secretion would have any bactericidal effect. The results were not promising, and by the time that we had arrived at the methods outlined above we were using snuffs containing proflavine, penicillin, or sulphathiazole, with lycopodium powder or magnesium carbonate as a base. Sulphathiazole was selected in preference to other sulphanilamide compounds because of its greater action on staphylococci. Some snuffs had menthol added, some had not. The only snuffs that need be considered further are the following.

Proflavine Snuff:
5 parts by weight proflavine
5 „ „ „ menthol
90 „ „ „ lycopodium

Penicillin Snuff:
1 part by weight penicillin
5 parts „ „ menthol
94 „ „ „ lycopodium

Sulphathiazole Snuffs:
10 parts by weight sulphathiazole
5 „ „ „ menthol
85 „ „ „ lycopodium

10 parts by weight sulphathiazole
1 part „ „ menthol
89 parts „ „ magnesium carbonate

10 parts by weight sulphathiazole
90 „ „ „ magnesium carbonate

In the case of sulphathiazole we purposely started with minimal doses, to see whether we could obtain significant effects with amounts that would almost certainly prove non-toxic even when taken over long periods. The magnesium carbonate was substituted for the lycopodium because of the possibility that the continued inhalation of lycopodium spores might induce a hypersensitivity. For the small sample of penicillin at our disposal we are indebted to Prof. Florey. The properties of the crude substance as originally described by Fleming (1929, 1932) and by Fleming and Maclean (1930), together with the curative or protective effect of the purified product and its absence of toxicity (Chain and others, 1940), led us to hope that this might be a particularly favourable material for our purpose.

Results with Nasal Carriers of Staphylococci

In all we have examined 20 persons, the number of swabbings made from each varying between 16 and 32. None of the snuffs we have tested has had any detectable effect on the bacterial flora of the nasopharynx or tonsils. That they reach the nasopharynx can easily be demonstrated. With snuffs containing proflavine a trickle of yellow mucus can often be seen passing in a narrow stream from the posterior nares, frequently on one side only. With any lycopodium snuff the spores can easily be detected in swabs from the nasopharynx, and sometimes from the tonsillar region. It is probable, however, that the distribution is localized, and that the bactericidal substance employed reaches an effective concentration only in a few areas.

When it became clear that the only demonstrable effect of the snuffs was exerted on the nose, we examined, for nasal carriers of staphylococci, as large a number of subjects as were available. Those we discovered are included in the 20 subjects referred to above. In these carriers we swabbed the nasal cavities only, reserving complete swabbings for the six subjects who had formed our experimental material from the start of the investigation.

The results are not of a kind that can usefully be tabulated or be submitted to any statistical tests. All subjects were examined on three or more occasions before any treatment was begun. Some were given one variety of snuff only. Others who failed to respond to one snuff, or whose nasal staphylococci returned after temporarily disappearing or lessening in number, were subsequently treated with snuff of another kind. All that can usefully be done is to give some illustrative examples.

Penicillin

Four subjects in all were treated with penicillin snuff—this small number being due to the small supply of penicillin available. One subject was treated with penicillin alone. In three subjects a short treatment with penicillin was followed by further treatments with proflavine and with sulphathiazole. In all these four subjects the penicillin was effective in greatly decreasing the number of staphylococci, though one subject was carrying only small numbers before the treatment started. In the three subjects that were treated for short periods (seven to ten days) the staphylococci returned after the treatment was discontinued. Chart I shows the successive staphylococcal counts in the left and right nasal cavities of the subject (B) treated with penicillin snuff alone. Chart II shows the fall of the staphylococcal counts in a subject (T) treated for a short period with penicillin, and the subsequent rise a few days after the penicillin was discontinued.

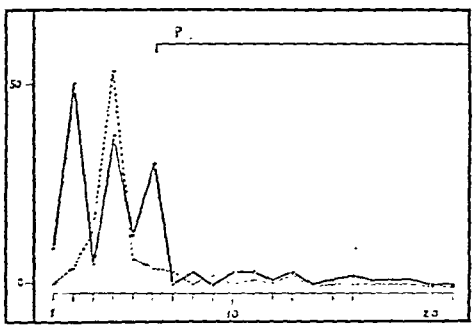


CHART I.—Subject B. Period of treatment with penicillin snuff. (For other details see text.)

In all charts the counts from the left nasal cavity are represented by a continuous line, those from the right nasal cavity by a dotted line. The figures marked along the base line represent successive swabbings, not successive days. In most subjects the routine of swabbing was uninterrupted, so that the interval between any swabbing and the third following it represents seven days.

In these and other counts the ordinates represent the number of staphylococcal colonies counted on the blood-agar plates after forty-eight hours' incubation. Counts of over 100 were recorded as > 100, and are marked as 100 on the charts. Both orange and white colonies are included. The proportions of these colonies often varied widely from one swabbing to another in the same person, and coagulase tests gave positive results with many colonies that showed no trace of orange pigment. Since it was impossible to submit every colony from every plate to a coagulase test the only practicable method was to include them all. We do not think that this has involved any considerable error in the earlier parts of the records or charts. All the subjects selected for these tests were relatively heavy nasal carriers; and it seems

to be uncommon to isolate large numbers of non-pyogenic white staphylococci from the nasal cavities. It is probable that the recording of all staphylococcal colonies has tended to some under-estimation of the reduction following the use of the antiseptic snuffs. In most cases the small numbers of colonies isolated during the later stages of treatment have been of the white variety; but in others a few typical golden colonies have been isolated after an antiseptic snuff has been taken for several days or weeks.

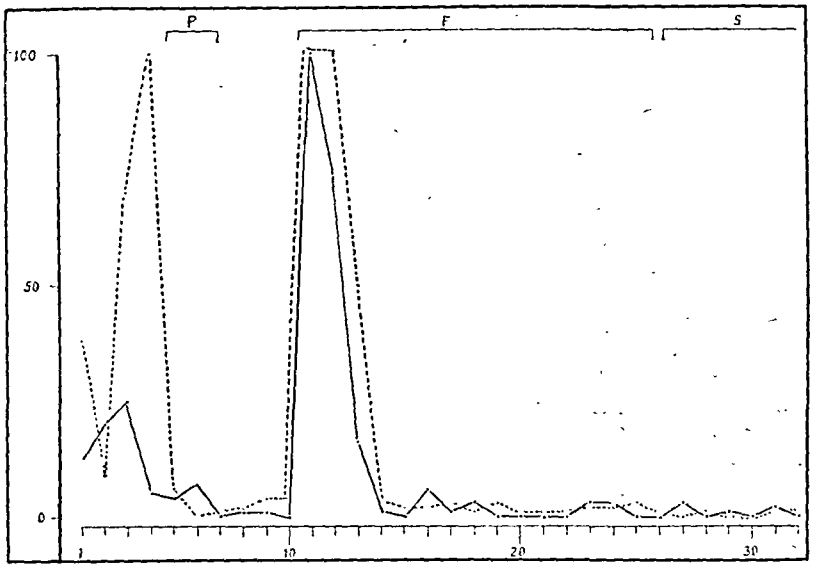


CHART II.—Subject T. P=Period of treatment with penicillin snuff. F=Period of treatment with proflavine snuff. S=Period of treatment with sulphathiazole snuff.

Proflavine Snuff

Nine subjects were treated with proflavine snuff. All of these received other types of snuff either before or after treatment with proflavine. In almost every case there was evidence that the proflavine had an effect on the staphylococcal count, and in some instances the reduction was great; but in some subjects the count, though diminished on the average, showed wide fluctuations. In Chart II it will be noted that Subject T showed a sharp rise in both nasal cavities soon after he began to take proflavine snuff, though previous treatment with penicillin snuff had been followed by a reduction in staphylococci almost to zero. Chart III shows the changes produced by proflavine in a heavy carrier of staphylococci (Subject S). It will be noted that, after wide fluctuations while taking proflavine snuff, the staphylococci were reduced to continuously low figures under the influence of sulphathiazole, the plates on many occasions being sterile. Fig. 3 shows six of the plates obtained from the right and left nasal cavities of Subject S, the first two before any treatment was given, the next two while taking proflavine, and the last two while taking sulphathiazole.

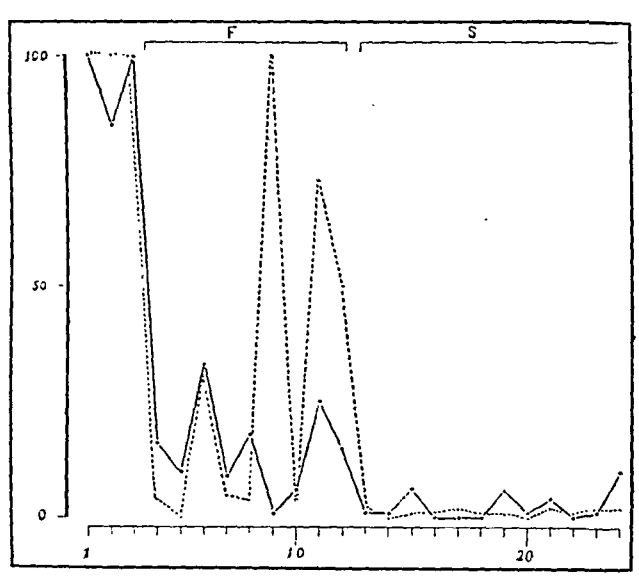


CHART III.—Subject F. F=Period of treatment with proflavine snuff. S=Period of treatment with sulphathiazole snuff.

Sulphathiazole Snuff

Nineteen subjects were treated with sulphathiazole snuff. Ten of these were treated with sulphathiazole alone. The other nine had previously been treated with proflavine or with proflavine and penicillin. The results in general were very promising. Several subjects showed a great reduction in staphylococci; in some these almost disappeared. Two cases have so far proved relatively resistant, though in one of these there was a reduction in one nasal cavity after three days on sulphathiazole and in the other after seventeen days. Chart IV shows the reduction in staphylococci in Subject W under treatment with sulphathiazole, and Chart III shows, in Subject S, the effect of sulphathiazole following proflavine. Fig. 4 shows six of the plates obtained from Subject W, the first three before taking sulphathiazole, the second three afterwards. The plates in the first row were obtained from the right nasal cavity, those in the second row from the left.

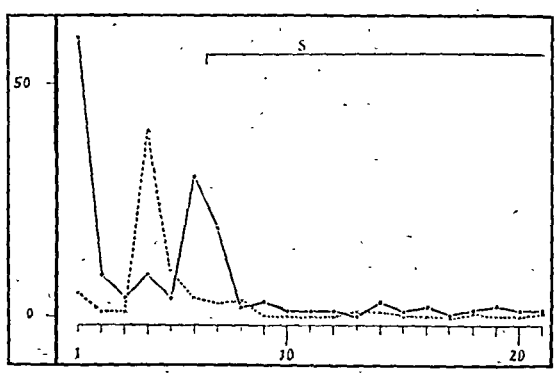


CHART IV.—Subject W. S=Period of treatment with sulphathiazole snuff.

Control Snuff

During an early stage of the investigation three subjects were treated with a control snuff containing only menthol (5%) and lycopodium. None showed any significant change in the nasal flora.

Results with Other Organisms

Staphylococci were not, of course, the only organisms cultivated from the nasal cavities of these 20 persons. In regard to other bacteria a few points are worth noting. Several subjects carried a diphtheroid bacillus which had the morphological appearance of Hoffmann's bacillus but was not further identified. The action of sulphathiazole snuff on this was dramatic. The organism in most cases entirely disappeared shortly after treatment was started. It is quite possible that both penicillin and proflavine would have produced a similar result had similar cases been treated with these snuffs.

A Gram-negative coccus of the *N. pharyngis* type was present in a few subjects. This proved much more resistant than staphylococci both to penicillin and to sulphathiazole. We had no opportunity of testing its resistance to proflavine.

The findings in regard to pneumococci were curious. Not many subjects were nasal carriers of this organism, but in a few cases it appeared while a subject was taking

sulphathiazole snuff, and in some others this snuff failed to rid the nasal cavities of pneumococci that were already present. We have had no opportunity of estimating the effect of penicillin or proflavine on nasal carriers of this organism.

Antiseptic Snuffs in Relation to Colds

There is no evidence that any one of the three antibacterial substances tested has any action on filterable viruses. They would not therefore be expected to have any effect in preventing the acute infectious cold, and no such effect was in evidence. Several subjects developed colds, in most cases very mild, while taking one or other of the snuffs. There was, however, a suggestion that the sulphathiazole, and perhaps the proflavine, had an effect in modifying the course of a cold. One subject with a long history of characteristic colds in previous winters developed a cold that lasted for several weeks, with a relatively copious mucous discharge. Contrary to the experience of earlier years the mucous discharge remained clear throughout, plates from the nasal cavities remained almost sterile, and there were none of the symptoms usually associated with the later stages of a cold when the discharge has become purulent. Another subject, whose nasal cavities were not being swabbed, had a similar experience. A third person, also not included in the bacteriological survey, started to take sulphathiazole snuff on the second day of an acute cold. This cold cleared rapidly, and without the muco-purulent discharge to which the person in question was accustomed. We have had no opportunity of studying the effect of penicillin snuff in similar circumstances.

Discussion

The cases examined in this investigation are far too few to justify any definite conclusion. In normal times we should have hoped to study many more cases before publishing our findings. But the times are not normal, and we are therefore putting these findings on record in the hope that others may be able to test the significance of the results we have obtained, which at the moment are clearly no more than suggestive.

Of the three snuffs we have tried we should not ourselves regard it as worth while to proceed further with proflavine. It has proved less effective than either penicillin or sulphathiazole, and its bright yellow colour is singularly unattractive on the nostrils, the upper lip, or the handkerchief. It seems quite probable that penicillin will prove particularly effective as an antiseptic snuff. We hope later to have an opportunity of putting it to a more adequate test, alone or in combination with sulphathiazole. At the moment we think that the snuff most worth testing is the simple mixture of sulphathiazole and magnesium carbonate, though we suspect that the percentage of sulphathiazole might be increased with advantage. As regards administration, it seems better to avoid using the fingers and so possibly contaminating the snuff in a box. We have dispensed the snuff in small cardboard pill-boxes holding about 1 gramme. An easy method of taking the snuff is to cut or tear a small triangle of paper, and to load one corner with a large pinch of snuff for each nostril. In recent trials we have, quite arbitrarily, instructed the subjects under test to take the snuff six times a day. Used at this rate 1 gramme lasts for three to four

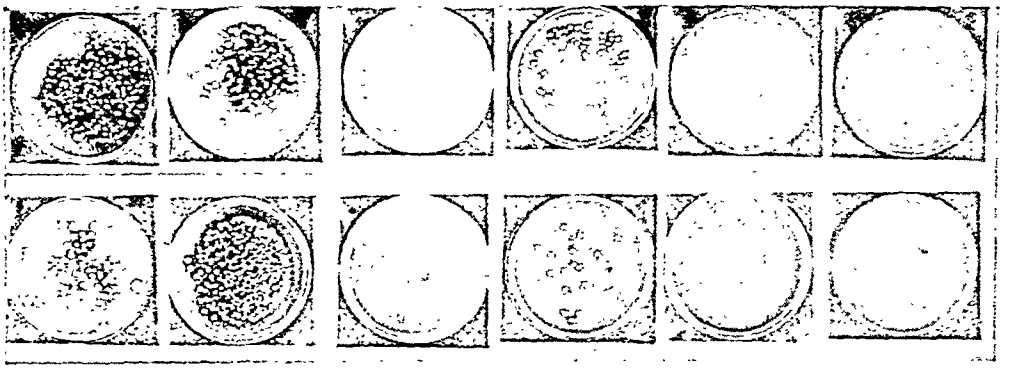


FIG. 3.—*Rows 1 and 2.* Subject S. Six blood-agar plates from right nasal cavity (Row 1) and from left nasal cavity (Row 2). 1 and 2 before taking snuff, 3 and 4 while taking proflavine snuff, 5 and 6 while taking sulphathiazole snuff.

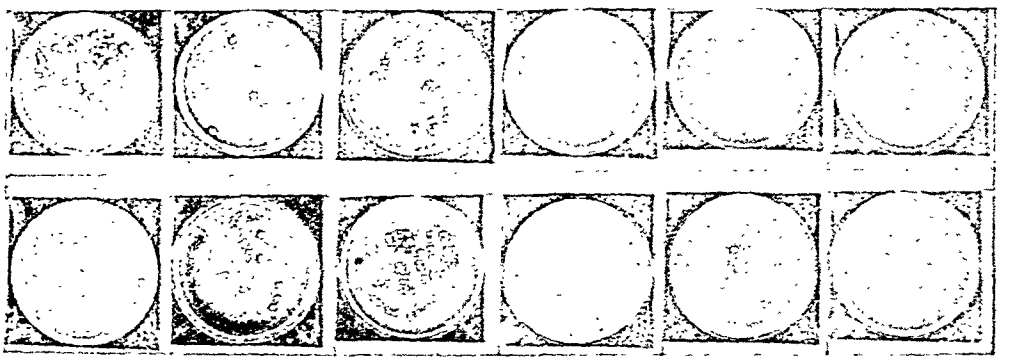


FIG. 4.—*Rows 1 and 2.* Subject W. Six blood-agar plates from right nasal cavity (Row 1) and from left nasal cavity (Row 2): 1 to 3 before taking snuff, 4 to 6 while taking sulphathiazole snuff.

days. This involves the taking of approximately 0.03 gramme of sulphathiazole a day. It is very doubtful whether even this small amount is absorbed. Certainly much of the snuff remains in the nasal mucus, and thence escapes on to the handkerchief. It seems very unlikely that any toxic symptoms would develop from doses of this order, however long they were continued. In view of the apparent failure of sulphathiazole, in the doses employed, to act effectively on pneumococci, against which the drug is known to be active, we think that larger or more frequent doses of snuff, or a higher concentration of the drug, might well be used in future tests.

How far the snuff will be useful as a prophylactic it is impossible to say. It seems reasonable to suppose that, in so far as it can diminish the number of existing pathogens in the nasal cavities, it should help to prevent the multiplication of fresh entrants of the same species in the same situations. As has been noted, an antiseptic snuff has no demonstrable effect on the pre-existing flora of the nasopharynx. It does not follow that it will not reduce the frequency of successful colonization by new entrants through the nasal passages. Some of them may be caught and destroyed on their way through the nose. Moreover, as has been noted above, the snuff certainly gains access to the nasopharynx, and some of it adheres to the mucosa and must therefore lead to a local concentration of the antiseptic. Since inspired bacteria will probably lodge in the same situations, the snuff may be more effective in dealing with these than with the more widely dispersed normal flora. On bacteria breathed in through the mouth it will presumably have little if any effect.

So far as the cure of nasal carriers is concerned, it will be noted that we have not yet succeeded in freeing the nose completely from staphylococci, and have no data as to what happens after the taking of sulphathiazole snuff is stopped. It seems very probable that treatment would have to be continued for a long time to effect any permanent cure, and that, in cases in which organisms are vegetating in deep crypts or in any of the nasal sinuses, an antiseptic snuff would do no more than hold in check the surface colonization.

There is one general criticism that might be made of all our findings with proflavine and penicillin snuffs. It might be argued that the low counts obtained during the period of treatment were due not to any diminution of staphylococci in the nasal cavities but to a reduced growth on our plates resulting from the carrying over of sufficient proflavine or penicillin to produce an inhibitory effect. We do not think that this possibility can be ignored. Swabs were never taken less than two hours after the last administration of snuff, but the active substance may dissolve and diffuse slowly in the nasal mucus. The concentration of the antiseptic in the broth suspension probably varied widely as the result of sampling differences, and may sometimes have been sufficient to inhibit growth. We have no records of swabbings taken several days after proflavine snuff had been discontinued and no other snuff substituted; but Subject T remained almost free from staphylococci for eight days after a short course of penicillin snuff, and it seems very unlikely that an inhibitory concentration could have been present at this period.

The same criticism does not apply to the results obtained with sulphathiazole, since this substance has no inhibitory effect on the growth of staphylococci on plate cultures.

With these reservations we think that the following suggestions are in conformity with the very scanty evidence.

1. An antiseptic snuff containing sulphathiazole or penicillin may lessen the frequency of effective invasion of the nose by bacteria or the invasion of the nasopharynx through the nose. It may therefore prove of use as a prophylactic against bacterial infections of the upper respiratory tract and perhaps against cerebrospinal meningitis, though on the latter point we have no direct evidence apart from the known activity of the sulphanilamide compounds against the meningococcus. The most that can be said at the moment is that the method seems worthy of trial.

2. There is no evidence that it will prevent or cure the common infectious cold. It may favourably affect the course of a cold by preventing secondary bacterial infection.

3. It may perhaps prove effective in curing nasal carriers of staphylococci or in reducing the number of vegetative organisms, so that the carrier becomes less dangerous as a source of infection to others.

4. In view of its action on diphtheroids it seems desirable to test its possible usefulness in the treatment of nasal carriers of diphtheria bacilli.

5. How far it will affect other pathogenic organisms in the nose there is as yet no evidence.

Since none of the antiseptic snuffs we have tested has had any effect on the nasopharyngeal or tonsillar flora we have attempted to influence these flora by the use of tablets containing proflavine or sulphathiazole. These tablets have been gently sucked in the hope of inducing an effective concentration in the throat. Neither has given any demonstrable results, and the aesthetic effects of proflavine tablets have been even less attractive than those of proflavine snuff. We are now investigating the possibility of influencing the nasopharyngeal and tonsillar bacterial flora by the oral insufflation of antiseptic powders; but these trials are as yet in their earliest stages.

Finally we wish to express our thanks to all those who have co-operated with us by taking our snuffs and by submitting to repeated swabbings over many weeks or months.

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Malaria in Bengal.—In his report for 1938 Lieut.-Colonel A. C. Chatterji, Director of Public Health, Bengal, states that malaria took away 416,521 lives with a death rate of 8.3 per mille in the year under review, against 372,992 with a death rate of 7.5 per mille in 1937—an increase of 10.6% in the death rate. Malaria accounted for 50.8% of the total fever mortality and for 31.0% of the total provincial mortality. The statistics provide clear and telling evidence of what the future of Bengal villages will be unless adequate measures are devised without loss of time. Malaria is the most important and direct cause of physical unfitness and extensive economic ravages of the population. In Bengal 93% of the people live in villages, but the proportion of malaria between the rural and the urban areas is 99.3 and 0.7 respectively. Altogether 4,273,307 cases of malaria were treated in 1938 in the various hospitals and dispensaries in Bengal, but this number is only a small fraction of the annual malaria incidence in rural and urban areas. It has been estimated that the total incidence is somewhere between 30 and 40 million cases out of a population of 51 millions in this Province of India. Bengal could easily consume 350,000 lb. of quinine every year in the treatment of malaria, but during 1937–8 the amount used was only 112,353 lb. The comprehensive malaria survey of representative areas in different parts of the Province was continued uninterruptedly during the year. The mosquitos collected from the villages surveyed were identified locally by trained assistant epidemiologists in charge of survey parties, and were also sent to the Bengal Malaria Research Laboratory, Calcutta, for checking and confirmation.

DIARRHOEAL DISEASES IN GLASGOW

BY

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Interest in diarrhoeal disease was intensified following the appointment of a subcommittee on enteritis in infancy by the Preventive Medicine Committee of the Medical Research Council. I am indebted to Dr. A. S. M. Macgregor, a member of the committee, for the suggestion to compile this review of the prevalence of the diarrhoeal diseases in Glasgow, with special reference to non-specific enteritis. The incidence of these diseases is indicated in the following list, which shows the average number of deaths or cases registered annually:

Diarrhoea and enteritis (all ages), 1919-38	422 deaths
Bacillary dysenteries, 1919-38	90 cases
Typhoid, 1925-38	41 "
Paratyphoid, 1925-38	63 "

The specific infections in the above order have shown an average primary fatality of 5, 15, and 5% respectively. As regards the fatality of non-specific diarrhoea, Cooper (1937), studying 300 cases of acute (mild and severe) and chronic gastro-enteritis in a Glasgow children's hospital, recorded a case mortality of 47%. A measure of the morbidity from non-specific enteritis is thus provided, because on an annual average 70% of the deaths from enteritis in patients under 2 years of age occur in hospital.

Age and Sex Distribution

The average age distribution in the non-specific group has been as follows:

	−1	−5	5+	Total
Deaths	293	60	64	422
Percentage	71	14	15	100

Infants are therefore mainly involved. In the specific groups infections of infants are few. Of 908 dysentery patients registered during the past four years, 412 (45%) were under 15 years of age, but only thirty (3.3%) were under 1 year. Similarly, only 2% of paratyphoid and less than 1% of typhoid patients are under 1 year old.

The distribution of the sexes also varies in the different groups. For dysentery it is approximately equal. Among enteric cases, especially paratyphoid, females exceed males —a reversal of sex incidence in years preceding 1914 that has been chiefly attributed to extensive wartime inoculation of males. Infantile digestive diseases, on the other hand, kill 140 males for every 100 females. However, the proportion of infantile mortality in each sex due to digestive disease is approximately the same for males and females—namely, 14 to 15%.

Annual Incidence

The "residual" numbers of the specific infections are occasionally multiplied through agencies which may or may not be recognized. Thus in 1935 forty-one pilgrims imported typhoid; in 1936 paratyphoid notifications numbered 195; and during the period 1935–8 the annual dysentery notifications averaged 227, of which 101 were notifications of infections contracted annually in institutions. Deaths from non-specific diarrhoea show relatively smaller fluctuations. During the past twenty years these have ranged between 279 and 536, excepting 1921, when they numbered 702.

The annual fluctuations in the several diarrhoeal diseases seem mutually unrelated. Between 1919 and 1938 there was increased annual prevalence of one or more of these diseases on thirteen occasions. In eight of these years one or another of the diseases was increased alone; on the remaining five occasions varied associations between the diseases were recorded.

The average of 422 deaths, constituting a death rate of 0.374 per 1,000 living, represents a definite but disappointingly moderate improvement on the rates of 0.843 for the period 1891–1900 and 0.681 for the period 1901–10. Indeed, as long ago as 1909 and 1910 the corresponding rates were 0.130 and 0.161 respectively. On the other hand, the enteric death rate, which was 0.215 in 1891–1900, has now fallen to the low level of 0.010. As annual causes of infantile mortality, digestive diseases continue to be exceeded only by immaturity and respiratory diseases; infrequently infectious disease rises from fourth to third place.

Seasonal Incidence

The following table shows the seasonal incidence of deaths under 1 year from diarrhoea and of their quarterly peak during the decennium 1928–37:

	Quarter				Total
	1st	2nd	3rd	4th	
Deaths	573	603	915	941	3,032
Quarterly peak			7	3	10

Enteric infections, especially typhoid, and non-institutional dysentery also tend to reach a peak in the third quarter, the warmest of the four quarters; but the non-specific group alone reveals the regular occurrence in another quarter of an alternative seasonal peak. Cooper recorded that half his patients had been ill for only a week or less. The high incidence of non-specific diarrhoea in the fourth quarter is therefore not altogether due to the termination in that quarter of illnesses previously contracted.

Graham (in 1936) held that the incidence of infantile mortality from diarrhoea now tended to show a winter instead of a summer peak owing to respiratory infections. The researches of otologists in other parts of the country into the association between otitis and gastro-enteritis lend support to this view, as also to their injunction to mothers to shield their infants from adults suffering from colds or influenza. In Glasgow, too, as described below, an institutional outbreak of presumably virus origin, which caused 7 neonatal deaths among 9 cases during the early part of 1938, was marked by rhinitis at onset, although the terminal phases consisted of enteritis. Nevertheless the seasonal behaviour of the non-specific group can still be described as generally "diarrhoeal" rather than "respiratory" in character. As indicated by the monthly mean shade temperatures, the warmest month of the year is usually July, less frequently August, and deaths from infantile diarrhoea continue to reach their monthly peak, as they did in years preceding 1914, during August or, somewhat less often, in September. Moreover, Macgregor (1933) has pointed out that while bronchopneumonia has an irregular seasonal incidence lobar pneumonia regularly maintains high prevalence during the first four months of the year. As shown above, infantile mortality from diarrhoea is relatively low during the early months of the year. Similarly, Stirk Adams (1937) reported that paracentesis operations for otitis media in a children's out-patient department in Birmingham showed a winter crest and a September trough; whereas, as we have seen, September is a month of high incidence of gastro-enteritis.

Housing Accommodation and Fatal Enteritis

As enteritis is not a notifiable disease epidemiological information regarding cases is generally meagre. During the years 1926–32, however, information regarding size

of house and number of inmates was noted in connexion with the registration of 2,163 deaths from diarrhoea in children under 2 years of age. The opportunity has been taken to compare the housing accommodation of these children with the size of house noted in connexion with a series of births:

	Apartments				Total
	1	2	3	4+	
Births	12	37	29	22	100%
Diarrhoeal deaths under 2 years ..	36	52	10	2	100%

A disproportionate incidence of diarrhoea among the children in the smaller houses is apparent. This analysis also revealed, incidentally, that the housing distribution of births was very similar to the size distribution of all Glasgow houses. In the following table, therefore, one may reasonably compare the percentage of various sizes of houses known to be overcrowded in Glasgow with the percentage of overcrowded houses among the homes of the 2,163 fatal diarrhoea cases:

	Apartments				All Houses
	1	2	3	4+	
Percentage of houses overcrowded:					
[illegible] ..	52	43	18	4	31
[illegible] ..	94	80	47	23	82

A striking degree of overcrowding among the diarrhoea cases is seen when compared with overcrowding existing generally in the city.

To corroborate this finding an effort was made to ascertain the degree of overcrowding among births. Such information is available from health visitors' records regarding midwives' births—i.e., births at which there is no medical attendance. The housing conditions in a series of these births were as shown:

	Apartments				All Houses
	1	2	3	4+	
Midwives' births: size of house .	37	47	12	4	100%
Midwives' births: percentage overcrowded	66	47	33	21	51

A close resemblance is seen between the size distribution of these poor houses and the size distribution, previously tabulated, of the houses of the fatal diarrhoea cases. It is therefore noteworthy that the overcrowding even among the poor homes of the midwives' births falls short of the overcrowding, previously tabulated, in the homes of the diarrhoea cases. The apparent effect of overcrowding is not due, as in the incidence of the infectious fevers, to the frequent occurrence of multiple cases in the same house; for such association of cases, which mainly concerned twins, was very uncommon.

Prevention of Enteritis

In discussing prevention practically all the authorities stress the importance of breast feeding. Still (1933) recorded that 96% of his fatal cases of infantile diarrhoea had occurred among artificially fed children. Graham laid emphasis on breast feeding, hygienic environment, and the maintenance of weight; and ascribed to children in Glasgow under 70% of their normal weight a diarrhoea mortality more than twice as high as among children of normal weight. Cruickshank (1937) specified as the important adverse factors artificial feeding, infancy, unhygienic surroundings, and raised internal or external temperatures. It is of interest to note that Ebbs (1937) also stressed the importance of breast feeding in his discussion of post-mortem examination of 880 children, 80% of whom had died under 2 years of age from all types of medical and surgical conditions. Of these children under 2 years old 238 had suffered from gastro-enteritic symptoms, and 193 of these had had otitis media, while purulent ear material had been found post mortem in 52% of the entire group studied. Only a negligible number of all these children had been breast-fed. On the whole it is accepted that breast feeding (or suitable and careful artificial feeding) and hygienic surroundings are important factors in the prevention of gastro-enteritis as of other infantile diseases. Apart from illness due to any pathogenic bacteria in prepared foods as sold, unsuitable food could obviously result in digestive disorder, while careless feeding could act by conveying infection. In Glasgow, as described above, enteritis deaths are associated with the two unhygienic environmental factors of small size of house and overcrowding of house, and such factors could presumably operate either by impairing vital functions or by facilitating the spread of infections.

Infective Enteritis

Thus both infection and physiological upset appear to play a part among the non-specific diarrhoeas. When cases occur acutely in groups infection is naturally suggested; in other instances digestive derangement seems sufficient explanation. A link between the two types of cases is provided by the work of Blacklock, Guthrie, and Macpherson (1937). They found a sequence of events in infantile gastro-enteritis consisting of impaired gastric secretion, interference with normal acidity, and ascent of coliform organisms to the upper part of the small bowel; and held that these events could be initiated by fever due to an infection as well as by unsuitable feeding, even on occasion by feeding with cows' milk.

Outbreaks of non-specific enteritis outside institutions have not attracted attention in Glasgow. In 1929 one such outbreak was discovered through its association with an epidemic of dysentery. The dysentery epidemic was regarded as comprising 51 persons, although positive specimens were obtained from 35 only. In the non-specific outbreak specimens were examined from 93 persons. At the same time as these two outbreaks were proceeding side by side a morbidity inquiry was being conducted in a neighbouring district, and no cases of infectious diarrhoea were discovered there.

The limited extent of the prevalence of the specific diarrhoeas among even infective cases of diarrhoea thus illustrated increases the importance of the non-specific group and of its study. In a few localities hospital arrangements have been made which diminish possible spread of infection within the institution and at the same time facilitate investigation. For these arrangements the energetic co-operation of the hospital administration is necessary.

Hospital Arrangements

Mitman (1937) and Joe (1937) described their arrangements for the segregation in special wards planned on the "cell" system of all cases of non-specific enteritis, primary or secondary to infectious disease, occurring in two L.C.C. fever hospitals. Special attention was devoted in these wards to the handling of food and to the prevention of cross-infections, whether respiratory or enteral.

The segregation of cases of non-specific enteritis admitted to or sickening in general institutions would also be a valuable procedure. Although open wards, preferably small, might have to be used in some instances, cubicles or compartments are desirable, since a variety of infections may be concerned. The possession of a training qualification in fever by the nursing staff attending

these cases would obviously be an advantage. Epidemiological, clinical, pathological, and therapeutic studies would be facilitated by special wards. Any grouping of cases could be recognized by noting the ward or address of sickening of the cases. The incidence and nature of parenteral complications could be recorded. Cooper, for example, found that 40% of his 300 cases had parenteral affections; of these 122 cases 78 had otitis media, 11 pyuria, and 9 bronchopneumonia. Routine examination of ears, such as was reported by Maizels and Smith (1934), could also be performed, and that preferably by an otologist owing to the difficulties in diagnosis and treatment of ear disease in young children. Chemical and dietetic treatment are aspects attracting investigation even in the present state of knowledge regarding the aetiology of the disease. Chemotherapeutic successes have not yet been reported; but the work of Anderson (1939) on the treatment of measles by sulphanilamide suggested that the latter might have some value in prophylaxis against secondary gastro-enteritis

Enteritis and Otitis

Reference has already been made to the association between enteritis and otitis recorded by Cooper and, to a more striking extent, by Ebbs. Blacklock, Guthrie, and Macpherson found that the purulent exudate seen post mortem in 90% of their gastro-enteritis cases sometimes contained coliform organisms which had presumably spread from vomited material in the nasopharynx. As they also commented, however, other workers continue to submit that otitis may be primary to gastro-enteritis, and, in any case, otitis media figures prominently among parenteral conditions reported to be associated with gastro-enteritis.

The practical implications of this association may cause difficulty to administrators as well as to clinicians. Maizels and Smith reported case mortalities of 31%, 80%, and 50% respectively among their small groups of enteritis cases without ear disease, enteritis cases with surgically untreated ear disease, and enteritis cases treated surgically for ear disease. Such evidence implies that for the routine treatment of infantile gastro-enteritis outdoor medical services would require to be supported by specialist services or ample hospital accommodation.

Since streptococci and pneumococci are said to account for almost two-thirds and one-third respectively of middle-ear infections, Cleminson (1939) suggested the use of sulphapyridine on the first appearance of ear symptoms or signs of otitis in school children. The routine application to infants, however, of even such a chemotherapeutic measure will present a problem in proportion to the difficulty of recognizing the indications for treatment.

A Fatal Neonatal Outbreak

Some points mentioned above are illustrated by a series of related illnesses with terminal enteritis which occurred early in 1938 among the newborn children in the maternity unit of a Glasgow municipal hospital. Although the cases were afebrile infection was obviously at work. Seven of the 9 cases sickened during the first three days of the year, and the remaining 2 within forty-eight hours of each other towards the end of February. The ages at onset were 3 to 7 days. The recurrence of what was apparently the same infection took place despite the closure of the ward to admissions from early in January till mid-February and despite the introduction, on reopening with different nursing attendants, of linen masks for use during the handling of infants. Arrangements had also been made for the sterilization of infants' towels and clothes and for the use of an infant's towel once only.

The infection was obviously respiratory, for the resident medical officers reported that the onset had been marked by rhinitis with clear or purulent discharge. They took nasal swabs from 7 cases and, in connexion with the first group of cases, nose or throat swabs from 28 contacts, including mothers, nurses, and all infant contacts. The following findings were reported:

> Cases: *Staph. aureus*, 2; *Staph. aureus* and diphtheroids, 1; *Staph. albus* and *Strep. viridans*, 1; staphylococci and coliforms, 1. Last two cases: diphtheroids, 1; staphylococci and *M. catarrhalis*, 1.
>
> 18 adult contacts: *Staph. aureus*, 4; *Staph. albus*, 2; staphylococci and streptococci, 11; haemolytic streptococcus, 1.
>
> 10 infant contacts: *Staph aureus*, 4; staphylococci with streptococci and other organisms, 6.

One of the two cases which recovered was also one of the two cases whose nasal swab had yielded *Staph. aureus* in pure culture. Blood culture was attempted in one case, with negative result. One child, born of a syphilitic mother, showed purulent ophthalmia which yielded a staphylococcus, probably *aureus*. Associated infections in the ward were as follows: One case of maternal sepsis in mid-December and another early in January, a case of maternal mastitis early in January, two cases of infantile pemphigus in the second week of December, and an attack of *Staph. aureus* mastitis in an infant a fortnight after his recovery from the outbreak infection.

The terminal phase consisted of enteritis with loose or green stools and, in two instances, the appearance of blood and mucus. Death occurred on the second to the seventh day of illness and the enteritis had appeared one to four days after the onset. Stools were reported negative for staphylococci and streptococci as well as for dysentery and enteric. Similar cases occurring sporadically under different circumstances could understandably present themselves as clinical cases of acute primary enteritis. In the early group the only clinical features reported besides rhinitis and enteritis were loss of weight and, in one case, cyanosis. The last two cases were both fatal. One of these showed oedema of the face and scalp; the other showed hard swelling of the face and scalp, ophthalmia, and attacks of cyanosis with shallow respirations.

The infective agent was not identified nor was its source recognized. Necropsies were performed, however, in 4 of the 7 fatal cases, including the last 2, by the pathologist of Stobhill Hospital, Dr. F. E. Reynolds, and the deaths were ascribed to infection by a virus. Signs of severe toxaemia or of septicaemia were found post mortem. At one necropsy the findings included acute encephalitis and lateral ventricular haemorrhages; at two others haemorrhages of considerable size in various situations, including the peritoneal cavity, were recorded. In the remaining necropsy (Case No. 8) the diagnosis of virus infection was largely based on the clinical history and the epidemic context. Abstracts from the pathologist's reports are given hereunder.

Case No. 5.—No congenital abnormalities: peritoneum covering the structures in upper part of abdomen smeared with blood: lungs deeply congested; about the middle of small intestine, over a distance of 10 cm., mucous membrane haemorrhagic with haemorrhage into lumen, and below this flakes of blood clot mixed with the mucus-like contents of bowel; haemorrhage of some size into right adrenal gland; other organs, including brain, congested. Diagnosis: acute and severe toxaemia. Microscopical examination confirmed the above data.

Case No. 6.—No congenital abnormalities; blood vessels on the surface of the brain and those within its substance engorged; considerable subdural haemorrhage; lateral ventricles filled with dark blood clot: thoracic and abdominal organs deeply congested; Peyer's patches dark red in colour; distal 20 cm. of ileum deeply engorged and a certain amount

of blood in the lumen. Diagnosis: acute encephalitis with consequent haemorrhage into subdural space and into lateral ventricles. Microscopical examination confirmed the diagnosis of acute encephalitis.

Case No. 8.—Well-developed child without congenital abnormalities. Clear dark straw-coloured fluid in pleural cavities and pericardium. Much oedema and many petechial haemorrhages in scalp over vertex and occiput. Pial vessels congested and many petechial haemorrhages in brain substance, including cerebellum. Petechial haemorrhages below visceral pleura on each side and one below visceral pericardium. Several considerable haemorrhages into substance of each kidney. Congestion of lungs, especially bases, and of liver and spleen. Diagnosis: acute septicaemia.

Case No. 9.—Small child, born after 7½ months' pregnancy of mother with a positive blood Wassermann. Considerable haemorrhage into pericardium and into peritoneum. Patches of intense pulmonary congestion into which quite massive haemorrhages had occurred. Liver and spleen almost black from congestion but of average size. Congestion of kidneys, bladder, alimentary tract, and adrenal glands. Considerable oedema of scalp. Leptomeninges and brain intensely congested and some haemorrhage into leptomeninges. Microscopical examination: Brain—vessels congested but no cellular infiltration of perivascular sheaths; occasional small haemorrhages. Liver—blood sinusoids greatly congested. Lungs—in portions examined, alveoli and small bronchi filled with blood.

Summary

The notifiable diarrhoeal diseases have occasions of increased prevalence but "residual" average dimensions. Non-specific diarrhoea results in considerable relatively constant annual mortality, mainly among infants. Specific diarrhoea cases and enteritis deaths are usually highest in the third quarter. Enteritis deaths are regularly frequent also in the fourth quarter. In a Glasgow series of enteritis deaths nearly nine-tenths of the homes were small and four-fifths were overcrowded. The aetiological significance of these seasonal and environmental factors is discussed. Reference is also made to the advantage of segregating hospital cases of non-specific gastro-enteritis and to the practical implications of the recognized frequency of association in infants between enteritis and otitis.

In a winter outbreak of neonatal infections in a Glasgow institution 7 of 9 cases ended fatally after an afebrile illness characterized by rhinitis at onset, loss of weight, and terminal enteritis. The bacteriological findings in the noses or throats of cases and infant and adult contacts are reported. Four cases went to necropsy, and infection was ascribed to an unidentified virus. Abstracts of the pathologist's reports are given.

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O. M. Stout and R. J. Kositchek (*Arch. Derm. Syph.*, 1940, **42**, 803) report their observations on fifty-eight patients in whom pruritus was an outstanding symptom and who were treated at first with subcutaneous and later intravenous injections of 50 c.cm. of a 50% solution of dextrose. They found that the injections were of value in treatment of serum sickness, of temporary but often prolonged value in certain kinds of pruritus, and useless for pruritus in dermatitis venenata, senile pruritus, and infectious eczematoid dermatitis.

THE PROPHYLAXIS OF THROAT INFECTION

BY

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Surgeon Lieutenant, R.N.V.R.

At this time of the year there is always a sharp rise in the incidence of infections of the upper respiratory tract. This winter the conditions of overcrowding and poor ventilation which prevail in public air-raid shelters will undoubtedly prove to be another important factor in the aetiology of these diseases. Various remedies to solve the shelter problem, such as the use of aerosols to diminish air-borne bacteria, are being investigated, but it is unlikely that these will be in operation before the winter is far advanced. In the meantime some simple method of prophylaxis which can be easily applied to large numbers of people is urgently required.

The Case for Nasopharyngeal Hygiene

The throat and nasopharynx form a natural reservoir and breeding ground for many varieties of pathogenic organisms, their dissemination into the atmosphere taking place by means of the buccal spray. A recent Ministry of Health memorandum (Straker, Hill, and Lovell, 1939) on the bacteria of the nasopharynx has shown that the carrier rate of throat-borne infections is astonishingly high, up to 20% of throat swabs yielding cultures of *Strept. haemolyticus* and 20 to 60% yielding pneumococci. *Haemophilus influenzae* showed a constant carrier rate in the nasopharynx of 60 to 65%. It has also been proved that during most of the large influenza epidemics of recent years the causal virus could be isolated from throat garglings.

Local treatment of the throat and nasopharynx has been regarded with a great deal of reserve since the last war, due largely to the conflicting results obtained in attempts to eliminate the meningococcus carrier. But in view of the pathogens which inhabit the throat in both health and disease there must still be a place in prophylaxis and therapeutics for one method of local treatment—the antiseptic throat spray. For whereas the limit of effective action of the gargle is somewhere between the pillars of the fauces, the throat spray, which projects droplets of fluid direct into the throat, brings the antiseptic into contact with the pharyngeal mucosa.

The following investigation was carried out in a large naval training establishment during the 1939–40 epidemic of influenzal nasopharyngo-tracheitis with the object of estimating the prophylactic value of the antiseptic throat spray. A solution of sodium hypochlorite (15 to 20%) was chosen as the antiseptic because it combines a powerful bactericidal action with a strong oxidizing and deodorant quality.

Procedure

Two groups each of fifty naval ratings were selected from those joining the establishment for the first time. Care was taken to ensure that these two groups should live under identical conditions in the same part of the establishment and that they should perform similar duties. From the day of joining the establishment one of these groups was subjected to a daily prophylactic routine, this being omitted in the case of the other group. The routine adopted was as follows: Each morning at 6.45, immediately after assembly, the group chosen for treatment was subjected to a throat spray of 15 to 20% sodium hypochlorite solution. The instrument used for producing the spray was a portable pressure atomizer. This consists of a hand-pressure pump fitted with a spray nozzle and

made of chromium-finished metal. During use pressure in the body of the instrument was raised by means of the hand pump, the spray being controlled by a stopcock at the base. The spray was projected direct into the throat and the fluid accumulating from this was enough for a final gargle. It was found that the treatment could be carried out on a class of fifty ratings in six to seven minutes. This routine was continued daily until the time of their departure from the establishment some five weeks after joining. During these weeks any rating of either class who reported to the medical department with any complaint whatever was seen by me and his condition noted.

	Untreated Group	Treated Group
Number admitted to hospital	13 (26%)	6 (12%)
Complaint	Acute sore throat, 11; common cold, 2	Cerebrospinal meningitis, 1*; acute sore throat, 3; common cold, 2
Number attending for daily treatment	23 (46%)	12 (24%)
Complaint	Sore throat, 13; common cold, 4; suppurative otitis media, 1	Sore throat, 6; common cold, 6

* This case of cerebrospinal meningitis developed on the second day after the entry of the rating to the establishment.

By "acute sore throat" is meant acute streptococcal tonsillitis and pharyngitis, together with marked constitutional symptoms so typical of the 1939–40 epidemic. By "sore throat" is meant a subacute infection of fauces and pharynx, and "common cold" indicates acute coryza with slight constitutional symptoms but little or no throat infection.

Conclusions

The results of this investigation, which are shown in the preceding table, demonstrate clearly that during the five weeks that these two groups remained under observation the incidence of sickness occurring in the treated group was greatly diminished. The total number of patients requiring to be admitted to hospital during this period, as well as those receiving ambulant treatment, was reduced by half in the treated as compared with the untreated group. This diminution was entirely due to the decreased incidence of acute and subacute throat infections, the incidence of "common cold" being more or less equal in both groups. Clinically it was observed that the acute throat infection occurring in members of the treated group was similar in severity and in duration of illness to that occurring in members of the untreated group. This suggests that the use of prophylactic treatment failed to attenuate the virulence of the infecting organisms in those cases in which they were not primarily destroyed.

The favourable results obtained in this small experiment indicate that the use of an antiseptic throat spray is a justifiable prophylactic measure against such common winter ailments as acute and subacute streptococcal throat infections and influenza.

Summary

The incidence of pathogenic organisms in the throat is briefly discussed and a method of destroying them by antiseptic throat spray is suggested.

A comparison is given of the incidence of infection in two groups each of fifty naval ratings during a period of five weeks, only one group receiving prophylactic treatment.

The prophylaxis consisted of a throat spray and gargle of 15 to 20% sodium hypochlorite solution each morning on rising for five weeks.

It is shown that the incidence of acute and subacute throat infection in the group receiving prophylactic treatment was greatly diminished.

The severity of the clinical condition once it has developed is unaffected by the previous prophylactic treatment.

I am indebted to Surgeon Captain J. Bruce Ronaldson, R.N.V.R., for his co-operation and to Sick Berth Attendant J. L. Patterson for his assistance. My thanks are also due to Mr. H. C. Edgell of Milton Proprietary, Ltd., for the supply of sodium hypochlorite solution and pressure atomizers.

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MECHANISM OF PARTIAL REBREATHING IN ANAESTHESIA

BY

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With modern apparatus for gas-and-oxygen anaesthesia rebreathing is always provided for by the use of a bag, and CO_2 is eliminated by absorption or by the use of an expiratory valve. The former method (absorption) will not be considered here. The latter, by which a portion of each expiration is retained and a portion released into the atmosphere, constitutes "partial rebreathing," and may be applied to continuous or to intermittent flow. In either case the ultimate justification for partial rebreathing lies in the fact that the non-alveolar upper air-passages add warmth and moisture to the gases they contain, but take no part in real ventilation, so that any procedure which conserves their contents while still permitting adequate ventilation at a lower level is rational and beneficial, the more so that increased lung expansion and oxygenation are thereby occasioned.

Some Important Factors

In examining the mechanism of this process, consideration must be given to the following factors: (1) the "spirometer gradient"; (2) the total minute-flow of the anaesthetic mixture; (3) the total minute ventilation of the respiration and its relation to the gas flow; (4) the metabolic needs of the patient.

The "spirometer gradient" depends on the fact that the CO_2 content of the expired air increases until about 800 c.cm. has been released, the content then reaching a maximal value, which is taken as representing the common concentration of CO_2 in the alveolar field. The actual form of this gradient is shown in Fig. 1, and is of import-

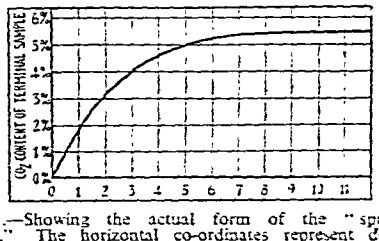


FIG. 1.—Showing the actual form of the "spirometer gradient." The horizontal co-ordinates represent depth of expiration in hundreds of c.cm.

ance in the mechanism of rebreathing. It will of course vary slightly in different individuals or from time to time in the same individual. The curve here given is based on Haldane's figures.

The extent of rebreathing is determined by the relation between respiration and gas flow. Thus if respiration amounted to 12 litres per minute, and in the meantime

6 litres of new gas had flowed into the apparatus, the difference—6 litres, or 50%—would have been rebreathed.

The effects of the process are indicated in Figs. 2–5. In Fig. 2 it is supposed that a tidal respiration of 400 c.cm. is modified by "50% rebreathing." The point

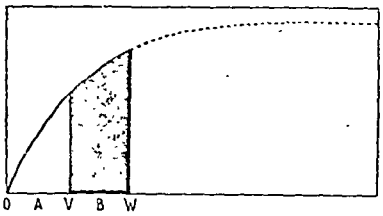


FIG. 2.—Schematic representation of 400 c.cm. tidal respiration, with 50% rebreathing. The white area enclosed under the curve at A represents the amount of CO_2 rebreathed, and the black area at B the amount of CO_2 exhaled into the atmosphere.

during expiration at which the valve opens is indicated by "V," and the end of expiration by "W." It will be seen that the upper dilute portion of the expiration, O–V, is retained for rebreathing, while the lower more concentrated portion, V–W, is released through the valve. The effective release of CO_2 is in this case performed by 200 c.cm. of deeper expiratory air. Figs. 3 and 4 make clear

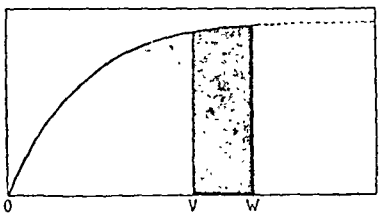


FIG. 3.—The effect of an increase in tidal respiration to 800 c.cm., with a fixed continuous flow. There is a large increase in the amount of CO_2 rebreathed, and a relatively small increase in that exhaled into the atmosphere.

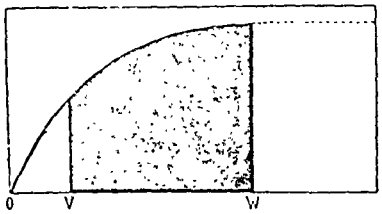


FIG. 4.—The effect of the same increase with intermittent flow. The amount rebreathed is constant, and the whole increase of tidal respiration carries CO_2 in much greater amount into the atmosphere.

the essential difference between the mechanism in continuous flow, where the volume of effective release, V–W, though movable, remains constant for a given frequency of respiration, and in intermittent flow, where it is the volume rebreathed, O–V, which remains constant.

The patient's metabolic needs must now be considered. As Guedel (1937) has pointed out, many factors tend to modify the oxygen intake and CO_2 output of the patient who reaches the operating table; but in hospital conditions these will be depressed to a minimum by resting conditions and premedication. Gesell (1939) gives for an average adult B.M.R. in the lying position an oxygen intake of 234 c.cm. per minute, representing 1.14 calories, so that if a respiratory quotient of near 1 be assumed, 250 c.cm. per minute can be regarded as a likely *maximum* for CO_2 elimination in the average adult. Now, however deeply respiration is maintained, this cannot be expired at a concentration greater than that of alveolar air, which is 5 to 6%; and if, for example, it is released in the form of a 5% mixture the real ventilation will have to be in the neighbourhood of 5 litres a minute. The volume released into the atmosphere must needs be nearly equal to the flow of gas into the apparatus; and these figures correspond with clinical experience that in using continuous-flow apparatus a gas flow of some 6 to 7 litres a minute generally ensures good results, but that if the flow is restricted much under 5 litres the patient develops signs of CO_2 accumulation.

The "Critical Flow"

This "critical flow," which if diminished is followed by CO_2 accumulation, is exactly determined in each individual by (1) his rate of elimination of CO_2, and (2) the percentage of CO_2 normal for his individual alveolar system. Since in Figs. 2, 3, and 5 the "effective release," V–W, remains constant, respiratory adjustment will take place by a shift of this fixed line to right or left, and a consequent alteration in the height of the black column and the area contained by it, which represents CO_2. It will be seen that there is a limit to the effectiveness of hyperpnoea, indicated in Fig. 5, and if this "limiting

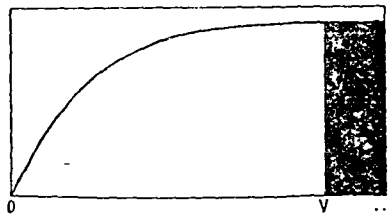


FIG. 5.—The "limiting value" with continuous flow. No matter how far the curve is produced to the right (by increased depth of respiration) the black area will not increase.

value" of CO_2 release does not account for all the CO_2 liberated in the alveoli the latter will begin to accumulate. Altered frequency of respiration will accomplish nothing, for the volume V–W is equal to the gas flow divided by the frequency, and will become contracted in inverse proportion to the latter, so that no increase in total elimination over a given period will result.

It will be seen that in partial rebreathing with continuous flow the natural respiratory mechanism is considerably modified by the apparatus to which the patient is connected. The ventilation per minute is arbitrarily limited, and the patient's efforts to modify it alter only the *depth* within the respiratory system at which the fixed ventilation takes place, this depth being *mechanically* limited by the maximum tidal exchange of which he is capable, but *physiologically* limited by the depth (about 800 c.cm.) of respiration after which no further increase in CO_2 percentage occurs.

This is in contrast to conditions prevailing in normal repiration or open anaesthesia, where increased respiratory movements at once increase both the depth and volume of real ventilation. It is also in contrast to the means of rebreathing employed in the intermittent-flow machine (for example, McKesson), in which it is the volume to be rebreathed which is arbitrarily set beforehand, and in which hyperpnoea causes an immediate increase in real ventilation, by drawing on an increased flow of gases. In this latter method the design of the bag is important. With continuous flow it matters not for this purpose how large the bag is, for it will expand sufficiently to operate the valve, and thereafter contract only by the amount of rebreathing determined by the relation between respiration and gas flow. In an intermittent-flow machine working without pressure, however, the patient must empty the bag entirely before he can draw on new gas; and provision must therefore be made for limiting its capacity to a known small amount.

Conclusions

Partial rebreathing is justified in so far as it promotes lung-expansion and oxygenation, and retains the warmth and moisture of the upper respiratory contents while permitting adequate ventilation below.

Its extent is modified in the continuous-flow machine by adjustment of the gas flow, and in the intermittent-flow machine by adjustment of the bag capacity.

The patient's effective alveolar ventilation is controlled, as always, by the alveolar CO_2 concentration.

For continuous-flow machines there is a "critical flow" in the neighbourhood of 5 litres per minute for each individual, which if diminished will lead to CO_2 accumulation, but which if exceeded allows equilibrium to be attained.

Continuous flow is dangerous with a flow below the critical level; intermittent flow is dangerous with an unlimited bag capacity.

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LAURENCE-MOON-BIEDL SYNDROME, WITH TETANY

BY

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AND

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The following interesting case, considered to be an example of the Laurence-Moon-Biedl syndrome without polydactyly or mental deficiency, seems to merit publication.

Case History

A young woman aged 25 was admitted to Westminster Hospital in October, 1938. Her immediate complaint was of pain in the left loin that had been present for a week. The features which had actually led to her admission were blindness—present from birth—and attacks of tetany. These attacks dated from the age of 10, and had been occasional until nine months before. From that time they became more frequent, and just before her admission were occurring about twice a week. During the last two years she had also complained of pain in her back, for which she had been given a spinal jacket at another hospital. A report from this hospital stated that radiographs of the bones seemed normal. There was no history of vomiting. She had at one time been rather fat: with the onset of tetany she had gone to the opposite extreme, but recently she had returned more or less to normal. Her menstruation had been irregular and infrequent from the onset at 11, but the intervals had steadily increased from the minimum of three months, her last period having taken place four years ago. A further sixteen sibs of this patient had been born, of whom only five are now alive. Four of these sixteen were blind at birth, and only one is living. No abnormal fatness, tetany, or mental deficiency had affected any sibs: a sister with unaffected vision, however, had had six toes on either foot—she died early in life. The mother suffered from diabetes, but otherwise she and the father were healthy; they were unrelated.

A number of typical attacks of tetany with carpo-pedal and facial spasm were observed during the patient's stay in hospital. Chvostek's and Trousseau's signs were positive and could be elicited at any time with ease. Her veins were abnormally irritable; none were visible and no blood could be obtained from any of them, not even after cutting down and exposing them, as they went into intense spasm on the prick of the needle. Eventually blood had to be taken by needle from the femoral artery. The nursing staff had not observed any hyperpnoea. Mr. E. F. King examined the patient's eyes, and important findings are as follows: No light perception; pupils inactive to light; posterior cortical complicated cataracts; both retinae show gross primary degeneration with secondary narrowing of the retinal vessels and optic atrophy. "The picture is somewhat like retinitis pigmentosa, though the size and distribution of the pigmentation are not typical, and of course the history of blindness from birth is atypical." The patient was plump but hardly obese; polydactyly was not present. Her breast development and hair distribution were healthy. She appeared quite intelligent. She was tender in both loins and the urine contained albumin.

Special investigations gave results as follows: Serum calcium 9.2 mg., 10.9 mg., and 9.3 mg. per 100 c.cm.; plasma phosphorus 3.8 mg. and 4.2 mg. per 100 c.cm.; serum phosphatase 11 units; alkali reserve 61 c.cm. carbon dioxide %; blood urea 19 mg. per 100 c.cm. Radiographs of lumbar and dorsal spine disclosed nothing abnormal. The urine contained *B. coli*. An intravenous pyelography failed to reveal abnormality. The basal metabolic rate was −14%. The glucose-tolerance curve was normal, and the Wassermann and Kahn reactions were negative. A full blood count was normal.

The patient was put on three-quarters of an ounce of calcium lactate and 50,000 international units of vitamin D daily. Dr. G. A. Tuck, her medical practitioner, reports that she is greatly improved and that she has had only one attack of tetany in the last three months. It is interesting that her veins are now readily visible.

Discussion

Both the cause of the tetany and the diagnosis of the case are obscure. The investigations appear to rule out any of the accepted causes of tetany. An explanation was somewhat tentatively advanced by Dr. Raymond Greene. It runs as follows:

"Obesity has been present at one time: this and the amenorrhoea might be of pituitary or hypothalamic origin. A parathyrotrophic hormone is to be found in the pituitary. The increasing intervals between the periods and the variation in the obesity suggest an alteration in the level of pituitary secretion over a period of years. If the secretion of the parathyrotrophic hormone at some earlier time was high but has now sunk to normal levels (as indicated by present normal blood calcium and phosphorus figures) then it is possible that the tetany of this case is a consequence of the body's failure to adapt itself, as yet, to the relatively low calcium level."

The result of treatment with calcium and vitamin D supports an explanation along some such lines. No other hypothesis has been suggested.

We believe this case to be an example of the Laurence-Moon-Biedl syndrome. Admittedly polydactyly and mental deficiency are absent, but this has been so in other accepted cases. The absence of obesity *is* unusual, though Cockayne and co-workers (1935, 1939) have found records of this in a few cases; further, obesity was at one time present in this case. The menstrual disturbance supports the diagnosis. The obesity and amenorrhoea of the syndrome have usually been taken to indicate a pituitary or hypothalamic lesion. A lesion of such a nature in this case is further suggested by the tetany. Cockayne, Krestin, and Sorsby (1935) say, in connexion with atypical retinitis pigmentosa in this disease, that "typical retinitis pigmentosa would appear to be the exception." The affection of four other sibs, the parents being unaffected, is suggestive of a recessive mode of inheritance, and this is consistent with what is known of the syndrome (Cockayne and co-workers, 1935, 1939). The appearance of poly-

dactyly in another otherwise unaffected sib is significant and also rather typical (Cockayne and co-workers, 1935, 1939).

No other diagnosis has been advanced.

This case is described by the courtesy of Mr. G. T. Mullally, under whose care it was.

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Clinical Memoranda

A Suspected Case of Chronic Meningococcal Septicaemia

Details of the following case are submitted because it is felt that the diagnosis of chronic meningococcal septicaemia is easy if the condition is borne in mind, and because, with the present high incidence of cerebrospinal fever, there must be many cases which pass unrecognized.

Chronic meningococcal septicaemia was originally reported by Saloman (1902), and it has since been seen in increasing numbers on the Continent and in America. The only case reported in England since Stewart-Wallace (1936) recorded 3 from the London Hospital was that by Dimson (1938), which was treated with sulphapyridine. Stott and Copeman (1940) analysed seventeen cases out of a total of twenty-seven which they had seen among members of the B.E.F. in France. Stott (private communication) saw a considerable number more after the paper had gone to press, but had not seen any in this country. As pointed out by Appelbaum (1939), the condition occurs among both sexes and in all age groups. It is common before and after an epidemic of cerebrospinal fever, and is often ushered in by an acute tonsillitis or other upper respiratory infection.

CASE HISTORY

The patient was a previously healthy soldier aged 24 who had never been out of the country. He was admitted to hospital on September 5, complaining of sore throat and fever. His temperature that night was 103° and his pulse 108; his throat was red and injected. A throat swab yielded an abundant growth of haemolytic streptococci. By the following day his temperature was normal, and he made an uninterrupted recovery; so much so that he was due for discharge from hospital on September 12, when he had his first bout of fever.

On the evening of the 12th he retired to bed with a temperature of 103°, sweated, felt cold, and said that his head ached. On the following morning his temperature was normal, but a crop of spots was noticed on his legs, arms, and back. These spots were hard, raised, macular, and tender, and recurred in crops; they resembled slightly those seen in erythema nodosum. His temperature rose again on the evening of the 13th, but by the following morning was again normal: the cutaneous eruption had faded, leaving slight brownish pigmentation. On the 15th, 18th, 21st, 25th, and 26th his evening temperature rose to 102–104°, his pulse rate rarely reached 100 and never exceeded 120. A fresh crop of spots appeared with each bout of pyrexia and faded in about thirty-six hours. At no time did the patient feel ill, he was not clinically anaemic, and the spleen was not palpable.

A radiograph of the sinuses on September 11 revealed slight clouding of both antra, suggesting catarrh. A radiograph of the chest on September 20 showed the lungs to be clear. Blood cultures on the 21st, 25th, and 27th were sterile. Examination of a film of blood on the 25th revealed no malarial parasites, and the blood Wassermann reaction was negative.

A full course of sulphapyridine was begun on the 27th, and thereafter the temperature remained subnormal. The patient was discharged from hospital on October 8.

This case is interesting from the point of view of the diagnosis. Chronic meningococcal septicaemia is probably commoner than is supposed, and may become increasingly so because of the high incidence of cerebrospinal fever which has been maintained throughout the year. Its clinical recognition should be simple, according to Stott and Copeman (1940): pyrexia, associated with a relatively slow pulse, a cutaneous eruption which may be pleomorphic but is often similar to that of erythema nodosum, and the absence of malaise, wasting, and anaemia are the main points which they stress. Blood cultures in the above case were negative, and in Stott and Copeman's series there were only six positives. Cerebrospinal fluid is always normal in the uncomplicated cases. Response to sulphapyridine is immediate.

The focus of infection is as yet unknown, but it is possible that sinus infection plays a part. Rolleston (1919) quoted a case with antral infection, but pus obtained by puncture did not yield meningococci. In my case the antra were cloudy, but, as this was attributed to catarrh, puncture was not carried out.

I am indebted to Dr. L. C. Martin, physician to the hospital, for permission to publish the details of this case, which was under his care, and for help in preparation. Also to Colonel A. W. Stott, R.A.M.C., consulting physician to the Forces, for help in the final diagnosis of the case.

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The Pectoralis Major for Intramuscular Injections

The buttock, though universally recommended, has many drawbacks as a recipient of intramuscular injections. The fat-screen is variable and often massive; the marks and guides are indefinite; there are large veins, arteries, and nerves within reach (I have more than once known the sciatic nerve injected); if tenderness develops from the injection, walking, standing, sitting, and even lying down are painful. The region is apt to have unaesthetic associations, there is often hesitation in giving sufficient exposure, and falls of drapery may be embarrassing. These considerations many years ago impelled me to seek another site, and the edge of the pectoralis major was chosen; it has been used almost exclusively since, and no drawbacks have been found.

The doctor stands at the side of the patient, preferably the left. Men patients remove their shirt from that shoulder; women may usually retain their underclothes if these have fairly large armholes. The patient raises the arm sideways to a right angle; resting the hand on the doctor's right shoulder often gives confidence, and the slight pull on the arm brings the edge of the pectoralis major into prominence. After cleaning the skin with antiseptic the doctor's left thumb is placed on the axillary side of the muscle and his forefinger in front of it; the edge of the muscle is thus grasped, and a little pressure will make it tense and facilitate the puncture. The needle is inserted parallel with the shoulders and with the anterior surface of the muscle, between the thumb and finger, which serve as guides.

It is easy to direct the needle into the muscle with precision, and its penetration can be felt. There is little fat in the way, there are no large vessels or nerves in the neighbourhood, and it is not very sensitive. Ten c.cm. is accommodated with ease, 20 c.cm. is well tolerated, and absorption is rapid. The same site can be used repeatedly, though it is easy to choose different parts of the muscle. Bismuth and other opaque injections can easily be observed with *x* rays, and their absorption so watched. Pain or tenderness is rare; even with irritating materials they appear to be less frequent than in the buttock, possibly because extra-muscular injection is less often achieved. If tenderness should develop the left arm can usually be rested or even placed in a sling.

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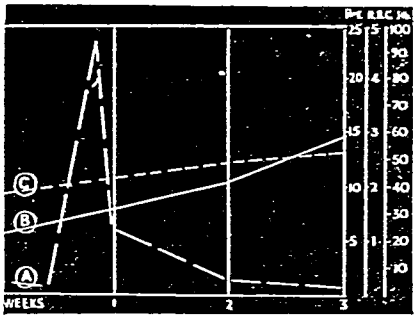
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Reviews

THE KIDNEY IN CHRONIC BRIGHT'S DISEASE

Architecture of the Kidney in Chronic Bright's Disease. By Jean Oliver. (Pp. 257; illustrated. $10.00. New York: Paul B. Hoeber.

In a remarkable book Dr. Jean Oliver here states the results of his continued pathological researches on chronic disease of the kidney, which were begun in collaboration with Dr. T. Addis's clinical work in their attempt to elucidate the renal lesion of Bright's disease and correlate the bedside and post-mortem findings. The great advance he has made in dealing with the problems involved is in utilizing two methods which allow demonstration of the tubules of the kidney in three-dimensional form. The first is in tearing out and isolating the tubule from surrounding tissues that have been previously macerated by a reagent; concentrated hydrochloric acid at room temperature for one or two days after fixation with 10% formalin was used. The second procedure is reconstruction in plastic wax from serial sections. The kidneys used for these studies are from the material of the earlier investigation, so that already much clinical and pathological data had been accumulated, and the present work is an objective description of the results.

The architectural unit of the kidney is the nephron, an elemental structure that includes the glomerulus and tubule to the point of its entrance into the common collecting system. The simplest modifications are increase or decrease in size, and these variations, hypertrophied and atrophied nephrons, occur in disease. In the atrophic tubule there is decrease in tubule diameter associated with loss of complexity, straightening, and shortening. The hypertrophied tubule shows increase in diameter and in its length, the result being an increase to as much as ten times the volume of a normal nephron. It would be difficult to deny the likelihood that the functional ability of the atrophied tubule is decreased, but more exact knowledge is needed before drawing conclusions as to the significance of the hypertrophied nephrons as regards function. It is shown that it is principally the terminal part of the proximal convolution which is affected. The blood supply to this part has largely been shunted straight into the efferent vessel by enlargement of Ludwig's vessel without having undergone change by passage through the glomerular mechanism, for in these hypertrophied tubules the glomerulus is disproportionately small. Moreover, in many instances of chronic Bright's disease there is obliteration of the glomerulus without their necessarily being destruction of the whole nephron, and it is probable that these aglomerular nephrons are capable of function. There are certain new elements, portions of tubules forming completely closed vesicles, but no new-formed tubules or bud-like outgrowths could be demonstrated.

Discussing the pathology of chronic Bright's disease Dr. Oliver discounts the effect of glomerular destruction in causing tubular atrophy. Regressive changes of the nephron follow sclerosis of the arteries of the kidney: but these changes may be considered a part of the life-history of the organ, the evidences of senile involution. On top of this, interstitial inflammatory reaction appears to be a considerable factor in the production of alterations in the architecture of the kidney in Bright's disease. In some instances, when death occurs early in the course of the disease, the inflammatory processes in glomeruli and interstitial tissue may be only incipient, and it is easy to understand that such kidneys, if the patient survives, should recover their normal organ structure. In more protracted cases it is possible to group the appearances into two classes which differ fundamentally: in the first group regressive changes take place; in the second, besides the regressive changes of nephron atrophy and hydronephrotic destruction, there are added progressive alterations of hypertrophy and hyperplasia. The author believes that in the regressive form "the renal lesion proceeds uninterruptedly at a level of intensity sufficient at last to preclude the development of progressive and adaptive change. In the adaptive type, though at times the intensity of the renal lesion may be high, there are periods of remission so that vessel new-growth and the changes of hypertrophy and hyperplasia can occur." Following the contraction of inflammatory interstitial tissue, scarring may produce tubular atrophy and at times tubular hydronephrosis.

There appears to be an alteration from the normal predominantly glomerular function towards a condition of increased tubular elimination. This conclusion is formed not only on the demonstration of aglomerular nephrons but also on the blood supply being changed to a more direct tubular supply. Further, the different forms of Bright's disease, whether primarily characterized by glomerular inflammation, amyloid degeneration, or arteriosclerosis, may present kidneys in the final result remarkably similar. Further work on the lines described in Dr. Oliver's book should enable the physician and pathologist to meet with greater understanding each other's problems and to obtain a clearer view of the structure and function of the kidney in chronic Bright's disease.

MODERN DRUGS

Modern Drugs in General Practice. By Ethel Browning, M.D., Ch.B. (Pp. 236. 10s. 6d. net.) London: Edward Arnold and Co.

The rapid increase in the number of powerful therapeutic agents which the labours of the organic chemist have put at the disposal of the medical profession creates a real demand for such a book as Dr. Ethel Browning's *Modern Drugs in General Practice*. Any drug with a powerful therapeutic effect must also be toxic if not used with discrimination, and in these pages the general practitioner will find just the kind of information he requires. Naturally the great triumph of chemotherapy—the sulphonamide group—is given pride of place, and we note two interesting observations under that head. One is the curious liability of sufferers from rheumatic affections to develop two of the rarest and most severe effects of sulphonamide toxicity—agranulocytosis and encephalomyelitis. The other is the point urged in favour of combining treatment by antisera with sulphapyridine in pneumonia—that the bacteriostatic effect of the latter does not have to wait for the specific antibodies to develop before the cure can be completed. Gold therapy is next critically discussed, and the conclusion is reached that active rheumatoid arthritis is the only really satisfactory indication for its employment. (We should have liked to see Forrestier's name in the references on this point.) Then cardiac drugs are considered, including digitalis, which, though by no means a modern drug, has undergone modern developments. Here we are surprised to find no mention of the influence of digitalis on conductivity. Indeed, the whole section on the effects of digitalis and quinidine in auricular fibrillation lacks precision. Coramine and metrazol are dealt with adequately, as are the barbiturates, though not all would agree with the statement that prominal is more effective in grand mal than in petit mal. The arrangement of the chapter on drugs acting on the autonomic nervous system under Dale's classification of cholinergic and adrenergic is admirable: it will be very helpful to those practitioners

whose physiology is of an earlier date and who consequently may find the modern conceptions obscure. The remaining sections deal with such topics as hypnotics, urinary antiseptics, gastro-intestinal remedies, and external applications, including local anaesthetics. The practitioner will find this book an excellent adjunct to his library, and we expect it will reside on his desk rather than on his bookshelf.

CRIME BETWEEN THE WARS

Social Aspects of Crime in England between the Wars. By Dr. Hermann Mannheim. (Pp. 382. 18s. net.) London: George Allen and Unwin Ltd. 1940.

This book originated in the author's belief that there existed a noticeable gap in criminological and penological research which might profitably be filled by a study of the history of crime, its causes and treatment, in England during the last quarter of a century. He felt that only then had the time arrived for a detached assessment of the criminological implications of the war of 1914–18 and the period which immediately succeeded it, and for an examination of the practical working of the machinery created by the progressive legislation of the beginning of the century. His plan had to be modified in some ways, particularly by reshaping his survey of juvenile delinquency to avoid overlapping with the extensive research which had been started by the authorities. He first examines critically the structure and interpretation of English criminal statistics. He candidly recommends the non-technical reader to skip this lengthy section, but its place is obvious. It would be unsound to ask readers to accept conclusions based upon such an uncertain foundation as the English criminal statistics without a detailed study of their weak spots. He deals in separate chapters with the most significant aspects of the period between the wars, such as unemployment and strikes, business administration, alcoholism, and gambling, and with those aspects of crime which are associated with specific sections of the population, such as juvenile delinquency, prostitution, and recidivism. He has had the advantage of the support of the Leon Bequest Committee of the University of London, and has been able to use a large amount of official material. This is a real professional textbook, full of illuminating fact, in which experts in the study of every branch of crime will find much instruction.

THORACOPLASTY

La Thoracoplastie Élective: Primitive—d'Association—de Substitution. By J. Angirany, L. Michon, and A. de Micheaux. Preface by de F. Dumarest. (Pp. 128; 28 plates. $1.35.) Paris: Masson et Cie. 1940.

Most tuberculosis workers will agree with Dr. Dumarest that the enormous progress made in the treatment of pulmonary tuberculosis, particularly during the past ten years, is largely due to the development of a "symbiosis" between tuberculosis physician and surgeon. This monograph, written by a surgeon and two physicians, is based on four years' such collaborative work at one of the sanatoria at Hauteville, and reflects the modern tendency to confine the field of operation in thoracoplasty to the minimum required to obtain the maximum beneficial effect on the lesion; the extent and type of rib resection, including the surgical approach and number of stages, being planned beforehand to suit each case. Indeed, the authors have nothing good to say about total thoracoplasty—"everything must be done to avoid it," a complementary phrenicectomy being preferable where a total thoracoplasty seems indicated.

Though written almost in note form the book is very readable. Essentially an account of personal experience, it nevertheless contains references to other workers, particularly in the first chapter, on the evolution of the ideas on thoracoplasty; and there is a useful bibliography. The case reports are excellently illustrated. The indications are clearly set out. They are classified as general indications (good, borderline, poor) for thoracoplasty *d'emblée* or *primitive*; as those for complementary thoracoplasties (*d'association*), when the operation supplements a phrenicectomy, a contralateral pneumothorax, or a partially effective pneumothorax; and as indictions for thoracoplasty *de substitution*, when it is carried out because an intrapleural or extrapleural pneumothorax has proved ineffective. The authors stress the importance of normal tissue all round the cavity in obtaining a really good result, and the influence of this fact on the planning of the operation.

There is a good chapter on anaesthesia, in which the role of premedication is emphasized. The section on technique is detailed, but suffers from absence of illustrations. The final sections, on "results," are concerned mainly with complications (inadequately discussed) and sequelae, including effects on the skeleton, but no actual results are given except the figure of 2% as the immediate operative mortality. And there is nowhere in the book any indication of the number of patients on whom the authors have operated. The monograph will be found useful by tuberculosis physicians who wish to have more than a nodding acquaintance with details of surgical interventions.

HISTOLOGY

Bailey's Textbook of Histology. Edited by Philip E. Smith, Ph.D., Russell L. Carpenter, Ph.D., Charles M. Goss, M.D., Wilfred M. Copenhaver, Ph.D., and Aura E. Severinghaus, Ph.D. Tenth edition. (Pp. 764; 448 illustrations, many in colour. 33s. net.) London: Baillière, Tindall and Cox. 1940.

A Textbook of Histology. By Harvey Ernest Jordan, A.M., Ph.D. Eighth edition. (Pp. 690; illustrated. 35s. net.) New York and London: D. Appleton-Century Company, Inc.

Each of these new editions of two well-known American textbooks on histology has certain special characteristics which distinguish the one from the other, while at the same time they possess many points in common. Among the latter are: the width of scope and diversity of the subject-matter, which has been systematically dealt with and described in detail; the general excellence of the illustrations, many of which are colour plates; and an endeavour to record the results of a vast amount of recent research work on general and experimental human histology in book form, so that it is easily accessible to the ordinary reader. The two volumes differ in that the one is the combined work of five authors, whereas the other may be considered as the life's work of a single individual who has devoted his whole energy to the study of human histology. Each method has advantages over the other. The co-operative method, represented by *Bailey's Histology*, is perhaps best suited for research workers and authors as a book of reference; whereas the work of a single author, exemplified by Jordan's *Histology*, is more likely to bear the hall-mark of individuality and be preferred by a reader approaching the subject for the first time.

Although references to the clinical bearing of certain facts of histology might be considered as outside the scope of a work on microscopical anatomy, yet, as textbooks on human histology are mainly written for the use of students of medicine, such references are of great value and add to the interest of the description. A good example of this is found in the pioneer work on the structure and formation of bone, which was largely carried out by or at the instigation of British and French surgeons, who

combined their own clinical observations with experimental and histological research. These earlier works are so fundamental that no account of bone formation or of its repair can be considered as historically complete without some reference to them. Fuller references to foreign literature, more especially to the German, Spanish, and Italian work on the central nervous system, are desirable; the two books, however, may be regarded as containing all the more essential facts of human histology, and may confidently be recommended for the use of both junior and advanced students of that subject.

Notes on Books

In *Haemophilia and Egg-white Derivatives* Dr. W. A. TIMPERLEY makes a full statement of his claim that a substance which can be extracted from egg-white reduces the clotting-time and arrests haemorrhage in haemophilia. This compilation consists largely of case-histories, but the method of preparing the extract and other technical procedures are briefly described. The theoretical argument which led to the adoption of this method is far from clear, and the reader of the brochure will probably feel that the various effects claimed for egg-white derivatives—for there are several—must be classed as empirical, even supposing that they are accepted as constant and regularly reproducible. Copies, price 6s. 6d., can be obtained from Dr. Timperley, 4, Blackmoor Crescent, Norton, Sheffield, or through Messrs. Jowett and Sowry of Leeds.

The seventy-third annual volume of *Whitaker's Almanack*, for 1941, has now appeared in three forms—at 15s. and at 10s., and an abridged edition, with paper covers, at 5s. Like many other persons, publications, and institutions *Whitaker* has not escaped war damage. Publication was postponed because bombs blasted its printers while the book was being machined, and then the home from which it had been issued for nearly three-quarters of a century was destroyed in the second Fire of London. The events of the war are chronicled in this edition, and the new departments that have been set up occupy many pages.

The Pharmacology and Therapeutics of the Materia Medica, by Prof. W. J. DILLING, is the sixteenth edition of the textbook originally written by Dr. J. Mitchell Bruce and afterwards edited jointly by Bruce and Dilling. The general arrangement has been preserved, and the text has now been brought up to date once more so as to contain accounts of all the drugs currently accepted and widely used as therapeutic agents. Important drugs of recent introduction are described, also others that promise to be of value. This edition employs the official pharmacopoeial names for drugs hitherto referred to under trade names. The book is published by Cassell and Co. at 12s.

Preparations and Appliances

ANAESTHETIST'S SLIDE RULE

Dr. WILLIAM W. MUSHIN (Honorary Anaesthetist, Seamen's Hospital, Greenwich) writes:

The anaesthetist is more interested, from a physiological and record-keeping point of view, in the qualitative composition of the gas mixture his patient is breathing than in the actual volumes of each gas delivered per minute. The intermittent-flow machines, such as the McKesson and the Walton, are calibrated qualitatively, and the percentage of each gas can be read off directly. In contrast to this the continuous-flow type of machine, exemplified by the Connell, the Foregger, and the Boyle, which has been supplied by the Government throughout the country, is fitted with flowmeters which indicate the volume flow of each gas in unit time. The anaesthetist using these machines must himself calculate the percentage composition of the mixture from these flow rates, and this calculation has to be repeated whenever the flow of any of the gases is altered. When only two gases are being used and the figures are simple, the calculation is an easy mental one. However, with more than two gases and with fractional rates of flow a mechanical calculator has proved of great value, and has made the visualization of the qualitative changes in mixture easy.

A simple calibrator has been devised which makes easy this conversion of the quantitative reading of gas flow given by the flowmeters into a qualitative form. It also indicates what flow rates will be required to produce a mixture of desired composition. The scales are logarithmic, the figures representing the logarithm of the number indicated. The principle is therefore that of the engineer's log.-log. slide rule. The calculation desired is solved by the equation:

$$\frac{\text{Volume of gas A in litres per min. } (V_a)}{\text{Total volume of gases in litres per min. } (V_t)} \times 100 = \text{Percentage of gas A in mixture } (P_a)$$

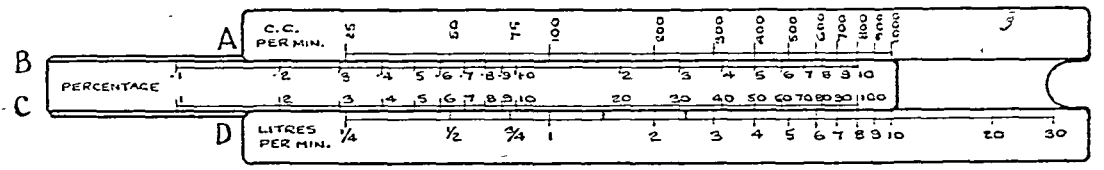
or, in logarithmic form:

$$\log 100 - \log V_t \div \log V_a = \log P_a$$

The equation has thus been reduced to a simple one of addition and subtraction, and the answer can be read off on the slide rule with accuracy.

Use of the Instrument.—The anaesthetist's slide rule consists of two fixed scales, A and D, for the gas-flow rates, and two sliding scales, B and C, for the percentage figures (see illustration). For average use scales C and D only are required. Scales A and B are employed when very slow rates of flow—under one litre per minute—are being used, such as with basal oxygen and cyclopropane. The slide is adjusted so that the 100 mark on scale C (marked in red on the instrument) is exactly opposite the figure for the total volume of gases on scale D. The percentage of any gas in the mixture is read off on scale C opposite the volume-flow rate for that gas in scale D. The calculation $\log 100 - \log V_t - \log V_a$ has been performed in that order, and the answer is found in scale C.

Examples.—(1) 6 litres of N_2O, 1½ litres O_2, and ½ litre of CO_2 are indicated on the machine. What is the percentage composition of the mixture? Total volume of gases per minute = 8 litres. Move the slide till the 100 mark in red is opposite 8 litres (as in illustration). The figure 6 is opposite 75, which is the percentage of N_2O; 1½ is opposite 18¾, which is the oxygen percentage; and similarly the CO_2 is just over 6%. (2) 6 litres of N_2O are flowing. What flow rate of oxygen is required to give 25%? (Simple figures have been chosen so that the illustration can be used to follow this example.) The N_2O percentage is therefore 75. The figure 75 on the percentage scale C is brought opposite 6 litres on scale D. The oxygen flow required is read under the figure 25, and is 2 litres per minute.



This anaesthetist's slide rule has been beautifully made for me by the British Oxygen Co., Ltd., Wembley, Middlesex, who propose to issue it as part of the equipment of the Boyle machine. My thanks are due to Mr. G. F. Arcus, their technical adviser, for his help and valuable suggestions.

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ANTISEPTIC SNUFFS

It is a truism that the control of air-borne infections has lagged far behind other forms of progress in hygiene. Water, food, and animals as sources of infection we know how to tackle, but aerial spread—which is responsible for a greater number of diseases than any other—continues almost unabated. More spacious buildings and better ventilation have doubtless improved matters, as have the detection and isolation of carriers as well as cases of certain infectious diseases, but widespread epidemics of influenza still testify almost every year to our powerlessness in the face of atmospheric contamination. The exigencies of war have called forth an active interest in this subject, and proposals are afoot for disinfecting air by chemical or physical means and for laying infected dust.

Where infections of the air passages are concerned an alternative is some measure of individual protection, but face masks, besides being unsightly and inconvenient, are known rather to protect other people against infection from the wearer than vice versa. That an antiseptic could be used for this purpose will have presented itself as a serious proposition to few people, in spite of the widespread use of lozenges and tablets, gargles and sprays, with the ostensible object of killing micro-organisms in the throat and nose. The efficacy of such measures is singularly ill supported, and the continuity of action necessary for prevention as distinct from cure can clearly not be secured by most of them. Nevertheless, Prof. M. E. Delafield, Dr. Edith Straker, and Prof. W. W. C. Topley, whose paper appears at page 145 of this issue of the *Journal*, have entered this apparently unpromising field and made observations which will arouse widespread interest. They speedily concluded that persistent antisepsis in the throat is an impossibility, and that attention must be directed to the nose. Here an antiseptic in finely particulate form can be widely distributed by taking it as a snuff: indeed, its distribution will be similar to that of inhaled bacteria. The clearing of secretion from the nose is much more leisurely than the corresponding process in the throat, and slow solution of an antiseptic introduced in solid form should add to the persistence of its action. A technique had to be devised for estimating the effects of this proceeding, and the quantitative method of cultivating swabs which was eventually adopted may well serve as a model for future observations in this field, where adjectives such as "profuse" and "scanty" applied to the growths obtained in culture are usually the nearest approach to any estimate of bacterial numbers. Where abnormal secretion is obtainable in bulk it would of course be possible to advance on this method by making a suspension from a measured volume, thus eliminating the main variable—which is the quantity of secretion removed by the swab. The effect of antiseptic snuffs was judged by the diminution in numbers of bacteria previously present, and noses whose secretion contained numerous staphylococci furnished the best subjects for experiment. Snuffs containing proflavine, penicillin, and sulphathiazole all caused a decided diminution in the numbers of staphylococci; proflavine was less regular in its effect, and staining is a serious aesthetic objection to its use. In several cases a diphtheroid bacillus disappeared rapidly and completely during treatment with sulphathiazole snuff.

These observations are only of a preliminary nature, and it will be interesting to see where they lead. It is fortunate that two antiseptics have at once been identified which not only secure an effect but are calculated to do no harm to the nasal mucosa. The ciliated epithelium of the nose is a delicate and valuable structure, constantly at work in the disposal of inhaled bacteria; the cinematographic demonstration of its activity, and of the impairment or cessation of this activity when even weak antiseptics are applied, given some years ago to the Section of Oto-rhino-laryngology of the Royal Society of Medicine must have convinced everyone who saw it that to tamper with this mechanism is something not lightly to be undertaken. A recent attempt at prophylaxis by antiseptic treatment of the nose must certainly have caused severe damage: this is the use of astringents (tannic acid, picric acid, alum, zinc sulphate) for tanning the nasal mucosa and so rendering it impermeable to the virus of poliomyelitis, a practice advocated in the U.S.A.[1-5] The choice of really innocuous antiseptics is small: another possible one is the bacterial extract studied by Dubos,[6] which has a remarkable action *in vivo* as well as *in vitro* on Gram-positive cocci, especially pneumococci. This substance and penicillin, which is of similar origin, have no action at all on many Gram-negative bacteria; according to the purpose for which nasal antiseptics are employed, these peculiarities in selective action will have to be borne in mind.

The main question at the moment is whether this form of treatment is going to be adopted as a means of prophylaxis—the original intention of its authors—or whether it is to be applied to the treatment of established nasal infections. The laryngologist will not be slow to adopt so novel and simple a treatment sponsored, however guardedly, by such authorities. Let us hope that he will not be disappointed, and let us hope also that careful studies may be made in order to decide what the treatment is capable of doing. The nasal diphtheria carrier—if he is old enough to learn how to take snuff—is a well-defined subject for attack; the meningococcus carrier and the sufferer from nasal catarrh due to a known and susceptible micro-organism are others. But let it not be lightly assumed that the inflamed mucosa will respond in the same way as the normal; that a profuse and purulent or inspissated secretion is as

[1] *J. exp. Med.*, 1936, **63**, 877.
[2] *U.S. publ. Hlth. Rep.*, 1936, **51**, 1105.
[3] *Amer. J. publ. Hlth.*, 1937, **27**, 103
[4] *Canad. publ. Hlth. J.*, 1937, **28**, 493.
[5] *British Medical Journal*, 1938, **1**, 953.
[6] *J. exp. Med.*, 1939, **70**, 1, 11, 249.

favourable a menstruum for this effect as normal mucus, or that the various sinuses are as accessible to it as the main cavity of the nose. All these things remain to be found out if this form of treatment is to receive further serious study. It has further to be borne in mind that prophylaxis and treatment are very different things where an antiseptic is concerned: of the two, the former is the more likely to succeed. If either does so, it will be an unexpected achievement for a type of proceeding which it has long been customary to regard with scepticism and even contempt.

DOCTORS AND THE PURCHASE TAX

"Muddle" is not too harsh a word to describe the administration of the purchase tax so far as drugs and medicinal preparations are concerned. The situation changes almost from week to week with successive amendments issued by the Commissioners of Customs and Excise. On calling at the Customs House our representative was handed the Notice (No. 78) setting out what goods are chargeable with tax, but it was accompanied by two addenda cancelling or amending certain of the lists, and he was informed that even then the revision was not up to date. It seems improbable that any printed memorandum can ever be up to date. The continual amendments create an embarrassing position for the drug manufacturing concerns, which are having to refund tax already charged on articles newly exempted or to charge tax on articles which have been brought retrospectively under the Act. The trouble seems to arise from the fact that the tax is administered by civil servants with no real knowledge of drugs. No pharmacist is responsible, and there is no pharmaceutical control over the incidence of the tax or the choice of preparations for chargeability or exemption. Certain articles are not taxable if supplied by wholesale drug houses to chemists for industrial purposes, but are taxable if supplied either to chemists or doctors for medicinal use. A large number of simple drugs and single chemical compounds have industrial as well as medicinal uses, although the medical man may well think with regard to a number of them that their main or their only employment is in therapeutics. But they are only tax-free when not put up for medicinal, veterinary, or toilet use. Obviously a doctor would buy these preparations only for medicinal purposes, and therefore his purchases cannot be exempted. In the case of the chemist, the wholesaler, who pays the tax and recovers it at the point of delivery to the retailer, can only supply him free of tax if he is assured that the goods are not for medicinal use.

What are officially described as "essential drugs of an exceptionally costly character" are exempted altogether from tax. It is a clumsy definition, and the first list issued is obviously incomplete. Notice of revision has been given, but at the moment of writing the revision has not appeared. Examples of the drugs included in the free list are cocaine, insulin, oxygen, sera, vaccines, sulphanilamide, and hormones, including liver and liver extracts. But "hormones," according to the ruling given presumably on the advice of the Government chemist, do not include thyroid preparations. The drugs which are included in this class are free from tax no matter to whom supplied, whether hospital, doctor, or retail chemist. Another point worth noting is that diagnostic agents are free from tax. Then there is a class of drugs which is subject to a tax of 16⅔% (the full tax is 33⅓%). These include all the drugs and compounds which are the subject of monographs or submonographs in the *British Pharmacopoeia* and the *British Pharmaceutical Codex*, but there is a list of over 300 exceptions which, as already stated, are exempt from tax if the preparations are not put up for medicinal, veterinary, or toilet use. These include, for example, the salts of bismuth, iron, lead, magnesium, and sodium, also camphor, ether, and liquid paraffin, and such a preparation as benzyl benzoate, now much sought after for dealing with lice. The latest additions to this list include catechu, methyl chloride, and sulphurous acid, among other articles. A third group comprises the compounded medicinal preparations for the treatment or prevention of human or animal ailments; these again are chargeable at 16⅔%. Thus capsules, confections, emulsions, infusions, liniments, lozenges, ointments, pills, tinctures, tablets, and syrups are subject to this lower rate of tax, whether supplied to a retail chemist for re-sale or to a doctor for use in his practice.

There remain a number of articles not specified in the lists on which the Customs authorities have given specific rulings as to whether they are or are not chargeable, and, if chargeable, at what rate. Into this category, for example, come rubber hot-water bottles (which are now charged at 33⅓%). As for medicated foods and drinks, the line has been taken that preparations employed primarily for medical purposes are taxable (again at 16⅔%), but that plain unmedicated foods, like meat extracts and essences, infants' milk foods, and also foods prepared for diabetics where the preparation is intended merely to eliminate substances such as sugar and starch, are exempt. Cod-liver oil is given as chargeable in the Notice, but is now tax-free, as are cod-liver oil capsules. But cod-liver oil emulsion with hypophosphites is chargeable: only the simple emulsion is allowed to get through the index. Vitaminized glucose and similar vitaminized preparations are also now exempt, provided they do not contain any other medicaments. Chloroform is tax-free only when supplied for use as an anaesthetic or reagent.

Many anomalies remain. It appears, for example, that a chemist may buy certain ingredients, such as those of pulv. bismuthi co., free of tax, but if he buys pulv. bismuthi co. he pays tax. On the other hand, seeing that cinchona bark, cassia pods, capsicum, and similar natural raw materials, not prepared or put up as drugs or medicines, are exempt from tax, it would seem that if someone bought an entire senna shrub it would not be chargeable, but if he bought the pods nicely put up it would be. The position with regard to natural drugs is not at all clear. All surgical appliances made from fabric materials, if prepared to a medical prescription, are tax-free, but it is essential that the name of the patient as well as of the doctor should be given. The tax does not apply to surgical boots or corsets made to the prescription of a medical

practitioner, again with reference to the needs of a particular patient. All surgical dressings are exempt. Bed-pans, urinals, etc., are subject to tax at 33⅓%; and so are eye-baths, whether sold to the chemist or the doctor. Douches, pestles and mortars, inhalers, syringes, and vaporizers are not chargeable.

The really difficult point in the administration turns upon the drugs which when supplied for industrial use are exempt from the tax and when for medicinal use are subject to tax, though at half rate. The question may be asked whether the chemists are not gaining an unfair advantage, but it should be remembered that all these matters are subject to control by the Price of Goods Act, and the Central Price Regulation Committee has already issued a guide to maximum prices. The chemist is careful not to charge excessively, and he has a high reputation to sustain. He certainly has some advantage over the dispensing doctor when both are subject to the tax, because the chemist receives a higher discount from the drug houses, and, the tax being levied on the wholesale price, he pays tax on a smaller amount. Admittedly, the chemist and the dispensing doctor are not in entirely comparable positions, and commercial considerations which obtain in the one case do not obtain in the other. Nevertheless, the situation needs careful watching lest, almost by inadvertence, a different rate of tax for doctor and for chemist is perpetuated.

CEREBROSPINAL MENINGITIS

We are now entering on the season when an increase in the incidence of cerebrospinal meningitis is to be expected; and a rise is in fact occurring, though so far it is relatively small. It may therefore be of some interest to note the lessons that we learned during the major outbreak that occurred in the winter and spring of last year. The essential fact that emerged from that experience was the vital importance of early diagnosis. It is clear that the sulphonamide compounds, and particularly, perhaps, sulphapyridine, have placed in our hands a remedy which, if it is used in time, will reduce the mortality from this disease to a small fraction of its former dimensions. It is easier to secure early diagnosis among troops under discipline than among the civil population, if only because, in civilian life, the doctor may be called in too late; and the experience of last spring made it clear that many lives were being lost that would have been saved if treatment had been instituted more promptly. The practitioner can play a vital part in reducing the case mortality from this disease by exercising a constant watchfulness for the earliest symptoms, by having the cerebrospinal fluid tested promptly in any doubtful case, and by giving precautionary and adequate doses of sulphapyridine, or of sulphanilamide, while a bacteriological diagnosis is being established. Care should, of course, be taken to discontinue the drug if the laboratory findings are negative, and to inform any hospital to which a case is admitted of the exact doses that have already been given. The other lesson that we learned last year, though many had taught it before, was the uselessness of swabbing contacts. It has become clear that carrier rates of 50% or more may be found in large sample swabbings of aggregations of men among whom few or no cases are occurring. In these circumstances the isolation of a few unfortunate carriers will produce no significant decrease in the risk of infection to which others are subjected; while the inconvenience and mental distress resulting from such isolation are by no means negligible. Beyond sending to hospital or isolating the actual case our efforts may be confined to the avoidance of overcrowding, and to any other procedure that is likely to reduce the risk of the passage of bacteria from one person's nasopharynx to that of another. In the light of our present knowledge the swabbing of contacts should be discontinued.

ENTER THE INDUSTRIAL PSYCHOLOGIST

Some while ago Mr. Herbert Morrison startled the public with the slogan "Go to it"; whereupon some people had a vision of munition workers and others in industry feverishly quickening their pace until by the extra labour of their hands twenty thousand shell fuse cases were turned out where only ten thousand had been turned out before. The problem of increased production is not solved as easily as that, and it is very likely that such an acceleration would result in human fatigue and waste of material quite out of proportion to any gain. The psychologist in industry in normal times was a kind of occasional consultant, whose help was sought only by some very up-to-date firms, but under war stress he may well become a general practitioner whose services are wanted everywhere and all the time. In the factories of this country an unprecedented number of people are at present being put to new jobs, and their rapid training is an important part of the war effort. The National Institute of Industrial Psychology has issued a threepenny pamphlet on the training of industrial workers, and into a dozen pages it has compressed a great deal of wise advice. That it is possible greatly to accelerate training in industrial processes is well known to all who have given any study to this subject. It is said that operatives in one process of coil winding can now be trained in five days to a level previously attained only in five weeks, and that in spite of the intensified training the scrap rate has actually fallen. Months or even years of experience have been regarded as necessary for the newcomer in industry. But of what sort of experience? Often the experience of watching and copying a so-called experienced worker who may be quite unsuited to give any teaching and may not be employing the best procedure himself. Or it may be that the newcomer gains experience by working out his methods for himself after being told what to do, thereby learning from his mistakes—a difficult and painful process—or settling down to a second-best way of doing things, which means uneconomical expenditure of effort and too often unsatisfactory results, wasted time, spoiled material, and general discouragement. The Institute insists that the first thing to be done is to choose a trainer for new entrants into industry—a man who not only knows his job but has the ability and temperament suited for the teaching of young workers. The training should take place away from the noise and distraction of workshops, the job should be studied and a systematic course of instruction planned. In skilled trades like engineering the learner must know a great deal about the job itself, not merely concentrate on his little repetitive process. Then there is movement study on which in the past a great deal of work has been done, primarily with a view to the saving of time and energy. In very many factories no instruction at all is given concerning correct movement. The learner works out his own movements and uses many which are unnecessary. A case is mentioned in which on one particular process it was found possible to reduce the number of working elements from 265 to 148. The task of the psychologist depends on what is known as job

analysis. He takes advantage of the various improvements in movement and in the disposition of material which suggest themselves. Often it is found that only one hand is being used to carry out a job in which both hands might easily participate. Materials and equipment are not kept in prescribed positions in which they could be picked up without conscious thought (here the industrialist might learn a lesson from the disposition of the operating theatre or the first-aid post). The booklet mentioned advises as to the choice of trainer to instruct in standard procedure. It is necessary, of course, for any trainer to bear in mind that a great deal of industrial work is monotonous, and that the young people in his charge may have recently left school, where they have been accustomed to short lessons and a varied session. Therefore he will arrange for changes in activity if possible, and he will also accommodate his requirements to individual differences in ability and in aptitude for learning, which may justify certain variations from the standard procedure. The methods of the drill sergeant are not called for in industry.

PANCREATIC ENZYMES IN THE BLOOD

The determination of urinary diastase is a time-honoured procedure; the estimation of the same enzyme in the blood has been less popular, and serum lipase has suffered from a similar neglect. Interest attaches, therefore, to 616 determinations of serum lipase on 371 patients by Johnson and Bockus.[1] They consider values exceeding 1 c.cm. of N/20 NaOH as pathological, and their highest reading was 5.5 c.cm. Broadly speaking, high results appeared to indicate pancreatic disease. Thus nine out of eleven cases of acute pancreatitis and five out of eight cases of carcinoma of the pancreas gave readings above 1 c.cm. at some stage of the disease. The few positive results in other diseases could be plausibly explained on the basis of disturbance of pancreatic function—for example, nine out of twenty-nine cases of gall-stones with obstructive jaundice. But high readings were obtained in four patients with intestinal obstruction. Clinically this is unfortunate, as the diagnosis of acute pancreatitis from intestinal obstruction is one in which help would naturally be expected from estimation of serum lipase. Liver diseases, diabetes mellitus, hyperthyroidism, malignant disease, peptic ulcer, and a variety of other conditions usually gave normal results. It is pointed out that the test is unsuited to the investigation of urgent conditions, as it takes twenty-four hours to perform. The serum diastase has been studied recently by Somogyi,[2] who has evolved two rapid and improved methods of determining this enzyme; the "saccharimetric" method appears to be the most effective: it is based upon copper reduction and is expressed as the equivalent of a blood-sugar value, figures between 80 and 150 being considered normal. It is generally agreed that much-increased values are the rule in acute pancreatitis, and according to Probstein, Wheeler, and Gray[3] moderate increases may be seen in perforated peptic ulcer involving the pancreatic region. Less work has been done on chronic conditions, but Somogyi[4] expresses the opinion that low values indicate hepatic damage. No definite proof of this statement is, however, adduced, and the slight reduction of serum diastase which he reports in diabetes mellitus would appear to be better explained on the basis of impaired pancreatic function. Finally, Comfort and Osterberg[5] have compared the value of the two estimations in a large series of cases of pancreatic disease. They found that both enzymes form a good index of active or acute pancreatitis, the lipase being raised in about 98% and the diastase in about 88% of such cases. The tests should be done within ten days of the onset of the symptoms if possible. In pancreatic carcinoma, on the other hand, the lipase was elevated in 40% and the diastase in only 8% of the cases. Raised values in other conditions—for example, gall-stones, peptic ulcer, carcinoma of stomach—could always be correlated with pancreatic involvement except for a few of the cases of hepatic disease which showed slight elevations of serum lipase. It should be noted that these authors accept a wider range of normal values than those first mentioned, figures up to 1.5 c.cm. and 320 units (Somogyi) being taken as normal for lipase and diastase respectively.

[1] *Arch. intern. Med.*, 1940, 66, 62.
[2] *J. biol. Chem.*, 1938, 125, 399.
[3] *J. Lab. clin. Med.*, 1939, 24, 449.
[4] *J. biol. Chem.*, 1940, 134, 315.
[5] *Proc. Mayo Clin.*, 1940, 15, 427.

PROBLEM OF NEONATAL MORTALITY

It is well known that the striking decline in the infant mortality rate during the past fifty years has not been equal at all ages. Over 100 years ago T. R. Edmonds in this country was one of the first to point out that it was the high death rate among infants in the first few weeks of life which accounted mainly for the high mortality figure for children under 1 year. It is generally agreed that improvement in environment and in protection against infection, more especially against intestinal infection, have been the chief factors responsible for the general downward trend of infantile mortality, but, even so, neonatal mortality remains unaltered. H. Seibert in a recent paper[1] pays particular attention to this problem of neonatal death, and discusses many factors which indicate a biological basis for the failure of the babies to survive. Age of the mother, parity, and multiple births are influencing factors and uncontrollable. The complications of labour may be averted in some instances and not in others. "If the pregnant woman," he writes, "could have the correct nourishment, good ante-natal care with rest, and if she were also free of any puerperal complications, then the newborn would issue into the world with a better chance of successfully surviving the dangerous neonatal period. But even with the best of care under the guidance of an expert obstetrician there are bound to occur some circumstances that cannot be foreseen. The process of being born is a dangerous one, and birth traumas account for a large part of the causes of death of the newborn." It is possible that in the future some of the risk of birth trauma may be reduced by the use of vitamin K to control intracranial haemorrhage, as was suggested in these columns earlier this year,[2] but Seibert notes from his study of the history of the subject that as one symptom appears to be coming under control others gain ascendancy. He thinks that there is still much to be learnt about neonatal mortality, and he is inclined to look for this, although not necessarily for a reduction in mortality, in the biological factor of constitution. One fact which favours this view is the excess mortality in male as compared with female infants. When infantile mortality rates are high both sexes are carried off more or less indiscriminately, but when the general infantile mortality rate is low it is found that more male infants die than female. This, it is claimed by some workers, is due to a purely constitutional weakness in the male sex. It is also suggested that from biological causes the fertilized ovum is "bad" from the beginning, and that no amount of protection or pre-natal care will alter the fact and prevent stillbirth or death in the early weeks

[1] *Bull. Hist. Med.*, 1940, 8, 545.
[2] *British Medical Journal*, 1940, 1, 839, 856.

of life. Animal studies indicate that a considerable amount of pre-natal death is normal in mammals, and even careful pathological examination fails to find any abnormal conditions in the dead foetus or infant. The term "congenital debility" only serves as a cloak for ignorance of such deaths. Despite the obvious pessimism of this biological point of view, there seems reason to hope that the problem of infantile mortality in the neonatal period may be tackled more energetically along certain lines. Better control of diet during pregnancy, rest for the mother for longer periods before delivery, longer intervals between pregnancies, and better teamwork in the management of the premature baby, are all ways in which some improvement might be achieved. Seibert's historical study indicates clearly what has been done in general for the young child and the successful results obtained. He also shows how little appears to have been done towards a solution of the problems of the newborn.

TREATMENT OF GAS GANGRENE

Little was known at the outbreak of war about the capacity of sulphonamide compounds for preventing or controlling gas gangrene, although such evidence as already existed was encouraging. It was clearly necessary to explore this neglected problem at once, and several experimental studies were set on foot in the hope of providing data which would serve as a guide to clinical policy. Anyone who has carefully studied the results already published by D. Stephenson and H. E. Ross[1] and by D. W. Henderson and P. A. Gorer[2] must have understood that this study has proved unexpectedly complex; factors affecting the therapeutic results in mice are not only the choice of drug and the species of *Clostridium*, but the toxigenicity of the strain used, the route of inoculation, and the menstruum. That subsidiary factors such as these last three should materially affect the outcome of an experiment is evidence in itself that the power of control exerted by sulphonamide compounds over anaerobic infections is far from absolute; indeed, it is probably of a lower order than its capacity for controlling infections by haemolytic streptococci. The subject has also been studied by E. Singer,[3] working at the Baker Medical Research Institute, Melbourne, and his findings agree in the main with those of other workers. They confirm the complete insusceptibility of *Cl. oedematiens* infection to chemotherapy, and the greatly enhanced therapeutic effect obtained in *Cl. welchii* and *Cl. septique* infections by combining antitoxin and sulphanilamide or sulphapyridine treatment. These experiments on this point indicate that giving a small dose of antitoxin greatly reduces the amount of drug required to secure survival; this combined efficacy of amounts of each therapeutic agent, either of which alone would be quite inadequate, further illustrates the synergic action described by Henderson and Gorer. Singer also describes experiments which suggest that desoxycorticosterone has some protective action against *Cl. welchii* toxin; since the hormone was given the day before the toxin it does not follow that this proceeding has anything more than prophylactic value, but the observation is neither an isolated one nor altogether empirical, and evidently merits further pursuit. If the results of these now numerous mouse experiments are neither as encouraging as might have been hoped nor as yet conclusive on certain points—such, for instance, as the relative merits of sulphanilamide and sulphapyridine—they do at least form an adequate basis for clinical experiment, and only by this means is useful knowledge now likely to be advanced much further. Cases of gas gangrene have presumably not been unknown among recent air-raid casualties, but we have yet to hear how they have been treated and with what results. Every such case is an opportunity for observations which may be of great value, and no effort should be neglected to secure its adequate study, which must of course include bacteriological as well as carefully recorded clinical data.

[1] *British Medical Journal*, 1940, 1, 471.
[2] *J. Hyg.*, Camb., 1940, 40, 345.
[3] *Med. J. Austral.*, 1940, Sept. 28, p. 275.

EMPIRE RHEUMATISM COUNCIL

The fourth annual report of the Empire Rheumatism Council is occupied largely with an account of services given to the defence Forces. Its Naval Research Foundation has continued to work with its headquarters at the emergency station of the Royal Naval Medical School; an invitation from the Royal Air Force Medical Service to assist in its plans for the treatment of rheumatic disease has been promptly accepted; and as regards the Army, the council has sought the establishment of special hospitals for the treatment of this disease. It is considered that a high incidence of rheumatic disease among soldiers is likely to arise, because, apart from other conditions of service, the intensive development of mechanized warfare makes them subject to frequent small bruising and tearing injuries and to the effects of working in cramped positions and frequent alternations of heat and cold—the environment, in fact, which is productive of rheumatic disease in industrial life. It has been deemed wise to concentrate the expert knowledge of medical men having a wide experience of the diagnosis and treatment of rheumatism in specialized hospitals; a plan to this effect has been submitted, and the council has offered its help in the fullest measure. An administrative problem, however, arises—namely, that the physical treatments which are necessary in dealing with rheumatic disease are also frequently called for in the rehabilitation of joints, muscles, and nerves injured by wounds. It is considered inadvisable to duplicate the medical and auxiliary personnel or the technical equipment, but it will not be forgotten that a very large proportion of the cases to be treated by these measures are rheumatic, and that rheumatism is primarily the care of the physician, although in many cases valuable help can be given by the orthopaedic surgeon. One of the two Sir Alexander Maclean Laboratories was suspended last year; the other continued until October, 1940, when its work was interrupted as the result of enemy action. Sir Alexander Maclean has intimated his willingness that funds from his generous gift should be diverted, as and when necessary, from the original objectives to any work for the defence services which the council undertakes. The report records the reopening in February, 1940, of the British Red Cross Clinic for Rheumatism, in Peto Place, as a most welcome restoration of treatment facilities in London. The West London Hospital rheumatism department has also been reopened.

We regret to record the death of two distinguished former officers of the Royal Army Medical Corps: Colonel Sir William Horrocks, aged 81, who was a member of the Mediterranean Fever Commission sent out by the Royal Society in 1904–5, and afterwards Director of Hygiene, War Office; and Major-General Sir George Stanistreet, aged 74, who was Deputy Director-General, A.M.S., 1918–22. The death is also announced of Dr. W. Cecil Bosanquet, consulting physician to Charing Cross Hospital and the Hospital for Consumption, Brompton.

ARMY MEDICAL OFFICERS AND MAN-MASTERSHIP

Well over a hundred R.A.M.C. officers were present when the Corps Commander, Lieut.-General A. F. A. N. THORNE, C.B., C.M.G., D.S.O., delivered his introductory address at the commencement of Corps Study Week (Medical). He began by saying he was glad of this opportunity of meeting so many of the medical officers of his Corps and that, during the short time he had at his disposal to talk to them, he wished to emphasize the important part that the medical officer could play in the life of a unit. The first and most important contribution that a medical officer could make to efficiency lay in the effort he could put forth to improve the standard of man-mastership. The principle of economy of force was of vital importance in war, and whenever a soldier, whether mentally or physically sick, was returned to duty, the medical officer had repaired some of the efficiency which would otherwise have been lost to his unit. There were literally hundreds of men who never came into the category of casualties in the true sense of the word. If the man-mastership of the unit was not of a high order these men will be the cause of a huge and avoidable loss of efficiency through their poor performance and feeble endurance. It was this avoidable loss which could and must be prevented; it could best be done by full co-operation between the medical officer and the regimental commander. The malingerer invariably appeared when hard times were experienced, but the loss of man-power through this cause must not be allowed to lessen the efficiency of the unit, which it undoubtedly would unless the medical officer took a strong line. Under a weak medical officer sick parades, instead of consisting of a few genuine cases, might come to resemble a battalion on parade.

From experience gained during five and a half years as a battalion commander, General Thorne said that the most striking lesson he had learned was the enormous amount of reliance a commanding officer must place in his padre and in his medical officer in order to raise the standard of man-mastership to a high level. Their knowledge of psychology and physiology should fit them to estimate character and to understand human nature and so to gauge the strength and endurance of individual men. While it was a mistake to impose too light a task, too heavy a task might lead to demoralization; and it was here that the advice of the medical officer should be of inestimable value.

Assessment of the Individual Soldier

The work of building up man-mastership must be done before the unit was engaged in active operations, otherwise the medical officer would be too busy dealing with actual casualties to attempt to rectify losses resulting from bad man-mastership. It was the duty of the medical officer to study and understand each individual officer, warrant officer, and senior N.C.O. in his unit; to assess character and make-up, and to note the good and bad points. He should pass on his views to his commanding officer, so that each individual might be employed to the best advantage. In this way a potential leader was not likely to be lost sight of and side-tracked by extra-regimental employment. General Thorne stressed the importance of the medical officer accompanying the regimental officers when the men attend bathing parades. It was, in his opinion, an excellent opportunity to see the men stripped and to note their physical defects, so that corrective exercises could be ordered.

All officers, warrant officers, and senior N.C.O.s must be educated in man-mastership and hygiene. The more an officer understood the complexity of the human body the better he was able to understand the involved system of control and maintenance of an army. Several books and pamphlets had been published on this important aspect of regimental life, as the result of knowledge acquired during the last war. Of these, "The Load Carried by the Soldier," by Major Lothian (Army School of Hygiene), "The Report of the Southborough Shell Shock Committee," and "The Psychology of the Soldier," by Bartlett, were good examples. If studied, they would form a solid background of knowledge and understanding which would be of great value when instructing officers and other ranks. In concluding, the Corps Commander said that, in his view, man-mastership was an art, but that medical officers, by using their technical knowledge, could make it almost a science. This should be the aim of every medical officer.

The D.D.M.S. of the Corps, Brigadier L. T. POOLE, D.S.O., *M.C.*, K.H.P., in thanking the Corps Commander for his address, pointed out that unless medical officers fully realized the importance of the points he had made they could not expect to achieve that measure of success in the preservation of man-power which was of such vital importance. Preservation of man-power by means of good man-mastership was, and always must remain, the prime consideration of every medical officer in the field. He ended by emphasizing the value of the address in that it represented the views of an experienced regimental commander.

Planning a Medical Study Week

Study Week was planned in order to give the officers of the Corps a survey, by various leading authorities, of the knowledge which had been acquired during the past sixteen months of war. Many of the officers had perhaps had little opportunity in recent months to do much clinical work or to treat many casualties due to enemy action, and a week of intensive study was arranged to keep them abreast of the recent advances in the more technical side of their duties. Two lectures, each of which was followed by a short discussion, were delivered every afternoon. Colonel J. Weddell dealt with "General Principles of War Wounds"; Colonel Ogilvie, "Abdominal Injuries"; Mr. Julian Taylor, "Head Injuries"; Mr. N. R. Barrett, "Chest Injuries"; Colonel C. Max Page, "Fracture Treatment in War"; Dr. M. D. Nosworthy, "Anaesthesia in the Field"; Dr. C. Newman, "Dyspepsia in the Army"; Colonel J. R. Rees, "Neuroses in War"; Colonel L. Colebrook, "Chemotherapy of War Wounds"; Colonel A. W. Stott, "Meningococcal Infections"; and Colonel John T. Ingram, "Common Skin Diseases and V.D." It was evident from the large attendances, not only of R.A.M.C. officers but also E.M.S. doctors, and the warm way in which the lecturers were received, that the course had been greatly appreciated.

DRESS REHEARSAL AT FIRST-AID POST

One of the first-aid posts in London which has not received a sufficient number of casualties to satisfy its large and zealous staff has, under the direction of its medical officer, instituted a system of faked casualties, which are attended with the same care and routine as if they were from an actual incident. Nothing is more depressing to the first-aid worker than to tend supposed injuries which are invisible and left wholly to the imagination. Therefore an elaborate "make-up" has been introduced under the direction of a quartermaster who is skilled in this art, and the work is carried out as carefully as anything done behind the scenes at a theatre, and is as realistic in its results. Cellophane, vaseline, and various coloured dyes are used to give a very close resemblance to the appearance of a raw wound, and in the case of one of the frequent "victims"—an orderly with histrionic gifts—the resemblance is assisted by his disordered movements and mutterings.

Instruction by Film

A cinematograph film in direct colour by the kodachrome process has been taken of the method of "making-up" these "casualties," and is available for exhibition at other first-aid posts which may care to adopt this scheme of rehearsal. A second film has been made of the "casualties" being attended by the staff, but this has not yet been released. One subject in the first film is a third-degree burn in the back, apparently extending right down to the processes of the lumbar vertebrae. Another shows the right eye apparently forced out of its socket and lying on the cheek (the secret here is that the "victim's" eye has been covered over with some paste, and the detached eye is an artificial one). As described it sounds like amateur play-acting, but watching it, and noting especially the seriousness with which the nurses and orderlies get to

work on a case, one forgets, as they do, that it is make-believe. Any feeling of unreality tends to disappear when, as often happens, the noise of London's evening barrage accompanies the demonstration, and one knows that at any moment the rehearsal may be stopped because the real thing has begun.

Volunteer Casualties

Visitors to the post may be asked to act as "casualties." One of them indicated vaguely an injury to his wrist, whereupon he was taken by the orderlies to a couch in the treatment room, where he was examined by a competent nurse and her assistants, who dressed and bandaged the "wound." Then he was labelled with the casualty card giving his name and address and description of injury, assisted to the rest room, where he was given a cup of tea, and finally sent off to hospital in dummy, as it were. One member of the staff, again, simulated a crush wound of the foot. The torn and bleeding muscles and exposed bone were admirably made up, and still more admirable was the first aid administered under the oversight, but without the interference, of the medical officer. Another demonstration was of a rescue from a supposedly bombed building of a man with a fractured femur. A small cupboard difficult of access for any team of rescuers was made to represent the bombed interior, and the rescue squad gave a fine exhibition of resource and dexterity. The bringing out of the "casualty," the application of the Thomas splint to the patient lying on the stretcher, and the dispatch of the ambulance took place in record time. Incidentally, this was carried out with everybody wearing an anti-gas respirator.

Value of Faked Casualties

Faked casualties form a really useful part of the training. They are only a part, because drill of various kinds and lectures and cinematograph films also come into the daily routine. The purpose behind it is not only to instruct nurses, orderlies, stretcher-bearers, and A.R.P. workers in the technique of first aid, but to keep them in a state of alertness and adequacy alike for the major or minor emergency.

Reports of Societies

LOWER UTERINE SEGMENT

A meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland was held on December 20, with the president, Dr. R. M. CORBET, in the chair.

Prof. O'DONEL BROWNE read a paper on the lower uterine segment and uterine descent. He reviewed the facts known about uterine support and the relative values of the utero-sacral and transverse cervical ligaments on the one hand, and the perineal muscles and fascial floor on the other. He regarded the former as the main support of the womb. During pregnancy, he said, the transverse cervical ligaments were spread fanwise upwards as a lateral brace between the broad ligaments, stabilizing the uterus. In a somewhat similar manner the utero-sacral ligaments decussated and spread out over the posterior surface of the lower two-thirds, strengthening the new lower uterine segment and preventing the heavy fundus from falling forward. Prolonged and strong uterine contractions, or forcible delivery through an undilated cervix, might easily rupture these taut and widely separated ligamentous bands. Forcible downward traction would tear the lower fibres, detaching the vaginal vault from the under surface of the pelvic ligamentous support. The resulting pull of the unsupported cervix on the still fixed higher part produced supravaginal hypertrophy. If both upper and lower ligaments were torn the uterus would descend. High rectocele was a true hernia in Douglas's pouch, between the adjacent borders of the utero-sacral ligaments. This rather rare condition was cured by approximating the two ligaments, either from above or per vaginam. The extensive colpoperineorrhaphy which cured low rectocele was no good for the hernia.

Prof. J. KAY JAMIESON described the pelvic fascia as a sling for maintaining the genito-urinary organs in position. There was no anatomical evidence for the existence of a lower uterine segment, but it undoubtedly existed in a certain phase of life. Prof. A. H. DAVIDSON thought that three operations revealed the so-called cardinal ligaments of the uterus: vaginal hysterectomy, the Fothergill operation, and Wertheim's hysterectomy. Mackenrodt's ligaments varied greatly according to whether the uterus was pulled up or down; their division constituted one of the most difficult stages of the Wertheim operation; they had to be divided as near to their insertion as possible. The lower uterine segment arose from the isthmus of the uterus—that part to which the cardinal ligaments were attached. Dr. J. S. QUIN said that the anatomist and the gynaecologist seemed to hold irreconcilable views about the formation of the lower uterine segment. In his opinion high sliding rectocele was always due to a congenital rather than a traumatic hernia. Mr. BETHEL SOLOMONS said that the supports of the uterus were very definite and every ligament helped; section of the pelvis showed that the levator ani muscles and fascia were indirect supports through the vagina. He himself did not do the typical Fothergill operation, but cut the utero-sacral ligaments and sutured them to the front of the cervix. After anterior denudation he brought the bladder pillars, which he believed to be part of the pubo-coccygeus muscle, together in front of the bladder. To cure a prolapse it was not necessary to suture Mackenrodt's ligaments, even though they were the chief supports; in fact, the operation involved danger of including the ureter. For high rectocele he brought together some tissue high up in the vagina.

Prof. O'DONEL BROWNE, in reply, referred to a series of *x*-ray investigations in which markers had been placed in the lower uterine segment at operation and subsequently watched throughout a pregnancy. He believed that the so-called bladder pillars were artificially produced by the dissecting forceps, or by the puckering of stitches.

Amputation and Repair of the Cervix

Dr. EDWARD SOLOMONS, in a paper on the above subject, said that between 1931 and 1939, 302 women had been operated on at Dr. Steevens' Hospital; of these 104 had come to hospital for follow-up examination. The operations performed on them were Emmet's trachelorrhaphy, Schroeder's partial amputation of the cervix, and circular amputation, with a number of Sturndorf amputations. Chromic or tanned catgut was used nearly always. Careful investigation and examination showed that 94 of the women had benefited considerably, and 70 had no discharge after the operation. Backache was the commonest residual symptom, and three patients had a worse discharge after operation than before. Trachelorrhaphy gave the best results for fertility, twenty-three out of a possible thirty having subsequently become pregnant. Seventy-two patients had healed completely, and one had a bad result; the rest showed some degree of ectropion or erosion. No carcinoma was found. Among 115 cases of cervical amputation or repair performed during the last two years there had been four secondary haemorrhages within a fortnight of operation, but no sepsis of any kind.

Dr. J. S. QUIN asked the indications for operation and the history of previous treatment in these cases. He thought that some erosions would respond to being left alone, or treated with very mild caustics. The MASTER OF THE ROTUNDA asked how many of these patients were nulliparous. Dr. A. W. SPAIN thought the number of amputations of the cervix was now much less than formerly; most of these conditions could be cured by cauterizing the cervix. The cautery must be used very lightly, with great care, two or three days after the menstrual period. He was sure there was a place for posterior division in some cases. Prof. A. H. DAVIDSON said that recently he had tended to abandon operation in favour of the electric cautery, unless the cervix was much hypertrophied. He thought the results for pregnancy and labour were better. In some cases the *p*H of the vagina was rather high, and erosions would completely disappear after two or three months, or even weeks, of treatment by acid media. Prof. O'DONEL BROWNE asked the indications for amputation and curettage respectively. Dr. BETHEL

SOLOMONS said that the cautery was suitable only for very early erosions, while a careful trachelorrhaphy or amputation cured nearly every case. Certain pathological conditions predisposed to carcinoma; this made radical treatment almost imperative. He had cured so much sterility by cleaning up and closing posterior division wounds that he thought the operation should be discarded.

Dr. EDWARD SOLOMONS, in reply, said that eighteen of the 302 had been nulliparous and four of these were unmarried. In 60 to 70% some other operation had been performed.

CLINICAL PATHOLOGY AT OXFORD

At a meeting of the Association of Clinical Pathologists on January 4 at Oriel College, Oxford, and the Sir William Dunn School of Pathology, Prof. A. D. GARDNER described the diagnosis of Weil's disease by assay of the agglutinins in the patients' sera. He said that among the collections of cultures of *Leptospira haemorrhagiae* he received on undertaking this work he found a few strains which did not agglutinate with antisera made from the classical strain. In his researches and in the routine diagnostic work antisera made from these aberrant strains were used. Agglutinins appeared in the patient's serum about the sixth day. It was desirable to examine sera taken at the early febrile stage of the disease, though these were difficult to obtain, the clinical diagnosis being made usually only when well-marked jaundice appeared. Several cases of leptospiral meningitis were referred to.

Dr. JOAN TAYLOR spoke of the cultural and serological analysis of cultures from Salmonella infections sent to Oxford from many parts of England. Using the table on page 410 of the *Bulletin of Hygiene*, 1938, Dr. Taylor detailed the various antisera employed, and suggested that these should be called after the accepted group or specific alphabetical and numerical factors rather than after the confusing geographical origin. Craigie's method of obtaining the actively motile bacilli by making them swim through sloppy agar was useful.

Dr. ROBB-SMITH urged that when specimens from cases of adenopathy were obtained for the histologist the whole lymph node should be excised with proper surgical precautions and fixed before being cut across. The novocain should be injected clear of the gland; otherwise structural details of the follicles, sinuses, and medullary tissue might be obscured. Axillary or lower cervical glands were to be preferred. He surveyed the differential diagnosis of cases of widespread adenopathy, emphasizing the importance of using reticulin stains for this purpose.

Dr. C. L. COPE discussed the value of estimating pregnandiol in the urine. Absence of pregnandiol after a threatened miscarriage strongly suggested that the foetus was dead. The test was also of value in the diagnosis of deciduoma malignum, since, unlike the Aschheim-Zondek reaction, it was constantly negative in this condition. Captain HANSON described the determination in the blood of the free forms of sulphanilamide, sulphapyridine, and sulphathiazole after the administration of these drugs, the aim being to assess the optimum dosage in various clinical conditions. The conjugated forms of the drugs in the blood were not therapeutically active. It was difficult to decide an optimum concentration, for the administration of the same dose of the drug might on different occasions give different results.

An informal discussion on the future of clinical pathology was opened by Dr. A. F. S. SLADDEN. The outlines of a scheme for the regionalization of laboratory services in the Provinces had previously been discussed by the association, and there was general agreement on the advisability of a scheme in which pathologists would become officers of a regional pathological service closely allied to the regional hospital service proposed in the Nuffield scheme. It was considered to be essential that clinical pathologists should work in hospital laboratories in close touch with patients, but increasing specialization in clinical pathology made it also important that they should be able to refer the more specialized work to a central laboratory. Such a plan would ensure constant diffusion of the latest information and methods, thus acting as a stimulus to research and progress.

Correspondence

The Transfusion Problem

SIR,—Dr. Peyton Rous has kindly called my attention to your leading article (November 2, 1940, p. 597) on "The Transfusion Problem." It contains the statement that stored blood, despite the addition of glucose, cannot be kept beyond a fortnight for average use. Since the limits of storage are of vital importance in military medicine this subject should be elucidated. Criteria which might be used to establish limits of storage are the quantity of free haemoglobin in the plasma, the age at which the leucocytes or platelets disappear, the titre of prothrombin, and perhaps a dozen others. Most workers have tacitly accepted the amount of haemolysis occurring during storage as the most important limiting factor. Unfortunately the renal threshold for haemoglobin varies considerably in different individuals, so that the exact amount of haemoglobin which is safe to give cannot be stated with accuracy. We are left, then, with the task of determining the incidence of reactions in recipients receiving bloods of various ages.

In reading the numerous recent British publications on stored blood it is evident that most workers are adding relatively small amounts of glucose, so that the concentration in the blood mixture is 0.5 to 1%. This is probably done in the interests of compactness. It should be noted, however, that the original mixture of Rous and Turner contained a 3% concentration of the sugar. The modification which we are using has a similar value. From studies by Hardin, Harris, Bell, and me, which are not yet published, we concluded that the optimum concentration of glucose to inhibit haemolysis was 3% or more. To attain such a value blood can be mixed with a large volume of 5.4% glucose or a smaller volume of a more concentrated solution. The latter procedure is dangerous, however, since it results in hypertonic plasma and erythrocyte contents, so that stored cells may rupture when contact is made with the isotonic plasma of the recipient.

It is our practice to add 500 c.cm. of blood to an ice-cold mixture of 650 c.cm. of 5.4% glucose in water and 100 c.cm. of 3.2% dihydric sodium citrate in water. The blood mixture is then immediately placed in the refrigerator (DeGowin, E. L., Harris, J. E., and Plass, E. D., *J. Amer. med. Ass.*, 1940, **114**, 850). The blood-glucose-citrate is used for routine hospital transfusions with an arbitrary thirty-day limit of storage. Our first statistical study on transfusion reactions from such a practice were published in this *Journal* (DeGowin, E. L., and Hardin, R. C., 1940, **2**, 1) in the hope of calling attention to the fact that blood stored for thirty days in this preservative was perfectly safe for transfusion. At the time of publication sufficient statistics on older bloods had not been accumulated to be impressive. Up to May 1, 1940, we had given 209 transfusions with bloods stored from fifteen to thirty-eight days with only three reactions: one with chills only, one with chills and fever, and one with urticaria. This is an incidence of 1.4%. There were no patients with haemoglobinuria. On December 1, 1940, we had given over 2,000 transfusions of the blood-glucose-citrate with a thirty-day limit of storage and have found the practice perfectly safe. The oldest blood transfused was given in the course of an experiment on transportation. The blood was collected in the glucose-citrate mixture and stored for fifteen days. It was then shipped in ice by transport airplane from Iowa City to Oakland, California, and back, a flying distance of 3,539 miles. The mixture was again stored, and transfused without reaction on the forty-fifth day after collection.

Since the administration of stored blood is frequently an emergency measure in the treatment of shock, we believe much valuable time is lost and excess equipment is required in prewarming the mixture to body temperature. Prof. S. L. Baker (*Lancet*, 1937, **1**, 1390) was one of the first to report that blood transfusions given at room temperature did not result in an increased incidence of reactions. Drs. Hardin, Swanson, and I (*J. Amer. med. Ass.*, 1940, **114**, 859) transfused patients with bloods taken directly from the refrigerator without

producing reactions. The blood mixture was injected into the median basilic vein at such a temperature that the cephalic vein of the same arm felt cold to the touch, but the recipients had no discomfort. In our series of over 4,000 transfusions we have been unable to find any evidence to support the view that the blood should be warmed during administration.—I am, etc.,

The State University of Iowa, Iowa City, Dec. 31. ELMER L. DEGOWIN.

Treatment of Carcinoma of the Cervix

SIR,—In reply to Mr. Victor Bonney's letter (January 25, p. 133), I readily admit that I was unwise to make any attempt in the tables in my Bradshaw Lecture to indicate any possible "staging" of the operation cases of carcinoma of the cervix, but I did explain in the text that operators had not separated their cases into stages on the lines of the League of Nations classification. Moreover, such a division of the operation cases into stages was not material to the comparison I made or to the conclusions drawn. I should be sorry to give any false impression of Mr. Bonney's achievement, which is all the more remarkable when we learn from him that the greater number of his gland-free cases would have been radiologically classified as belonging to Stage III, for that stage comprises cases presenting one or other of the following clinical features:

(*a*) Nodular infiltration of the parametria on one or both sides, extending to the wall of the pelvis, with limited mobility of the uterus or massive infiltration of one parametrium with fixation of the uterus.

(*b*) More or less superficial infiltration of a large part of the vagina, with a mobile uterus.

(*c*) Isolated metastases in the pelvic glands, with a relatively small primary growth.

(*d*) Isolated metastases in the lower part of the vagina.

The comparison which I made between the results of operation and radiation was based on the figures for all the first three stages, excluding only Stage IV, which comprises the cases that are certainly inoperable. Taking as operable all the Stage III cases in the radiological group gave a distinct advantage to surgery in the comparison.

In quoting Bonney's figures I took them as published, except that I corrected the arithmetical calculation of his five-year freedom rate. The correct rate for 142 five-year survivors out of 366 cases is 38.8% and not 40% as stated by Bonney (*Trans. med. Soc. Lond.*, 1934, **57**, 196).

I gave most careful consideration to the problem, and must leave the figures to speak for themselves as to whether my conclusions were justified. After all, when there are rival claims it is the profession as a whole which must be convinced of the best method of treatment, for it is the general practitioner who advises the patient where to seek expert assistance. The results of the two methods of treatment for carcinoma of the cervix convinced me that the advocates of radiation therapy had proved their case, even without taking into consideration the primary mortality of the radical operation, which may be as high as 20% in a surgeon's first hundred cases. A comparison of the results obtained by operation or radiation was made by Prof. Fletcher Shaw and Prof. Dougal in cases which they treated themselves, and their conclusions were the same as mine (*Surg. Gynec. Obstet.*, February 15, 1937, **64**). A further study of the results obtained at the Middlesex Hospital is about to be published by two of my colleagues.—I am, etc.,

London, W.1, Jan. 27. ALFRED WEBB-JOHNSON.

Haemorrhagic States with Snake Venom and Lecithin

SIR,—We must plead the preoccupations of the present emergency as our excuse for not having submitted the full-dress review of our studies of the coagulant action of venom–lecithin mixtures to which Dr. H. W. Fullerton is entitled, in view of his own interesting work on the action of Russell-viper venom in accelerating coagulation.[1] [2] Our observations on the inverse relation between the adjuvant action of lecithin and the number and efficiency of the platelets appeared to show something novel, and we therefore reported them first. As soon as time permits we shall publish the results of comparative studies of the various reagents used for the accelerated clotting reaction in experimental jaundice in animals and spontaneous jaundice in man. These indicate in our opinion that the venom–lecithin mixture is preferable for the determination of prothrombin times, for with venom alone anomalous results are sometimes obtained, more particularly during treatment by vitamin K. In any event it is short-sighted to think only in terms of prothrombin or to limit oneself to accelerating the clotting reaction with venom alone. When one has gone to the trouble of getting oxalated plasma and a water-bath, it is little extra work to measure the clotting times of recalcified plasma alone (Howell), plasma plus venom (Fullerton), and plasma plus venom and lecithin (Hobson and Witts). In this way three separate types of clotting defect can be distinguished—thrombokinase (haemophilia), prothrombin (jaundice), and lecithin factor (purpura haemorrhagica).

All the Russell-viper venoms we have tested show the peak of their activity at a dilution between 1/10,000 and 1/20,000, presumably because inhibitory or lytic factors come into play at higher concentrations. Although samples of the same batch are identical, different batches vary in activity a good deal. We have preferred not to work at the maximum speed of the best venoms, partly on grounds of economy and partly because it is wise not to set the level too high if successive batches are to be standardized to give identical values. Our best venom–lecithin mixtures will give accelerated clotting times of six seconds, but so great a speed is not an unmixed blessing to the observer. We have planned to make a series of statistical observations to determine the optimum activity of reagent for the purpose of the test, and in this respect it is a helpful coincidence that the venom–lecithin reagent we have chosen for these preliminary observations gives the same normal values as the acetone-dried brain extract which Quick now uses.—We are, etc.,

L. J. WITTS.
Oxford, Jan. 20. FELICITY C. G. HOBSON.

Immunization against Infection in the Army

SIR,—I was interested on reading the extract from the Harben Lectures by Lieut.-Col. H. J. Bensted (January 4, p. 187). During the last quarter of 1896 I was one of a batch of thirteen surgeons on probation for the Army Medical Service who passed the competitive examination held in London and reported for training at Netley. To all of us the lectures on bacteriology by Almroth Wright were a revelation and an inspiration. The practical course supervised by him and his assistant, Leishman, was the high-light of the whole course of training then in vogue. It aroused in us such trust and enthusiasm that I think the whole of my batch volunteered to be inoculated with typhoid vaccine. Each one had his serum agglutination titre tested before and again some weeks later. The results were uniformly satisfactory. During the summer of 1898 I served in the Nile campaign, which ended in the fall of Omdurman and the reoccupation of Khartum. The main part of the force consisted of two brigades of four regiments of British infantry. Many of these when advancing on Omdurman after the preliminary phase are said to have drunk and refilled their water bottles from a badly polluted collection of water in the Khor Shambat. The result was a severe outbreak of typhoid fever, and I myself was in charge of a great number, first in mud barracks at Darmate and later in the Citadel Hospital, Cairo. I have never seen such a virulent type of the disease in all my subsequent twelve years' service in India. A man would report sick looking as if he was in the first stage of an attack of ague. He would often be dead in seven days or less. Post-mortem would reveal an enlarged spleen and Peyer's patches uniformly swollen and inflamed, no ulceration having yet commenced. In many cases portions of the spleen were sent to the laboratory of Prof. Rupper, who cultivated *B. typhosus* from all specimens.

While serving in Peshawar (1898–1904) the incidence of typhoid was high, as it was all over India among the British troops. Again in Mhow in 1905–6 there was a serious outbreak, and it was only in the latter year that I saw any serious

[1] *Lancet*, 1940, 2, 195
[2] *British Medical Journal*, Jan. 18, 1941, p. 98.

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FIBROSITIS AND CERTAIN CASES OF RHEUMATISM

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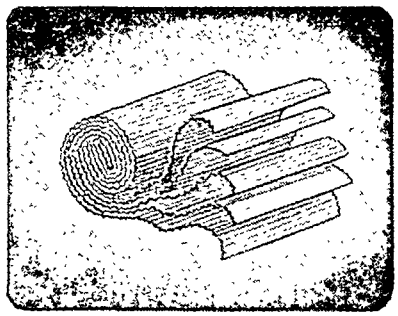
In an article entitled "Muscular Rheumatism—Local Injection Treatment as a Means of Rapid Restoration of Function," published in the "British Medical Journal," 10.8.40, page 183, the author describes the treatment of a number of typical cases of Fibrositis, etc., in different part of the body and *in all cases* immediate relief was obtained following injections of Novutox. During an attack of lumbago suffered by himself the author found one injection abolished intense pain and restored function within a matter of minutes. He also gives useful detailed information of the technique employed for the various sites of the body.

Interested members of the medical profession are invited to write for a copy of "Notes on the Treatment of Fibrositis and Recent Injuries."

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effort at immunization. Even then it merely consisted in segregating the reliefs arriving for British units and inoculating the men before they were admitted to the regular barracks. Why these men were not inoculated before embarkation or during the voyage out, a period of twenty-one days, is a mystery.

The success of more universal inoculation of troops proceeding to India in later years has been remarkable. However, the crucial test came during the war of 1914–18, in which I also served. The success of T.A.B. inoculation was overwhelming, the incidence of typhoid and paratyphoid being trifling in our forces, whereas in the French forces, I believe, some 200,000 cases occurred during the first year. The debt which the whole world owes to Sir Almroth Wright in this sphere alone is immense. As one of his disciples and an original volunteer, this small tribute of homage is offered.—I am, etc.,

W. E. HUDLESTON,
Edinburgh, Jan. 17. Colonel, A.M.S. (ret.)

Medical Planning Commission

SIR,—Like several of your correspondents in the *Journal* of January 25 (p. 131) I am seriously disturbed by the unrepresentative character of the Commission. The sixty-seven members include thirty-six consultants and specialists, nineteen general practitioners, and twelve others from various groups. But not only is the number of general practitioners disproportionately small, but even that small number is badly balanced. Of the nineteen, fifteen are from large urban areas, two from semi-rural, and two only from rural districts. Moreover, from the large number of general practitioners engaged in contract practice in colliery areas only one practitioner has been selected, and he is from Scotland, where the conditions of service and remuneration are fairly satisfactory. No possible exception could, I think, be taken to those general practitioners who have been selected, but the number of rural practitioners should be largely augmented and representation given to the colliery medical officers in the North and Midlands of England and in South Wales. I do not think urban practitioners can do justice to the special problems of rural and colliery practice, not from lack of good will but from lack of knowledge.

When first made aware of the proposed membership, I endeavoured to get it amended, but was met by the statement that the Council could not see its way to increase the number of members, already far too large. It is true that the Commission has the power to co-opt, but can this be done adequately without still further increasing an already cumbrous and almost unmanageable number?

The difficulties of this Commission are likely to be very great. Imagine a body of sixty-seven members trying to co-ordinate and dovetail the reports of its committees, some of which, if not actually antagonistic, may well be not altogether in harmony. Moreover, in practice, the balance of representation may be still further worsened by the great difficulties of travel from the Provinces at present, and yet the discussions will be vital to us all. Take one instance, the point raised by Mr. P. L. Giuseppi (January 18, p. 97)—a State medical service—what can the Commission say to that at the present juncture? For years past, as I see it, the demand for a State medical service has been becoming more and more clamant on the part of the younger members of the profession. A large number of young and middle-aged practitioners are now in a State medical service, and the list will probably be doubled before peace comes. What will be the attitude of these men to a State service when they return to civil life? Who can say? What can the Commission say? And yet, before it plans, it must have some idea on what basis it shall plan. We cannot build until we know something of the foundation on which we propose to build. Is it to be something not greatly altered from the present system, or is it to be something radically different? To my thinking, this is the vital issue to which the Commission should apply itself before any rational planning can be undertaken.—I am, etc.,

Ashover, Jan. 25. H. W. POOLER.

SIR,—Every member of the medical profession must be vitally interested in the work to be undertaken by the Medical Planning Commission recently appointed by the B.M.A. The terms of reference are necessarily vague; but the outcome will, I take it, be a scheme for the medical servicing of this country at the conclusion of the present war.

It is certain that any post-war Government will insist on radical changes in the methods hitherto adopted for giving medical service to the public. Few if any of us would attempt to argue that considerable changes are not essential. It is almost equally certain that the Government will consider sympathetically any scheme evolved by the medical profession, provided the benefits accruing to the public are clearly shown. In the past, to certain sections of political thought, we have been suspect of self-interest in the various plans we have proposed.

Clearly it is of paramount importance for the success of any scheme that it must have the whole-hearted backing of the vast majority of the profession. Such support can honestly be given only if everyone concerned in its working has previously examined the scheme searchingly and tested its merits against those of many other possible plans. A large number of practitioners consider that a full-time State service is not only inevitable but desirable; many would view such a change as a catastrophe. The preservation of full free choice of doctor and the personal relationship between patient and doctor seems to many of us to be of the utmost importance—especially from the patient's point of view. The avoidance of a multiplicity of paper work, the inevitable tendency to a lessening of initiative (promotion on "the Services" will not prevent this), and very many other adverse features of a purely State service suggest the desirability of some other scheme.

Dr. Arthur Beauchamp (Jan. 18, p. 96) congratulates the Executive Committee and the Council on the personnel of the Medical Planning Commission. The outstanding professional status of the individual members is beyond question; in fact a more distinguished body could not have been selected. It is, however, of great importance that the personnel of a Commission elected to investigate the most vital problem ever raised in medical politics should be thoroughly representative of the entire profession. The personnel of this Commission shows an utter lack of proportion as regards both (1) age groups and (2) avocation. An approximate analysis of the personnel shows:

1. Out of fifty-seven names published (ten have still to be appointed), fifty commenced medicine prior to the end of the last war, only seven commenced medicine after the end of the last war (that is, 87.7% to 12.3%), 62 are over 50 years of age.

2. *Avocation.*—Presuming that the ten members still to be appointed by the Royal Colleges, etc., will fall under the consultant group, we have: consultants, academic, public health, etc.=47 members; general practitioners=20 members—that is, 70% to 30%. Surely neither such a high age-group preponderance nor such a low percentage of general practitioners can be regarded as being in any way fairly representative of the profession.

The only way to obtain a really representative view from the profession is ultimately to secure the views of the practitioners in each area. By this I do not mean merely the various Divisions and Branches of the B.M.A., but all the practitioners (B.M.A. or non-B.M.A.; general practitioner, consultant, public health officer, etc.) in each area. These meetings can easily be convened by the good offices of each local secretary of the Association.

Not one of us will have any right to criticize the future findings of the Medical Planning Commission unless he has first whole-heartedly examined all the possibilities for himself. Nor have we any right to expect the Commission to wrestle with its enormous task unless we have all given our considered opinions from time to time. It would be unfair to the Commission and unsatisfactory to ourselves to allow it to spend untold labour in producing a finished, or even a semi-finished, scheme which would then be put up for possible criticism and amendment by the Divisions and Branches.

I suggest that the Commission be asked first to draw up a framework of possible reorganization of the medical services. This should embody the main agreed points, and also the views of the minority on any point. This preliminary report could then be sent to the local secretaries of Divisions and Branches, each of whom would call a meeting (or a series of meetings) of

all the practitioners in his area. The Commission's framework would serve as a starting point; and each area would then fill in the structure according to its own views.

These local schemes would be sent to the secretary of the Commission, who would have them summarized, and would then return a composite summary to each local secretary. Having given full consideration to the new data thus obtained, each "area of practitioners" would submit its findings to the Planning Commission. From this point the Commission, with access to outside experts (Ministry of Health, etc.), would be in a position to construct a definite scheme truly representative of the views of the entire profession. The Services members would be consulted through the appropriate channels.

Eventually a concrete plan would be submitted once again to the various areas for amendment and final touching-up. The conclusions thereafter rendered to the Commission should enable it to draw up a final scheme, which would require very little discussion by the profession.

In dealing with such a comprehensive matter, so vital to every branch of medical service and to the country, the method of procedure suggested here cannot fairly be considered cumbersome. Even in these days of stress time must be found in order to construct a successful scheme. To hasten a decision, to fail in consulting every member of the profession, would be to invite disaster on a noble project.—I am, etc.,

Bath, Jan. 20. CHARLES R. GIBSON.

SIR,—Of sixty-seven names, forty are of consultants, eight are of paid officials, the other nineteen are not definitely stated to depend on general practice alone for their living. What do the general practitioners of the country think about this? How will they voice their views; how protect their vital interests?—I am, etc.,

Bradford, Jan. 4. THOMAS SAVAGE.

Medicine in a Changing World

SIR,—To me, and I expect to most of us, Sir John Orr's address to the Leeds Division (January 18, p. 73) reads as most restrained and reasonable and free from any suspicion of entering into party politics—unless his opinion that poverty had something to do with malnutrition was in your eyes entering into that forbidden field. But that was accepted by every speaker at the B.M.A. Conference on Malnutrition in April, 1939, and I remember hearing Mr. L. S. Amery going further and saying that a "great many" industries simply "could not" (not "would not") "pay sufficiently high wages to provide adequate nourishment for a family with three children." There would not therefore appear any cause for you to use this Leeds address as an occasion to give us a lecture (p. 91) on allowing our "political emotions" to warp our judgment and suggest that this had happened to Sir John. You continue, however, "This is perhaps well illustrated by reference to the subject of Sir John Orr's lecture," and your leader on this occasion makes as little contact with fact as did that unfortunate one on shelters.

Anyhow it is hoped that you will let us have another leader in which you will tell us just what your qualifications are which entitled you to lecture us on how we are to live our lives and why your remark about members allying themselves with one or other of the political parties "somewhat ostentatiously" is not just impertinence. Perhaps a prize might be offered to anyone guessing correctly what party you had in mind. It was, however, with some relief that one read that "a doctor may cast his vote as freely as any other man," for this presumably includes members of the B.M.A., although this is not made quite clear. A charming chance led you to introduce the old tag, "The cobbler must stick to his last."—I am, etc.,

Grimsby, Jan. 20. S. W. SWINDELLS.

SIR,—I think you are right in saying (January 18, p. 91) that medical men as such should not segregate themselves into political groups. That is true; since politics is not really the best kind of sociology. One who proposes to cure the world's ills by politics—that is, polemics—is like the doctor who proposes to stamp out disease by multiplying bottles of medicine. Politics and pills are at best stop-gaps or temporary expedients. True hygiene, medical and social, should make such things unnecessary. These and other parallels are very valuable, and I hold that every intelligent doctor is, or should be, a sociologist. Also, as you yourself add, "The medical profession has within its numbers those who, more than any other group of men and women, are competent to make a statement on the physiological and psychological needs of human society." I further maintain (and could prove) that this holds of the general practitioner, and, above all, of the country practitioner with his all-round field of observation and action, more than of the specialist with his arbitrarily restricted *Fach*. The truth is that in a proper system of medical services the specialists should be subordinate or ancillary to the general practitioner, not his masters as at present. That the G.P. does not always, or even generally, take advantage of his unique opportunities and thus tends to evade his social responsibilities is due to various causes which I shall not attempt to enumerate here. The facts are, however, I am sure, as stated.—I am, etc.,

Helmsley, Yorkshire, Jan. 26. A. J. BROCK.

Trends in Nutrition

SIR,—In the lecture by Sir John Boyd Orr (January 18, p. 73) many statements are made which have already been challenged by me (vide, e.g., *Edin. med. J.*, 1940, **47**, 425). There is one, however, which I have not had the opportunity of dealing with before. On page 74 it is stated: "About fifteen years ago the subject [the influence of nutrition on susceptibility to infectious disease] was investigated by a group of workers associated with the Rowett Institute, including Prof. Mackie and the late Prof. J. J. R. McLeod. In experiments with farm animals it was found that certain immunological reactions were considerably affected by the nature of the ration."

The context shows that it is to be inferred that the more adequate the diet the greater in amount are the antibodies produced and the less the susceptibility to infectious disease. Apart from the misuse here as elsewhere in the article of the word "nutrition," it has to be stated without reservation that no such conclusion could warrantably be drawn from the results of these investigations as they are recorded in the *Lancet* of May, 1931 (**1**, No. 5622) and the *British Journal of Experimental Pathology*, 1932, **13**, 328.

Since they had been cited by him in published articles and otherwise on previous occasions in support of his present thesis, I naturally expected mention to be made here of certain other observations on similar lines conducted by himself and subordinates during this same period. As a consequence of these it was alleged that the addition of a mineral supplement (containing a high proportion of calcium) to a ration of bran and barley conferred on the rabbits receiving it protection from the effects of an intravenous injection of human tubercle bacilli. I am able to state quite categorically from the protocols and other highly pertinent details, both of which I possess, that this claim should never have been made.—I am, etc.,

Aberdeen, Jan. 18. J. P. MCGOWAN.

SIR,—It was with profound horror that I read one sentence in Sir John Boyd Orr's otherwise fine article, "Trends in Nutrition" (January 18, p. 73), in which he said: "The Canadian Medical Association has published an excellent booklet showing the kind of diet needed for different families and the cost, and has thereby *adjusted propaganda to economic realities*" (my italics). Stated in less "diplomatic" language this would read: "The Canadian Medical Association has published an excellent booklet showing not only the kind of diet needed for different families, but also the cost, thereby instructing us that we must popularize diets in relation to their cost and not to their suitability, for there are many people without sufficient money with which to purchase the best." Dietetic realities essential for health are to be subservient to "economic realities."

The tragedy of the statement lies not only in the fact that we are directed to prostitute our guardianship of the people's health but in that it is the product of old-fashioned thinking. The fundamentals of the sentence are, first, that there are certain dietetic needs which are known to exist. They are necessary for the health of the body, which was made by God and not by man. No man can lessen those needs by suggestions, laws, regulations, high cost, or any other means; they are absolute. Every fresh research shows that our know-

ledge of them is incomplete. Every advance of knowledge reveals further needs, not reduced requirements. Economic realities, on the other hand, are statements about supply, effective (monetary) demand, purchasing power, credit, and so on, put out by economic experts as being fundamental implications of inexorable economic laws. But, be it noted, all economic "laws" are man-made and are controllable and alterable by man.

It will be recalled that "the sabbath (which used to be governed by many laws) was made for man, and not man for the sabbath." In precisely the same way economic laws were made for man and not man for the laws. They were originated to facilitate man's life and private and commercial exchanges, and to simplify barter. That they have been perverted into a means of power, of control of all man's activities and even of his health, is no justification for statements such as Sir John's. It is our privilege and our duty to resist such evils and to insist that man shall be able to live a full life.

Lest it be thought that my words are merely the scribbling of some obscure person let me quote those of Lord Horder in an article in the *Sunday Times*. It will be seen that I am in the company of the great ones of the profession. "If I were made a Dictator for the purpose of doing only one thing as a contribution to the Good Life, I know what I would do. I would put the Ministers of Health, Agriculture, and Transport into a room together and keep them there until they had settled the problems of food production and food distribution in this country. *The only person* I would allow them to send for to help in their deliberations would be the *Governor of the Bank of England*" (my italics).—I am, sir,

Manchester, Jan. 24. W. SYLE CREER.

Working of A.R.P. and First-aid Services

SIR,—We have had in your columns a most interesting correspondence on equipment, etc., for use in air raids. I have been wondering for some time if correspondence or articles could not be introduced on a similar line but embracing matters on a much larger and more general scale.

It would be of the utmost value and at the same time of the greatest importance if the views of the medical officers of health and general practitioners and hospital officers could be obtained as regards the working of the A.R.P. and First Aid Services. Those who have had the fortune—or should I say misfortune?—to have actual experiences in this matter could in this way give their findings for the benefit of those who have not been in an area attacked. I feel that there must be many minor modifications in the original plans and many errors which have had to be corrected. It appears to me to be a great pity that these errors should have to be repeated in all areas, whereas were those who had had experience—and there must be many now—to give their views either in the form of correspondence or a series of articles all this could be saved.

I have been much surprised that the Ministry has not obtained such views from a questionary to medical officers of health and then informed others of the modifications found necessary in the light of actual events. I feel that there must be many slight changes which would improve such services in the area of which I am in charge, yet I cannot introduce them for lack of practical experience, and there must be many more in a similar position.—I am, etc.,

Jan. 19. R. E. JOHNSON, M.B., Ch.B.

The Mobile Unit in Action

SIR,—Dr. E. K. Macdonald (January 4, p. 30) states that it is difficult to envisage any situation in a city where a mobile unit can prove of more value than the ordinary fixed post. May I cite this instance:

The procedure our controls adopt now is to call out, first, the medical officer and sister with stretcher car to the incident. Should the medical officer see fit to call out the unit he does so. This was the procedure adopted one Sunday night recently. On arrival at the site I found high explosives had been dropped in neighbouring streets, in all of which the houses were more or less completely demolished. Near by one crater five people were entombed and required my attention. While engaged here, four messages came from adjoining streets for help. I decided to call out the unit. Once this arrived I dispatched a nurse to each street armed with *hypodermic syringe, morphine, coramine*, and dressings. The two men in the shift plus the driver acted as liaisons, fetching hot bottles and blankets to various cases. The nurses acted admirably, not only in relieving pain but in standing by the casualty for hours, and keeping torn tissues clean and free from falling mortar and debris, and administering restoratives. One case is worthy of mention—that of a young man with two-thirds of scalp avulsed. A nurse stood by this man for four hours; whenever the rescue party rested she stepped in and swabbed away debris from scalp and applied fresh pads. Surely this is not a singular case (now doing well and surely saved from sepsis by this nurse).

It is interesting to read various reports for and against the mobile units, each varying according to various doctors' experiences. Dr. J. J. Cremin's experiences at Coventry made him question (December 14, p. 847) the utility of mobile units, particularly when his unit was destroyed. Granted that a mobile unit exposes itself to great risks, this is no argument for its abolition. The crux of the question is this: Is there a need for immediate skilled treatment at this site of an incident prior to removal to hospital or is there not? Speaking as a medical officer of a mobile unit in perhaps the second worst-struck borough in London, I say there certainly is a need.

How many seriously wounded trapped cases did Dr. Cremin leave behind? Are there not trapped wounded cases at most incidents which cannot be whipped off to hospital? I agree that it is not wise to call out the whole unit in every case, but the procedure adopted here obviates the unit going to the wrong or smaller incident. These units cost £3,000 a year in trained personnel alone. Surely this is not going to be wasted. Rather would I advocate more use being made of them, but at the discretion of a medical officer at the site of the trouble rather than at the discretion of Controls, who are instructed by the local warden, with his multitudinous duties, which incidentally have never yet been defined.

May I state here my admiration of all branches of A.R.P. organization and the excellent work they are doing, but who is the "boss" at an incident? I find in my experience great need for co-ordination and leadership.

I should like to state in closing this letter that as a combatant officer in the last war I owe my life to first aid in the field—I am, etc.,

J. F. MACKIE.

Jan. 20. M.O. Mobile Unit.

SIR,—We should like to refer to, and constructively criticize, some points which have been brought to notice in the letters of your correspondents on this matter.

During the months of September, October, and November, 1940, the two Paddington Mobile Units have been in action many times and dealt with 107 casualties. In only three of these incidents did a complete unit with van turn out. On twenty-two occasions the team consisted of a medical officer, two nurses, and a stretcher-bearer whose duties include liaison, besides the driver of the car. The car was uncomfortably full when appliances were added to personnel.

The chief difficulty experienced was to get to the scene early enough. In Paddington the "Blitz" has not been nearly so intense as it was, for instance, at Coventry. It transpired that the wardens first on the spot were in the habit of asking Control primarily for a stretcher party. These men are most efficient and keen; but zeal has sometimes outrun discretion in their endeavour to save time. The presence of a mobile unit (or part of it) with its medical officer is nearly always necessary; the unit should work, not in competition, but in unison with the stretcher party, and they should be called out simultaneously. Often the mobile unit has not been ordered out because the wardens have not asked for a medical officer or, if asked for, it has been so long after the incident occurred that nearly all the casualties have already been dealt with, and the medical officer is only required to administer morphine or a general anaesthetic, or to certify death. As speed is the essence of success in our work, procedures of an operative nature, however tempting, are not, and should not be, undertaken unless, of course, life is in immediate danger. The administration of CO_2 or CO_2–oxygen has been called for.

Although the "Blitz" has eased up in London during the last six weeks, and the utility of mobile units has been questioned, we are solemnly warned—and the warning comes from those who are in a position to know—to expect further and more serious trouble during the next ninety days.—We are, etc.,

R. GALWAY MURRAY.
S. CROWN.

London, W.2, Jan. 20. M.O.s i/c Mobile Units.

The Problem of the Shelters

SIR,—With reference to Prof. J. R. Marrack's letter (January 11, p. 61), the remark of mine regarding drainage problems to which he draws attention related to Haldane's deep shelters as distinct from the surface type. With regard to his final remark that the labour and material necessary for effective indoor shelters would be prohibitive, it would be a grave disservice to the community for this to be allowed to pass unquestioned. The fact that in a great many cases these could be provided at a cost of £4 per head seated, or £8 per head in sleeping bunks, is some indication that the labour and material involved would be much less than Prof. Marrack fears.—I am, etc.,

Rugeley, Staffs, Jan. 17. H. MASON.

Pregnant Women in Target Areas

SIR,—As a practising obstetrician I view with grave concern the failure of the local authorities to evacuate pregnant women from the large maternity units under their care in areas which are well known to be likely targets for enemy aerial attack. In many cases these hospitals have already suffered damage and casualties among the patients; yet no effort has been made to evacuate the patients or even to move them to the periphery of the city. I fear that the attitude of the Ministry of Health in preventing local authorities from establishing maternity units in the country outside the city boundaries is being seized upon and made an excuse by those who are opposed to evacuation.

To carry out systematic midwifery and deal with abnormal cases under the constant threat of aerial attack is exceedingly difficult, nor can the training of pupil midwives be satisfactorily carried out. Despite this, some of our maternity hospitals are being booked with almost the same number of cases as in peacetime, and the Central Midwives Board regulations for training remain unaltered.

During aerial activity there are few more to be pitied than the full-time pregnant woman, and none more worthy of our consideration. I trust that some action may be taken while there is yet time.—I am, etc.,

Jan. 20. A MIDLAND PRACTITIONER.

Dyspepsia in the Army

SIR,—May I put forward these suggestions to supplement Mr. Reginald T. Payne and Dr. Charles Newman's "Interim Report on Dyspepsia in the Army" (December 14, 1940, p. 819). (1) How many of these cases from France indulged in the raw wines of France, obtainable at the estaminets, as compared with beer drunk here? (2) What further steps can be taken for men proceeding abroad to ensure all bad teeth are extracted, and where necessary new dentures provided before they are allowed to embark? (3) Could not some means be devised whereby the records we so laboriously kept of panel patients in peacetime be made available to recruiting medical boards. Would it not save the country a great deal of money and save the medical services much valuable time?—I am, etc.,

C. C. H. CHAVASSE.

Malaria Therapy in General Paralysis

SIR,—The recent death of Prof. Julius Wagner-Jauregg at the age of 83 years calls to mind the fact that the method of treating general paralysis by the inoculation of benign tertian malaria, which constitutes the late Professor's most notable contribution to clinical medicine, is still largely empirical, although this circumstance does not detract from its undoubted value as a therapeutic measure.

It is generally believed that the beneficial results of malaria therapy in general paralysis and certain other diseases of the nervous system are attributable to the direct or indirect effects of suddenly induced pyrexia upon the *materies morbi* or its toxin. In general support of this view I am tempted to record my personal reaction to a primary attack of benign tertian malaria deliberately acquired, *not* as a therapeutic measure but in the course of an experiment. During the hot stage the mental faculties were exceptionally clear, the imagination vivid, and several ideas regarding work then in progress flashed through the mind, some of which were actually followed up later.

I would not have ventured to record so trivial an incident lest I be charged with "presuming on an ague's privilege," but this does not apply to the account given by Wallace of how, after many years' study, he came to formulate, independently of Darwin, the theory of natural selection. Speaking of the year 1858, when he was at Ternate, Malaya, Wallace, in a letter dated December 3, 1887, reproduced at page 189 of the *Life of Charles Darwin* (1902) by his son Francis Darwin, states: "I was lying on my bed (no hammocks in the East) in the hot fit of intermittent fever, when the idea suddenly came to me. I thought it almost all out before the fit was over, and the moment I got up began to write it down, and I believe finished the first draft the next day." In a footnote the editor states that in another and later account of the same incident Wallace speaks of the "cold fit," instead of the "hot fit," of his ague attack, but doubtless the earlier account is correct, since the sole preoccupation during the cold stage is how to become warm.

The above facts lead one to wonder whether the beneficial effects of malaria therapy in general paralysis may not be attributable, in part at least, not so much to pyrexia, *qua* pyrexia, but to the blood supply of damaged cerebral tissue being permanently improved by the opening up of blocked capillaries during the hot stage.—I am, etc.,

C. A. GILL,
Reigate, Jan. 13. Colonel, I.M.S. (ret.).

Electrical Convulsant Therapy

SIR,—Our attention has been drawn to an article by Dr. E. B. Strauss and Mr. A. MacPhail in your issue of December 7 on convulsion therapy.

As manufacturers of convulsion therapy apparatus to the design of Mr. W. Grey Walter we would like to correct the statement at the foot of page 780 that he uses direct measuring current for determining the patient's head resistance. In our apparatus the resistance is measured with alternating potential applied to the electrodes, as in the original apparatus used by Fleming, Golla, and Walter. A descriptive booklet on the Ediswan apparatus is attached, and for the benefit of inquirers we would add that the price is £40 complete, net. Orders are being executed in rotation, owing to the difficulties attending present-day manufacture.—We are, etc.,

THE EDISON SWAN ELECTRIC CO. LTD.,
RADIO DIVISION.

*** We have referred this letter to the authors, and print below the reply from Mr. A. MacPhail.

SIR,—Reference is made to the paper by Fleming, Golla, and Grey Walter in the *Lancet* (1939, **2**, 1353). They describe how the patient is switched over to low-tension circuit, and voltage is adjusted until 1 mA flows through the head. From this the resistance is calculated. Because of the considerable discomfort caused by the passage of 1 mA of alternating current trans-temporally, and since the nature of the current was not mentioned, it was assumed that the direct current was used, as it is much more tolerable when gradually increased to this magnitude than the alternating current, and, indeed, we did not see why an already difficult patient should be subjected to electro-sensory changes for the mere measurement of resistance, especially when the current can be easily kept below the threshold of sensibility for measuring purposes. In our instrument this is done, and the patient at no time feels any electric sensations whatever, as Fleming, Golla, and Grey Walter admit their patients have.

We beg to tender our apologies for the statement that Mr. Grey Walter uses direct current for measurement of the trans-

temporal resistance, but when the nature of the current was not mentioned we believed that our inference was fair, knowing the discomfort of 1 mA of alternating current through the brain.

Our equipment is being manufactured by Electro-medical Engineers to our specification and is contained in a small attaché case at a cost of £40 complete.—I am, etc.,

Jan. 13. ANGUS MACPHAIL.

Oxygen Therapy

SIR,—In their valuable letter (January 18, p. 98) Mr. S. M. Cohen and Dr. W. W. Mushin have aptly drawn attention to the difficulties attending oxygen administration. This valuable therapeutic agent was used by Beddoes as far back as 1800, and in 1865 an oxygen administration apparatus was actually patented by Geo. Barth, who used it widely with apparent success.

Considering the paramount importance of oxygen in physiology, pathology, and therapeutics it is surprising that its use has been so long neglected. For is not oxidation the fundamental basis of all organic physiology, and diminished oxidation the basis of all organic pathology? Rationally, therefore, increased oxidation should be the primary aim of therapeutics. While agreeing with the writers of the letter as to the apprehension of patients and relatives being often an objection to its use, I would suggest two other considerations which also make the treatment unpopular—namely (1) the heavy and cumbersome apparatus, and (2) the cost. Neither of these difficulties need be encountered to-day, for a new type of short cylinder with a flat base, enamelled black with chromium-plated tap-fitting containing 100 cu. ft., not too heavy and fitting readily into most doctors' cars, can now be obtained.

With regard to cost, I think it is time that oxygen was controlled and made available to all doctors at a reasonable price—certainly not more than that charged to garages, oxy-acetylene welders, etc. At present I am obtaining oxygen in the cylinders described above from a firm which delivers it from a distance of thirty-five miles at an inclusive total cost of 3s. 9d. per cylinder, or £1 17s. 6d. per 1,000 cu. ft. Another firm only seven miles distant offered to supply similar cylinders at 9s. 6d. per cylinder—that is, £4 15s. per 1,000 cu. ft. As 100 cu. ft. of oxygen usually lasts about twenty-four hours it will be agreed that a cost of 3s. 9d. per day is within the means of almost anyone.

For several years I have administered oxygen in general practice by means of a small oxygen tent, which I think is preferable to the inhalation mask, especially in children. Treatment is begun in the early stages of illness, usually when the patient is obviously not in danger, and no anxiety is caused to either the patient or the relatives. I have used it in cases of pneumonia, pulmonary collapse, embolism and oedema, bronchitis, asthma, cardiac failure, whooping-cough, diphtheria, intestinal distension, narcotic and carbon monoxide poisoning, in children and adults, in all types of homes, usually with striking effect. Oxygen is a life-saver.

I hope that the Medical Planning Commission will arrange for the proper distribution of oxygen at a proper price. If it does, the profession and the public will soon be convinced of the extraordinary value of this simple remedy.—I am, etc.,

Liverpool, Jan. 20. ARTHUR G. C. FFOLLIOTT.

Adie's Syndrome

SIR,—The letter of Mr. R. Foster Moore (January 18, p. 99) claiming to have described this condition six or seven years before Adie illustrates the grave danger of eponyms. There can be no doubt that Mr. Foster Moore's communication (*Trans. ophthal. Soc. U.K.*, 1924, **44**, 38) has never received the recognition which it has deserved, probably due to the specialized nature of the journal.

But the pupillary condition was described by Ware in 1813, and later, in 1902, by Strasburger and also by Saenger. Its association with alteration of deep reflexes was recorded by Markus in 1905 and Gehrcke in 1921. All these authors can therefore claim priority over Mr. Foster Moore. Probably further probing into the literature would establish the fact that the condition was described even before 1800. I recall the aphorism of Kingston-Fowler, "To be original it is necessary not to read too much." I wonder if this haggling over priority would occur if Sir Jonathan Hutchinson's suggestion—that conditions be named after the patients in whom they were first seen—were followed.—I am, etc.,

Mitcham, Surrey, Jan. 21. MAURICE H. PAPPWORTH.

Medico-Legal

PRACTICE IN INSANITY DIVORCE SUITS

A petition for divorce on the ground that the respondent has been under care and control as a person of unsound mind for the five years immediately preceding the petition must necessarily be supported by medical evidence. Medical superintendents of mental hospitals are busy and responsible people, and attendance as witnesses in divorce actions throws an appreciable burden upon them. At the instance of the Official Solicitor, who usually acts as the guardian *ad litem* of the patient, the President of the Divorce Division recently instituted a practice whereby medical superintendents may in certain circumstances be allowed to give their evidence as to the state of mind of the patient by affidavit.[1] The procedure should, the President said, be used only where the medical superintendent can express, with reasons, an unqualified belief in the incurable unsoundness of mind of the respondent, and in the continuance of the care and treatment during the whole of the five years immediately before the petition. The affidavit also gives the medical superintendent an opportunity to deal in appropriate cases with other relevant matters, such as the provision of extra comforts for the patient. The superintendent's belief in the incurability of the patient must be unqualified. The President remarked that the words "It is my belief that the respondent is unlikely to recover" do not express such an absolute belief. Unlikelihood or improbability of recovery may be a very different thing from incurability. The new procedure is only apt when a medical superintendent feels himself able to express reasons for saying that the patient cannot be cured.

A SUCCESSFUL SILICOSIS APPEAL

It seems hard that the interpretation of a single word in a statute should make a vital difference to the life of a poor family. In deciding a recent appeal[2] the House of Lords were able to reconcile precision, common sense, and humanity. The compensation of workmen disabled by silicosis is dealt with by the Various Industries (Silicosis) Scheme, 1931. Compensation under this scheme may be paid only to workmen employed in a list of specified processes, one of which is the "crushing or grinding of silica rock, or any handling incidental to such crushing or grinding, or crushing or grinding of bricks or other articles containing not less than 80% total silica." A workman had to reline a furnace, and before doing so had to break down the old layers of silica brick. These, being cemented hard, required the use of crowbars, and the new bricks often had to be chipped into shape. Both processes generated large quantities of silica dust inside the cavity. The workman contracted silicosis from inhaling this dust and applied for compensation. The county court judge concluded that the workman was employed in "crushing" the bricks; but the Court of Appeal disagreed, largely on the ground that in other parts of the scheme "breaking" is mentioned as well as "crushing or grinding," and therefore seems to be regarded as a distinct process. Viscount Simon, however, on appeal to the House of Lords, agreed with the county court judge that the work inside the furnace could properly be called "crushing" the brick. The applicant had not only to cut the brick down by crowbar and mallet, but also to break down the old lining with sledge-hammers. This, he thought, comes within the dictionary definition "to compress with violence so as to destroy natural shape or condition: to comminute." His Lordship added that it must not be assumed that the application of one word in a scheme always excludes the possibility that another word may be applied to the same operation.

[1] *Times*, November 29, 1940.
[2] Forster *v.* Llanelly Steel Co. (1907), Ltd., 1941, 1 All E.R. 1.

Some crushing may justly be called breaking, and some breaking may amount to crushing. The other learned Lords agreed, and Lord Wright said that breaking and crushing both mean disintegration, and the difference is one of degree. In questions of the line between the application of one word and that of another the functions of the judge are peculiarly important. The judge's application of the word "crushing" to the facts could not be called insensible or such as a reasonable man could not make. The judge's order for compensation was therefore restored.

Universities and Colleges

UNIVERSITY OF OXFORD

The following medical degrees have been conferred in Convocation:

D.M.—Alice J. M. T. Barnes.

B.M.—E. Emanuel, C. M. Bisset, J. B. Searle, M. G. C. Ashby, B. S. B. Wood, P. E. Coffey, J. P. Rochford, E. J. S. Barthorpe, A. M. Joekes, G. E. Milne, P. A. L. Roberts, R. H. Gaman, *E. E. T. Taylor, *G. P. Mahar-Loughnan, *S. F. M. Cressall.

* In absence.

UNIVERSITY OF CAMBRIDGE

At a Congregation held on January 25 the appointment of Dr. T. S. Hele, F.R.C.P., Master of Emmanuel College, as deputy for the Professor of Biochemistry was continued to the end of the present academical year.

The following medical and surgical degrees were conferred:

BACHELORS OF MEDICINE AND SURGERY.—(By proxy.) J. S. Hesketh, M. R. Pollock, F. T. G. Prunty, M. A. Fawkes, O. Clarke, D. MacG Jackson, L. Read, P. F. Milling, R. C. Tufton, D. W. M. James, R. Morton, C. S. N. Swan, W. R. Burkitt, W. McC. Scott, J. O. D. Williams, A. G. Farr, L. A. Little, H. D. L. Campion, F. J. Y. Wood.

UNIVERSITY OF ST. ANDREWS

At a graduation ceremony held last month the following medical degrees were conferred:

M.B., CH.B.—R. B. Davidson. J. MacP. Jolly, Muriel Mackenzie, Christine N. R. Stalker.

SOCIETY OF APOTHECARIES OF LONDON

The Gillson Scholarship in Pathology of the Society of Apothecaries of London has been awarded to Dr. Helen M. Wright for the year 1941.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

A quarterly meeting of the Council was held at the College House on January 25, with the Vice-President, Mr. Eardley Holland, in the chair.

Membership

The following were elected to the Membership:

Alice Josephine Mary Taylor Barnes (London), Arthur Patrick Barry (Dublin), Donald Rose Beaton (R.A.M.C.), Stanley Arthur Bond (London), Margaret Muriel Burton (London), Archibald Sutherland Duncan (Edinburgh), Howard Roderick Duval (London), Jack Joseph (London), Hugh Cameron McLaren (Aberdeen), John Clifford Newbold (London), Richard Braithwaite Keevil Rickford (London), Kenneth Garratt Seager (Croydon), Kantilal Chandulal Shah (Bombay), David Chalmers Wiseman (Leicester).

Malcolm Thomas Drummond (Sydney) was admitted to the Membership *in absentia*.

The President, Prof. W. Fletcher Shaw, was reappointed to represent the College on the Central Medical War Committee, and Mr. J. P. Hedley was renominated representative of the College on the Council of the Queen's Institute of District Nursing.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the requisite examinations, have been admitted L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P. & S.Glas.:

M. A. Attia, R. R. B. Baxendine, M. Berman, R. H. Brundage, D. Collins, M. M. Dinowitz, M. Dirdack, M. L. A. El Diwany, S. C. J. Falkman, S. Finkelstein, Eleanor Franks, H. H. Frumin, F. Glass, A. A. Goldstein, G. Kilgour, I. Krauthamer, T. Lyle, D. MacKay, W. L. Milligan, Z. F. Nakhoda, R. M. Norwell, K. I. Peckitt, B. Schneider, W. Schreiber, H. J. J. Schwartz, M. Serlon, J. Simpson, F. Stein, R. Stewart, W. J. Taylor, H. B. Wender, T. Yong-Leng, A. H. Zidan.

The following graduates of recognized foreign universities were also admitted Licentiates:

E. Cohnreich, G. David, S. Geliebter, H. E. Haas, B. Hermann, E. Iscenco.

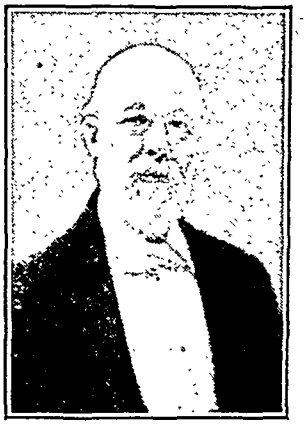
Obituary

FRANK T. PAUL, D.Sc., CH.M., F.R.C.S.

Consulting Surgeon to the Liverpool Royal Infirmary

Mr. F. T. Paul, the well-known Liverpool surgeon, died at his country home at Grayshott, Hindhead, on January 17, in his ninetieth year.

The son of Mr. Thomas Paul, he was born at Ashwood Lodge, Norfolk, and educated at the Yarmouth Grammar School. After a short time at a commercial office in London he entered Guy's Hospital, and qualified M.R.C.S. in 1873 and L.S.A. in 1874. After a year's residence as house-surgeon in Guy's he left London for Liverpool to spend the rest of his professional life in that city. His first appointment was that of resident medical officer at the old Royal Infirmary. This brought him into contact with the medical school—the nucleus of the University College and later on of the University of Liverpool. His extraordinary talents were soon recognized, and he rapidly scaled the whole range of appointments that Liverpool could offer him. Successively pathologist, lecturer in dental surgery, surgeon to the Southern and Stanley Hospitals, professor of medical jurisprudence, assistant and later full surgeon to the Royal Infirmary, he retired from the Infirmary in 1911 with the well-deserved reputation of being one of the leading surgeons of his day.



He had taken his Fellowship in 1878, and the University of Liverpool honoured him by bestowing upon him *honoris causa* the Mastership of Surgery and the Doctorate of Science. He was an enthusiastic supporter of the Liverpool Medical Institution, filling all its offices, and becoming its president in 1906 and 1907. He attained his jubilee of membership in 1925, and at the Centenary Meeting in 1937 he was elected an honorary member. Some years ago he gave to the Institution his presentation portrait and a model of his hand cast in bronze, a souvenir suggested by the original mind of the late Mr. Frank Jeans. On this interesting occasion Jeans spoke of the importance of delicacy of touch in a surgeon, whereupon Paul remarked that "a gentle touch comes from the heart rather than the hand—a touch inspired with a true sympathy for the patient's tissues."

Paul wrote little; a textbook on domestic economy and the article on intestinal obstruction in Binnie's *Surgery* were his chief publications. With a few exceptions—those in the *Transactions of the Pathological Society*—nearly all his papers were issued in the *Liverpool Medico-Chirurgical Journal*, and consequently did not reach the wide publicity among the profession that their contents merited. On the occasion of his seventy-fifth birthday his colleagues and friends collected all this material into a birthday volume of *Selected Papers*, which was published by Baillière, Tindall and Cox. This volume is of great interest, as it shows Paul's wide knowledge and originality. In it may be seen his first paper on colotomy in 1891, in which the use of Paul's tube is first mentioned, and the subsequent paper on colectomy in which he had perfected the method, often erroneously ascribed to Mikulicz,

who did not write of it until at least ten years later. In 1892 Paul wrote of his improvement on Senn's method of gastro-enterostomy by bone plates; substituting a bone ring for the bone plate and suggesting that the site should be the posterior and not the anterior wall of the stomach for the anastomosis. In 1894 he described an original method of amputation of the hip-joint, and as early as 1897 we find that he had done a partial thyroidectomy on six cases of exophthalmic goitre without a single death. In addition the book is full of microscopical studies of dentine, Nasmyth's membrane, chronic mastitis, and prostatic enlargement. Truly a remarkable achievement for one of that time.

As professor of medical jurisprudence he was often in court as an expert witness, and it is interesting to recall that he was called for the defence in the famous Maybrick case, when apparently the medical profession was as divided in its opinion as was the country generally. When the last war broke out, Paul as an *à la suite* officer was put in charge of the surgical division of the 2nd Western General Hospital at Fazackerley with the rank of major He did splendid work there as well as in the many subsidiary hospitals on both sides of the Mersey He had been a member of the British Medical Association for sixty-six years, and gave the Address in Surgery at the Liverpool Meeting in 1912.

Paul's surgical life spanned the change brought about by Lister. He often said that on his arrival in Liverpool the first surgeon he saw to wear suitable clothing for an operation was Edward Bickersteth, senior surgeon to the Royal Infirmary, who was a personal friend of Lister's. Paul early recognized the importance of the antiseptic system and the wide prospect it offered to the surgeon. He was a very hard worker, and soon found, to his surprise, that he alone was doing as many operations in a year as the whole staff of Guy's did in his house-surgeon days. His fame spread beyond the confines of Liverpool both as a brilliant surgeon and as an inspiring teacher. Modest and self-effacing to a degree, he was entirely without affectation, and was always ready to give a helping hand to his junior colleagues. It is difficult for anyone who saw Paul operate to speak of his work without superlatives. Moynihan himself said he was the neatest operator he had ever seen. When over 70 he performed delicate operations with a speed and dexterity which many younger men could not emulate.

He was very versatile, and in his younger days was a keen yachtsman, camper-out, and photographer. He was also an early motorist, doing his own running repairs. Gardening was perhaps nearest his heart, and he was something more than an amateur. In later years it remained his chief hobby and delight, and he grew orchids with great success at Grayshott. He expended on gardening the same skill and enthusiasm that he had given to surgery, bent always on the advancement of his craft.

Paul's name has already its allotted place in surgical history, but generations of students to whom he unfolded the fascination of surgery will remember him not only as a brilliant teacher but also as a kindly friend and wise counsellor. R. E. K.

[The portrait reproduced is from the presentation picture painted by G. Hall Neale.]

ERNEST W. LEWIS, M.D., F.R.C.S.ED.

We have to record with much regret the death on January 17 at Birkdale of Dr. Ernest William Lewis, honorary consulting surgeon to the Southport Infirmary and for many years an active worker in the British Medical Association. Dr. Lewis was born in South India on July 10, 1875, son of the Rev. Edwin Lewis, and from Keyford School, Frome, Somerset, went to Edinburgh University in 1892 to begin the study of medicine. He won distinction at the final M.B., Ch.B. examination in 1898 and commendation for his M.D. degree in 1906, and later obtained the F.R.C.S.Ed. Soon after graduation he held the post of house-surgeon at the Mildmay Hospital, Bethnal Green, and then returned to South India as surgeon in joint charge of the London Missionary Society's hospital at Jammalamadugu, a post he held for six and a half years. At Southport he became a member of the local bench of magistrates and served as mayor in 1933–4. Dr. Lewis joined the British Medical Association in 1900: he was honorary secretary of the Southport Division 1922–8 and chairman in 1929–30. He represented his Division at seven Annual Meetings and was president of the Lancashire and Cheshire Branch in 1934–5. At headquarters he had been a member of the Journal Committee since 1937 and also served on the Central Council during the same period. He was a member of the Liverpool Medical Institution and a Fellow of the North of England Obstetrical and Gynaecological Society.

A colleague, W. A. M., writes:

Graduating with distinction, Dr. Ernest W. Lewis spent some years in India, coming to Southport to engage very successfully in practice over thirty years ago. During the war of 1914–18 he worked at one of the local war hospitals. At this period his health broke down, and for some months he had to keep indoors after sundown. Undeterred, he prepared himself for and obtained the Fellowship of the Royal College of Surgeons of Edinburgh in 1918. Soon after he joined the staff of the Southport Infirmary, doing good work and interesting himself in the building of a new out-patient department, which had become necessary. When he retired on reaching the age limit he was chairman of the medical board. During this time he had filled the office of mayor of the town and been chairman of the local Branch of the B.M.A. In the present emergency he was vice-chairman of the Local Medical War Committee, joined the medical service, and as long as strength permitted worked as surgeon to the Southport War Emergency Hospital. When he recognized the inevitable, as unfortunately he had to some months back, he told his friends of his illness and carried on. Devoted to his family and his profession, he found time and energy for his municipal work, his flowers, and photography, but in the later part of his medical life his interest in and devotion to the work of the B.M.A. seemed to his friends the "ruling passion." When I called on him a few days before death and when anodynes at frequent intervals were necessary, Lewis wanted my opinion of the "Medical Parliament." So he leaves us with the memory of a calm courage all must admire and many of us envy.

J. R. KAYE, M.B., D.P.H.

Dr. James Robert Kaye, who served as county medical officer of health for the West Riding of Yorkshire for thirty-three years, has died at his home in Hove, Sussex, aged 85. A native of Perthshire, he received his medical education at the University of Glasgow, graduating M.B., C.M. in 1880, and taking the D.P.H. of Cambridge nine years later. While still an undergraduate his attention was drawn to the importance of hygiene by an outbreak of diphtheria, and he decided to devote his life to this branch of medical service. He was appointed M.O.H. for the West Riding in 1896: he reorganized the sanitary administration, and some twenty-five years ago had an important survey made of housing and sanitary conditions in the area under his supervision. He took an active interest in all sides of public health work, and arranged every year a "health week" for the West Riding. At the international congress of the Royal Institute of Public Health at Ghent in 1927 Dr. Kaye received the triennial award for conspicuous work in the cause of public health. He retired from his post in 1929: during his tenure of it the infantile death rate in the West Riding fell from 165 per

thousand to less than 80. In retirement on the Sussex coast he became honorary secretary of the Brighton, Hove, and Worthing Branch of the National Society for the Prevention of Cruelty to Children. He had joined the British Medical Association in 1893, and served as vice-president of the Section of Public Medicine and Industrial Diseases at the Bradford Annual Meeting in 1924. He had been president of the Yorkshire Branch of the Society of Medical Officers of Health, and during the last war held the rank of lieutenant-colonel R.A.M.C.(T.) as D.A.D.M.S. of the 2nd West Riding Division.

PROF. MAX ASKANAZY

In a recent issue of the *British Medical Journal* (writes Dr. Lina Potter) the death of two veteran professors of Geneva University was recorded: Prof. Cristiani of the Public Health Section and Prof. Max Askanazy of the Pathological Institute. Prof. Askanazy attracted many foreign students to his classes, and others in England besides the writer must have profited by his teaching. As a research worker he published work on the experimental propagation of cancer and on a wide number of other subjects. He was safe rather than daring, and when he published new work it was well documented and represented an enormous amount of investigation. He was the collaborator of Aschoff and was responsible for a section of his book. In July, 1939, a few weeks before the outbreak of war, he had just resigned his professorship at the age of 73 and was looking forward to attending a conference in the U.S.A. and to "a quiet time" of retirement to investigate a hundred and one subjects which had attracted his attention but had been put aside for routine work. His place as writer, teacher, and researcher, above all as an indefatigable worker in pathology, will be difficult to fill.

Dr. BENJAMIN MORGAN LEWIS, formerly of Sunnyside, Pontypridd, Glamorgan, died on September 28, 1940, at Bath. Son of Benjamin Lewis, Glanbarden, Govilon, Abergavenny, he was educated at Bath College and University College and Hospital, London. After qualifying M.R.C.S., L.R.C.P. in 1888, he at once went to Pontypridd and practised there for nearly fifty years. Dr. Lewis was one of the founders of the Pontypridd and District Hospital. An active member of the British Medical Association, which he joined in 1890, he was also a member of the Glamorgan Insurance Committee and Glamorgan Panel Committee. He married Marian, daughter of the Rev. David Wassell of Bath, who survives him with four sons and one daughter. "R. M. H." writes: I should like to pay tribute to this really great general practitioner. He is one of the many "Unknown Soldiers" who form the backbone of the medical profession. His passing removes one of the grandest type of general practitioners. He was indeed guide, counsellor, and friend to all his patients. He was held in the highest esteem by the members of his profession and on more than one occasion was urged to be a president of the Branch, but he shrank from publicity and preferred to carry on his good work in the background. His loss is deeply mourned by his colleagues and patients.

We regret to record the death on January 4, at the age of 77, of Dr. JOSEPH STEWART of Leeds. Dr. Stewart was born at Castlederg, Co. Tyrone, and was educated at Queen's College, Galway, and the Royal University of Ireland, where he took the degrees of M.B. and M.Ch., both with honours, in 1887. He had held the post of demonstrator in anatomy at Queen's College, Galway, and in 1889–90 he won a travelling scholarship, visiting London, Paris, Vienna, and Berlin. On his return he went into partnership with the late Dr. Robinson of Leeds, and soon afterwards married Miss Elizabeth Ann Miller of Galway, who died some years ago. Of his three sons only Dr. Barry Stewart, also of Leeds, survives him, one son being killed in the war of 1914–18 and another, Dr. Joseph Douglas Miller Stewart, who was in partnership with his father, died just over a year ago. Dr. Stewart had been a member of the British Medical Association for forty-nine years.

Dr. HENRY EDWARD SKYRME, whose death at Bournemouth occurred on January 12, was for many years a prominent and highly regarded practitioner in Cardiff. In his youth he was a chemist, but he forsook this for medicine and proceeded to the London Hospital, where he had a distinguished career, taking several medals and scholarships. Qualifying in 1888 with the Conjoint diplomas he then became a house-physician in the London Hospital, and not long afterwards settled in Cardiff. His success in practice was immediate and he soon built up one of the largest and best practices in the city, which he maintained until he retired to Bournemouth in 1922. He was a member of the British Medical Association for thirty-two years, and took an active part in the proceedings of the Cardiff Division, especially in the hectic Insurance Bill controversy of 1911; he was also a member and a former president of the Cardiff Medical Society. "G. I. S." writes: Dr. Skyrme led an active and a full life, and he was a most amiable man and a cheerful companion. He was an enthusiast in the early days of motoring, and possessed one of the first motor-cars in Cardiff. His wife died a year or two ago, and he is survived by an only daughter, who is married. Dr. Skyrme was one of the "old school," and the news of his death comes as a wistful reminder to those of us who are old enough to have known them and to have worked with them that the members of that esteemed generation are dropping off one by one.

Dr. DAVID RENNET, who died at Upton, Chester, on January 13, was the son of the late Mr. David Rennet of Aberdeen. Dr. Rennet was educated at the Aberdeen Grammar School and Aberdeen University, where he graduated M.B., C.M. in 1889, subsequently obtaining the D.P.H. at the same university. He received the degree of M.D. with commendation in 1893. Following a few years' general practice he became Assistant M.O.H. for Aberdeen City. He also was assistant professor of medical jurisprudence and public health in the University of Aberdeen, having been appointed in 1892. In 1911 he succeeded Dr. J. R. Currie (now Prof. Currie) as Medical Officer of Health for the city of Chester. Having been in the R.A.M.C. since 1907, Dr. Rennet was called up for service on the outbreak of the last war in 1914. He became specialist sanitary officer to the Western Command and was demobilized with the rank of brevet lieutenant-colonel in 1919. He subsequently received the M.B.E. During the tenure of his appointment in Chester many improvements in the public health were initiated by him, and he had the full confidence of the City Council. When he retired in 1932 he received presentations from past and present members of the City Council and members of the medical profession in the city, besides a presentation from the staff of the Public Health Department. He was a past-president of the Chester Caledonian Association, of which he was a member for many years. His wife died in 1936 and he is survived by two daughters, one of whom is a member of the medical profession. His loss will be keenly felt by many members of the medical profession and in particular by those who were fortunate to work under him in the Public Health Department in Chester. He was a member of the British Medical Association for twenty-one years.

Dr. GEORGE JAMES WILLIAMS, formerly of Haltwhistle, Northumberland, died suddenly on January 16 at Peterstone-super-Ely, Glamorgan. He was born at the beginning of 1865, and from University College, Aberystwyth, went to Newcastle-on-Tyne College of Medicine to study for the medical degrees of Durham University. He graduated M.B., B.S. in 1892 and proceeded M.D. in 1905. Dr. Williams was for a time surgeon to the G.W.R. at Fishguard, and Rosslare harbours and railways. He held a number of medical appointments at Haltwhistle, and during the last war was civilian medical officer to a brigade of the R.F.A. at Featherstone Park Camp. After moving to South Wales he became medical officer to the St. Fagans district of Glamorgan. He had been a member of the British Medical Association since 1894.

We regret to announce the death of Dr. HUGH BRINDLEY OWEN, D.S.O., which took place on January 17 at Penzance, where he practised as an ophthalmologist after a long period in the Uganda Medical Service as ophthalmic specialist and as

medical superintendent and principal of the Medical School of Mulago Hospital. He was born in 1879 and began the study of medicine at Caius College, Cambridge, which he entered in 1897, and afterwards at St. Bartholomew's Hospital, graduating B.Ch. in 1906 and M.B. in 1907. In the following year he took the D.T.M. and H. and went out to Uganda, and served with much distinction in the last war, being awarded the D.S.O. and the O.B.E. He took the D.O.M.S. of the English Royal Colleges in 1926, and after settling in practice at Penzance was elected ophthalmic surgeon to the West Cornwall Hospital in that town and to the West Cornwall Miners' and Women's Hospital at Redruth. He joined the British Medical Association in 1913 and served as Representative of the Cornwall Division at the Centenary Meeting in London in 1932. "Roddy" Owen, the name by which he was known to his many friends, was a prominent Rugby football player at Cambridge and at Bart's, for which he played as centre three-quarter in many inter-hospital matches at the beginning of this century.

Dr. JOHN FLETCHER HORNE was born at Barnsley, Yorkshire, in 1848, and received his medical education at Leeds and Edinburgh, qualifying in 1874, and later obtaining the F.R.C.S.Ed. At the time of his death he was the senior Fellow of that College. After serving an assistantship with Dr. James Braithwaite of Leeds, he acted as house-physician to Sir Clifford Allbutt at the General Infirmary, Leeds. He began practice in Barnsley in 1876, retiring in 1926. During his period in general practice he obtained the M.D. of St. Andrews University, and in 1896 was elected a Fellow of the Royal Society of Edinburgh. In 1894 he published a small volume on trephining, its ancient and modern aspects. From 1880 to 1900 Dr. Horne served on the surgical staff of the Beckett Hospital, Barnsley, and on retirement was appointed consulting surgeon. He was a member of the Barnsley Town Council for thirty-three years, and was mayor of that borough in the years 1900 and 1901. He was a Justice of the Peace for the Borough of Barnsley, and also for the West Riding of Yorkshire. He was a medical referee under the Workmen's Compensation Act, 1897, for thirty-two years. He had been a member of the British Medical Association for sixty-five years.

Dr. J. B. Horgan writes from Cork: The personality of HERBERT TILLEY has so permeated British rhinolaryngology for nearly two generations that only time can reveal the profundity of his loss. While never a pioneer Tilley early assumed a dominating position in his specialty and was always ready to bring an unbiased erudite and extremely ripe judgment to bear upon any question pertaining to his art. It was a natural sequence that his colleagues of all ages and in many lands learned to respect and indeed to rely upon the opinion of this courteous English gentleman. Tilley was always *au courant* with the cavalcade of progress which has attended the modern practice of surgery and medicine and applied this knowledge to his teaching and his practice. To quote his own simile, it is not enough for the labourer to till his own furrow, but he needs must cast his eyes upon the surrounding land and take note of the cultivation being carried out by his neighbours. The man has gone, but the gold of his endeavour will long remain as an inspiration to all those who were privileged to know him as a teacher or a friend.

We regret to announce the death of Dr. GEORGE WILLIAM HARVEY BIRD of Bridgwater, who was not only in private practice there but also held a number of public appointments, including that of medical officer of health. Dr. Bird, who was the son of a Kidderminster solicitor, received his early education at King's School, Worcester, and his medical education at Cambridge and St. Thomas's Hospital, qualifying M.B., B.Ch., and also M.R.C.S., L.R.C.P. in 1893. For a time he was house-physician and clinical assistant in the skin department at St. Thomas's, but in 1898 he went to Bridgwater as assistant to Dr. W. L. Winterbotham. Shortly afterwards they became partners, and when Dr. Winterbotham died Dr. Bird continued the practice himself. In 1923 Dr. Bird was appointed medical officer of health and school medical officer for the borough. Other official posts he held were those of medical officer of health to the Port Sanitary Authority, medical officer to the Post Office, and surgeon to the borough police force. He was appointed a member of the honorary medical staff of the Bridgwater Hospital in 1900, and at the time of his death was the senior member; he was keenly interested in the work of the hospital. With all his public work he found time for many other activities; he was a member of the Local Medical War Committee, chairman of the council of the Bridgwater Hospital League, while the work of the St. John Ambulance Brigade and the A.R.P. services also claimed his time and interest. He had been a member of the British Medical Association for forty-four years, and was chairman of the West Somerset Division in 1933–4. An appreciation of his services to the borough was given by the chairman of the education committee at a recent meeting: "Most of us came to regard Dr. Bird as something of an institution. He took great interest in every matter of importance in the town. He had very broad sympathies and wide interests. Not only will he be missed as a medical officer of health and by the education authority, but the town generally will miss him. It is the passing of a great gentleman and an accomplished medical man."

The death of Dr. JAMES BELL at the early age of 42 is severely felt by Trinity College, Dublin, of which he was a Fellow and lecturer in biophysics. He graduated M.B., B.Ch., and B.A.O. in the University of Dublin in 1934, afterwards taking the M.A., the Sc.D., and the M.D. degrees. Dr. Bell was a Fellow of the Institute of Chemistry and of the Chemical Society, to whose journal he contributed papers on the preparation and hydrolysis of guanidine and on the preparation of methyl and dimethyl guanidine. He had been a member of the British Medical Association since 1935.

The Services

HONORARY SURGEON TO THE KING

Colonel H. Stott, O.B.E., I.M.S., has been appointed Honorary Surgeon to the King, vice Colonel F. F. S. Smith, I.M.S., retired.

AWARDS

MENTIONS IN DISPATCHES

Surgeon Lieut.-Commander Kirk Forsythe, R.N.V.R. (H.M.S. *Cairo*), has been mentioned in dispatches for courage and endurance in action against enemy aircraft in Norwegian waters.

Corrigenda

In the list of officers whose names have been brought to notice in recognition of distinguished services in connexion with operations in the field, March to June, 1940, published in the *Journal* of January 4, the following were omitted: *Commands and Staff:* Colonels T. S. Blackwell, A. L. Foster, R. K. Mallam, O.B.E., M.C., and F. R. B. Skrimshire.

In the list of officers whose names have been brought to notice in recognition of distinguished services in connexion with operations in Norway, published in the *Journal* of January 4, the name of Colonel J. E. Rusby, M.C. (Commands and Staff) was omitted.

In the list of officers mentioned in dispatches, published in the *Journal* of January 4, the name of Colonel A. C. Searle should read Colonel A. C. Hammond Searle and that of Major A. E. King should be Major A. C. King.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Surgeon Lieut. THOMAS JAMES MORTON, R.N.V.R., lost his life at sea in January. He was the only son of Dr. J. L. Morton of Colyford, East Devon, and received his medical education at Charing Cross Hospital, qualifying M.R.C.S., L.R.C.P. in 1936 and taking the degree of B.Ch. of the University of Cambridge in the same year. He had held the posts of house-physician, house-surgeon, and casualty officer at Charing Cross Hospital, and at the outbreak of the war was medical officer to the Hull and Sculcoates Dispensary. He joined the British Medical Association in 1938.

ROYAL ARMY MEDICAL CORPS

Wounded

Captain Douglas Blyth Milne.
Captain (War Substantive) Arthur Lloyd Potter.

Medical News

The Right Hon. Walter Elliot, M.P., F.R.C.P., formerly Minister of Health, has been appointed Director of Public Relations at the War Office in succession to Major-General J. H. Beith.

A meeting of the Shaftesbury Military Hospital Medical Society will be held at the hospital on Tuesday, February 4, at 3 p.m., when Major Barbour will speak on "Morale in Time of War."

A meeting of the Society of Public Analysts and Other Analytical Chemists will be held at 2.30 p.m. on Wednesday, February 5, at the Chemical Society's Rooms, Burlington House, Piccadilly, London, W.

The Chadwick Trustees recently offered two prizes of £100 and £50 for essays on the construction and management of air-raid shelters, with special reference to ventilation, heating, sanitation, and the provision of sleeping accommodation. They have awarded the first prize for the essay submitted jointly by Phillip O. Reece, A.M.Inst.C.E., and S. L. Wright, M.D., M.R.C.P., D.P.H., of Wembley, and the second prize to Jocelyn F. Adburgham, L.R.I.B.A.

The British War Relief Society in New York has promised to contribute to St. Dunstan's £5,000 a month for the next five months, and has also made a gift of £5,000 to the British Hospitals Association to increase and ensure the supply of radon.

In a message of appreciation to local authorities the Minister of Health, Mr. Malcolm MacDonald, said that owing to the need for giving little publicity to air-raid damage the public had not fully grasped the capable way in which local authorities had shouldered the heavy burdens thrust upon them. Local authorities had borne much of the brunt of the battle for Great Britain. The rescue of people from damaged buildings, the care and treatment of the injured, the repair of houses and of water and sewage mains, and the rehousing of the homeless were only a few of the tasks that had fallen on them and their voluntary and regional helpers. Local authorities in reception areas had been called upon to deal with increases in population of anything between 50% and 70%, and had managed to do this cheerfully. There had been some shortcomings and some failures, but generally local authorities had risen to the occasion with resource and efficiency.

The names of Dr. Matilda Carson Welsh (Salford) and Dr. Thomas Philips Cole (Beckenham) have been brought to notice for brave conduct in civil defence.

Reports that it is not possible to get treatment at Droitwich are incorrect. Accommodation is, it is true, limited, and should therefore be engaged well in advance. The St. Andrew's Brine Baths are open, and so are the rheumatism hospitals and hostel. Information can be had from the local Spa Association.

Medical Notes in Parliament

Administrative Duties of R.A.M.C. Officers

Captain MARGESSON, in reply on January 22 to Dr. Morgan, said many officers of the R.A.M.C. were engaged exclusively on administrative work which could not be efficiently performed by laymen. He was not aware of any disquiet among medical practitioners in consequence. Certain appointments were being reviewed which had in the past been held by medical men but could, with an adjustment of duties, be held by non-medical men. Some medical officers had already been replaced.

Fortified Bread

Answering questions on January 22 by Sir Ernest Graham-Little and Mr. De la Bere, Mr. HARCOURT JOHNSTONE, on behalf of the Ministry of Food, said the cost of fortifying white flour with vitamin B_1 was not expected to exceed one-tenth of a penny per quartern white loaf. The Government had not undertaken the manufacture of this vitamin. It would for the present obtain supplies from a firm of chemical manufacturers. Proposals by two other firms had been considered. In a reply to Mr. Stokes on January 23 Mr. Johnstone said wholemeal bread made from 100% extraction flour contained per ounce about 28 units of vitamin B_1, but bread made from such a flour was not fully digested. Bread made from flour of 85% extraction, which was to be the minimum for a wholemeal flour, would contain about 20 units per ounce of vitamin B_1. It was proposed to add that vitamin to white flour in sufficient quantity to raise the content also to 20 units per ounce.

Mr. JOHNSTONE told Mr. Thorne on January 23 that a report by Dr. I. Harris of Liverpool upon the use of calcium in bread had been examined. To add calcium to bread was the Government's announced policy. The method and the amount to be added were under consideration.

Influenza Prevalence

Replying to Sir Francis Fremantle on January 23, Mr. MACDONALD said there was no evidence at present of any general epidemic of influenza. In the 126 major cities and towns of England and Wales during the four weeks ending January 13, 1940, there were respectively 27, 45, 94, and 158 deaths from influenza. The comparable figures for 1940–1 were 30, 40, 53, and 74. It was impossible to estimate with any precision the incidence of the disease in the coming months. Experience suggested that, unless a sudden marked increase in the number of deaths from influenza occurred in the near future, a serious epidemic would not supervene. All practicable steps had been taken to deal with the more serious possibilities.

Recall of Army Doctors for Civil Needs

On January 28 Sir FRANCIS FREMANTLE asked the Secretary of State for War if he would consider the seconding of medical officers from the Army, with arrangements for their instant recall in case of need, to relieve the excessive demands made on medical practitioners by the calling up of younger men and by the greatly increased demand for medical attention to the civil population during the winter months. Captain MARGESSON replied that applications for the temporary release from the Army of medical officers to meet the needs of the civil population had been, and would continue to be, sympathetically considered, but it must be remembered that the Army could ill spare their services.

Dyspepsia in the Army

On January 28 Sir FRANCIS FREMANTLE asked the Secretary of State for War what percentage of cases invalided from the British Expeditionary Force to this country were suffering from gastro-duodenal disease, and whether strict instructions would be given to recruiting boards to reject men with a history of organic dyspepsia, and save the loss and inefficiency caused thereby to the Army. Captain MARGESSON said that the percentage of patients suffering from gastro-duodenal disease among hospital cases invalided from the British Expeditionary Force was 11.76. In reply to the second part of the question, strict instructions on the point had already been given to recruiting medical boards.

Specialists as Medical Referees

On January 28 Mr. PEAKE informed Mr. Robert Gibson that ophthalmologists had been appointed as medical referees under the Workmen's Compensation Act for the Sheriffdoms of Lanark, Lothians and Peebles, and Renfrew. Medical referees to deal specially with cases of scheduled diseases (including dermatitis) had been appointed for the Sheriffdoms of Lanark and Renfrew. The Home Secretary appreciated that it might be desirable to strengthen the panels of medical referees in these and other areas by more extensive appointments of specialists, and he would be very glad to consider representations in regard to any particular area. Experience showed that it was extremely difficult to secure the services of suitable specialists as referees under present conditions.

Repatriation of Medical Prisoners of War

Mr. SAVORY on January 28 asked the Secretary of State for War what steps were being taken to facilitate the repatriation of medical officers serving in His Majesty's Forces, and now

captives in Germany. Captain MARGESSON said that the German Government had been informed that His Majesty's Government was ready to repatriate the German medical personnel who were entitled to repatriation under the Geneva Convention of 1929, if the German Government would also conform to the terms of the Convention as regarded British medical personnel in their hands. The matter was being actively pursued, but a satisfactory settlement had not yet been reached.

Tuberculous Persons in Shelters.—On January 22 Mr MACDONALD stated that in addition to taking power to exclude a tuberculous person from a public shelter if his presence in the shelter was likely to be dangerous to other shelterers, he had made suggestions to local authorities for dealing with this problem. The responsibility for safeguarding the public health in any particular area rested in the first instance on the medical officer of health for the area. He had no doubt that officer would take steps to secure the provision of alternative shelter accommodation for any tuberculous persons for whom he thought such provision necessary in the public interest.

Notes in Brief

Mr. Lyttelton is reviewing the question of the restriction of 50% on the making of surgical belts and elastic hosiery for medical purposes.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The last week of 1940 is remarkable in that, with the one exception of cerebrospinal fever, the incidence of the important notifiable diseases has declined compared with the preceding week. It is probable that delays in getting the returns from outlying areas, and perhaps a tendency to postpone notification for a few days until holidays are over, have been factors in the observed decreases, and the figures for next week may show a corresponding artificial change in the opposite direction.

Notifications of cerebrospinal fever were the highest for twenty-three consecutive weeks, being nearly four times those for the last week of 1939. Although the number is small compared with the peak figure of 623 in the week ended March 2, 1940, the early rise must give cause for some anxiety on account of present conditions. The disease is present in over two-thirds of the sixty-one administrative areas of the country, all of them potential foci for outbreaks of epidemic magnitude. The areas most heavily involved were: Lancaster 14 (Liverpool 7, Manchester 2, Bootle, Burnley, Blackpool, Leigh M.B., and Kirkham U.D., 1 each); London 12 (Kensington 4, Camberwell 2, Battersea, Bermondsey, Fulham, Hammersmith, Lewisham, Poplar, 1 each); Warwick 11 (Birmingham 7, Coventry 2, Sutton Coldfield M.B. 2); Chester 10 (Chester 3, Birkenhead 2, Altrincham M.B. 2, Congleton M.B. and Chester R.D. 1 each, Runcorn R.D. 1); Glamorgan 7 (Cardiff 3, Llwchwr U.D. 2, Port Talbot M.B. and Pontypridd U.D. 1 each); Durham 6 (Darlington and Sunderland 1 each, Felling U.D. 2, Billingham U.D. and Lanchester R.D. 1 each); and 5 each in the following administrative areas: Derby, Gloucester, Northumberland, Salop, Sussex W., Worcester, Yorks, West Riding, and Monmouth.

Measles is by far the more prevalent infectious disease at present, and it is probable that the incidence will continue to rise during February and March, but the abnormal conditions forbid even tentative prophecies. In the winter and spring of 1939–40, when measles was expected in epidemic force in accordance with its usual biennial periodicity, incidence was abnormally low, except in two densely populated administrative areas—Lancaster and the West Riding of Yorks. Whooping-cough, the next in order of prevalence, has also risen in recent weeks. The case-fatality of whooping-cough is nearly always higher than that of measles and much more invalidity follows in its train.

In August and September the fall in incidence of measles is attributable in part to climatic factors and in part to the effects of evacuation on the distribution and exposure of the non-immunes. With the advent of winter the increase has been progressive but not uniformly so. The steady low level of whooping-cough furnishes a striking contrast.

No. 52 for 1940

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended December 28, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1940 (a)	1940 (b)	1940 (c)	1940 (d)	1940 (e)	1939 (Corresponding Week) (a)	1939 (Corresponding Week) (b)	1939 (Corresponding Week) (c)	1939 (Corresponding Week) (d)	1939 (Corresponding Week) (e)
Cerebrospinal fever	171	13	35	1	4	45	5	16	—	1
Deaths		—	4				—	—		
Diphtheria	1,090	47	415	18	26	805	20	245	42	37
Deaths	30	—	7	2	—	24	—	9	2	3
Dysentery	112	4	22	—	—	37	2	27	—	—
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	2	—	—	—	—	4	—	—	—	—
Deaths			—					3		
Enteric (typhoid and paratyphoid) fever	20	—	6	10	—	12	1	6	8	1
Deaths	—	—	—	1	—	—	—	1	—	—
Erysipelas		29	61	4	—		1	62	8	7
Deaths		1	—					—		
Infective enteritis or diarrhœa under 2 years	39	2	5	6	1	22	3	12	4	4
Deaths										
Measles	13,188	366	153*		16	2,157	9	16		125
Deaths	23	4	3	—	—	7	—	—	1	—
Ophthalmia neonatorum	44	2	17	1	—	50	4	15	—	—
Deaths										
Pneumonia, influenzal†	857	41	11	5	1	649	27	15	3	6
Deaths (from influenza)	40	2	7	3	1	46	8	3	1	—
Pneumonia, primary			223	1				271	13	
Deaths‡		49		8	13		13		13	9
Polio-encephalitis, acute	2	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	8	—	2	—	—	4	—	—	—	—
Deaths		—					—	—		
Puerperal fever	1	1	13	3	—	2	2	10	—	—
Deaths		—					1§			
Puerperal pyrexia	71	—	14		—	129	6	9		2
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,193	65	215	41	24	1,042	22	169	50	74
Deaths	3	—	—	1	—	3	—	—	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths		—	—	—	—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,846	20	135*		16	602	9	11		6
Deaths	16	1	7	—	1	3	1	—	1	1
Deaths (0–1 year)	336	24	64	28	14	322	38	99	22	16
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	6,150	523	682	155	145	5,960	1,030	715	212	152
Annual death rate (per 1,000 persons living)			13·8	10·3	12·7			14·5	14·3	13·4
Live births	2,863	168	786	152	137	3,755	507	931	260	167
Annual rate per 1,000 persons living			15·9	10·1	12·0			16·8	17·5	14·7
Stillbirths	161	8	44			211	22	27		
Rate per 1,000 total births (including stillborn)			53					31		

* Notification in certain administrative areas only.

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

‡ Since January 1, 1940, figures for London (b) have been for deaths from all forms of pneumonia; the corresponding figures for 1939 relate to deaths from lobar pneumonia only.

§ Death from puerperal sepsis.

Letters, Notes, and Answers

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QUERIES AND ANSWERS

Diphtheria Incidence: A Small-pox Analogy

Dr. C. KILLICK MILLARD (Leicester) writes: Dr. Robert Anderson's reply (January 25, p. 144) to Dr. R. M. Courtauld is intended to demonstrate, presumably, the value of diphtheria immunization by comparing it with vaccination against small-pox. In both cases it has been established that those individuals who have been protected (vaccinated or immunized) show a far smaller incidence of small-pox or diphtheria than those who have not been protected. This has often been regarded as conclusive evidence of the value of vaccination or immunization in protecting the community. Indeed, the case for vaccination in the past was largely based upon it. Unfortunately there is a possible fallacy in this argument, for it is not safe to argue from the individual to the community. Personally I believe that the case for vaccination in protecting a community has been greatly overrated on account of this fallacy, and to-day most authorities will agree, I think, that small-pox has vanished from this country for quite other reasons than vaccination. In India, on the other hand, vaccination (although it protects the individual, as in this country) has signally failed to protect the community, and the death rate from small-pox in India continues to be appalling, although the amount of vaccination and revaccination done there is, in proportion to population, far greater than in this country. In the case of immunization against diphtheria, although it has been proved that it protects the individual, we are still awaiting conclusive evidence (from this country) that it will protect the community. How many (if any) towns or districts can we point to where there is evidence, as yet, that diphtheria mortality has been reduced as the result of immunization? I am certainly not opposed to immunization, and very much of my time at present is being devoted to the immunizing of children against diphtheria.

Dysmenorrhoea

Mr. A. J. HOBSON, F.R.C.S. (Wimbledon), writes: I should like to recommend the following prescription to "Country Practitioner" (December 28, p. 924) for use in dysmenorrhoea:

℞	Ac. lact.	gr. cc
	Cret. praecip...	gr. lxxv
	Chlorof.	ɱviij
	Aq. .. .. ad	ʒviij

F.m. Sig.: ʒj, t.d.s., p.c.

The mixture should not be made any stronger than this, and no more than four days' supply prepared at once, otherwise it becomes thick and valueless. I find that it cures or substantially relieves three out of four cases of dysmenorrhoea without organic cause. It is also an excellent curative and even better prophylactic for chilblains. It is, in fact, the only medium I have yet encountered by which calcium can be introduced to the human economy in a satisfactory way by the oral route.

Prevention of Herpes Labialis

"H. A." writes: I should be grateful for suggestions for the prevention of recurrent attacks of herpes labialis. The patient, a lady, never suffered from the attacks till four years ago, but now has attacks frequently; she attributes it to infection from another sufferer.

Treatment of Snoring

Dr. GEORGE MACDONALD (London, W.1) writes: I have been consulted recently by patients who snore. In view of so much communal sleeping this complaint has become of pressing importance. I wonder if there is any way in which I could find out the latest information about it with regard to a line of treatment. It struck me that possibly some ideas might have developed as a result of the present situation.

Income Tax

Cessation of Practice—Commencement of Appointment

"J. C." ceased general practice three years ago and afterwards accepted a public appointment. How should his earned income be calculated?

*** *Cessation.*—The income for the financial year in which the general work ceased should be calculated at the amount of the earnings for the period from the previous April 6 to the date of cessation; as regards the previous financial year the Revenue has the right of raising the assessment to the amount of the earnings for that (actual) year. If this was not done at the proper time the Revenue can now correct the omission by making additional assessments, but it is not seen why they should claim to do so "in respect of the last three years."

Commencement.—The rule is, as regards (*a*) the part of the first year to April 5—the actual basis; (*b*) the first complete financial year—the actual basis; and (*c*) the next year—the previous year's earnings—that is, the same amount as for (*b*). It should, however, be borne in mind that if the earnings for the third year—that is, (*c*) above—are less than the amount assessed, the taxpayer can claim, within twelve months, to have the assessment reduced to the actual basis. The standard rates of tax in recent years have been: 1939–40, 7s. in the £; 1940–1, 8s. 6d. in the £. The expense of "J. C.'s" postgraduate course is not regarded as allowable.

War Service—Civil Emoluments

"BELFAST" is in the Army, and his employers are making him an *ex gratia* payment to supplement his Army pay. Are these amounts liable to tax?

*** Yes. They are received in respect of his past civilian services, and cannot be successfully argued to be "gifts."

LETTERS, NOTES, ETC.

Definition of Surgical Shock

Mr. A. P. BERTWISTLE, F.R.C.S.Ed., writes: The need for clarification of the meaning of the word "shock" is obvious to all who teach first-aiders. The term "shock" has many meanings to the layman. I suggest that the adjective "surgical" would help to clear his mind of the other shocks he knows of. The actual nature of the underlying factors is still in dispute, but the theory which regards it as dilatation of the capillaries of the voluntary muscles fits in best with the findings and treatment. The following definition appears to be as good as any: *Surgical shock is a condition of depression or helplessness due to loss of circulating blood brought about by actual haemorrhage, pain, anxiety, or cold, or by all four factors acting together.* The best example of surgical shock is the patient who has just had a severe operation and has recovered from the anaesthetic. At least one member of the class will have seen such and can describe it to the rest in words intelligible to the layman. This definition suggests the treatment. Bleeding is arrested as soon as possible; fluids, and above all transfusion, make up this loss. Pain is relieved by gentle splints for fractures, and morphine at the post. Anxiety is relieved by efficient work by the team. Cold is countered by blankets and hot-water bottles.

Ether Convulsions

Dr. W. F. COOPER (Raynes Park, S.W.20) writes: The following point may be of interest and might possibly produce some solution of the difficulty. In working out the best saline for tissues much work has been done on most of the ions. But one which is always present in tissues, blood, etc., has had very little work done on it, is seldom considered in salines, and never used. That is the magnesium ion. This is a very peculiar ion, and so it is the more odd that so little has been done on it. Bayliss in *General Principles of Physiology* (1918) gives an account of it. On page 217 he refers to the work in which Meltzer showed that only about one-tenth of the amount of ether normally used was necessary if magnesium sulphate solution were injected intramuscularly. Some of us will have used it, probably to augment the effect of morphine in obstetrics—and it certainly seems to be good. So that it seems that the magnesium ion has some sedative effect, and this suggests that the convulsions may be due to lack of it in the blood of those particular patients; that the cure and also prophylactic measure would be to inject it. In fact, it seems extremely odd that this work has not been followed up as a possible routine method of anaesthesia. Some patients do seem to be lacking in magnesium in so far that it is often very beneficial. I believe that it is always good to give in any skin affection, and by injection sometimes; and this applies to eczema more than anything.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY FEBRUARY 1 1941

Correspondence

The New War Damage Bill

SIR,—Dr. Henry Robinson (*Supplement*, January 25, p. 10) very properly reminds the medical profession that it is very deeply concerned with the provisions of the above Bill. As regards the voluntary part of the scheme—our private goods and chattels—he adds that it will be of interest to discover the reactions of the insurance companies on this matter. At the moment they are rather in the dark, but here is a personal experience gained only yesterday. The insurance company consulted strongly advises their clients to make an inventory *now* of everything in the house, and to deposit one copy with them. In the average household this can usually be done without seeking professional aid.

If the householder's ordinary peacetime fire policy only covers his goods and chattels for one-fourth of their value—say £500—and he now seeks war protection to the maximum of £1,500, he will find it difficult to convince the Government that he is not either under-insured or over-insured, with a consequent subsequent loss to himself. The company consulted therefore advised that both the peace and war policies should be for the same amounts. Under these conditions a war premium on, say, £1,000 will cost about £25 per annum, payable only for the duration, with any necessary readjustment in the peacetime premium. The reverse position is discussed by Dr. Robinson in his article.

With only partial destruction of goods and chattels from enemy action the insured person without an inventory may experience considerable difficulty in obtaining even an approximate compensation. The compilation of the inventory so strongly urged upon us is a staggering and illuminating commentary on what one stands to lose in the way of clothes alone. Try it and see, and do not forget your wife's fur coat.—I am, etc.,

Bristol, Jan. 25. RICHARD J. A. BERRY.

Medical Calling Up

SIR,—There appears to be a great deal of misgiving among members of the medical profession as to who should and who should not be called upon for service in the Forces, and, judging from the weekly list of casualties in the medical services published in the *British Medical Journal*, it is obvious that there is a growing demand for medical men for the Forces both at home and abroad. I would like to suggest that instead of expecting general practitioners to abandon their practices in order to join up the public health departments all over the country should be carefully scrutinized with a view to ascertaining how many medical men below the age of 45 can be spared from those departments for service in the Forces. These men can be more conveniently released from their civilian posts than general practitioners, as there are many of 45 years or less who are medical officers of health or assistants who, I think, will be anxious to join up if released by their councils, and who can be replaced for the "duration" by either assistants above the age of 45 having sufficient experience, or retired medical officers and assistants willing to do duty for a time to ease the situation.

Further, I would suggest that in calling upon medical men for compulsory service they be selected from those in the age groups 40 to 45 years or more first, leaving the lowest groups (usually those who are newly qualified) to be called up last, so that they will have an opportunity of gaining some experience before joining the Forces. This will also prevent those of the 40 to 45 age group from slipping into a category that may be considered too old for service.—I am, etc.,

Warrington, Jan. 22. C. A. PAULUSZ.

Bonus for Local Government Officers

SIR,—Although this does not affect me personally, I would like to take the opportunity of thanking the British Medical Association for persuading the present Minister of Health to reverse the rather extraordinary decision of his predecessor in this matter. You may be assured that the successful efforts of the Association will be widely appreciated by those concerned.—I am, etc.,

G. B. PAGE,
Exeter, Jan. 20. Medical Officer of Health.

DOCTORS MUTUAL ASSISTANCE SCHEME IN ACTON

Dr. H. L. Sparrow, chairman of the West Middlesex Division of the British Medical Association and of the Local Medical War Committee, has sent us the following details of a scheme providing assistance for doctors and their practices in the borough of Acton.

The object of the scheme is to afford professional assistance to any practitioner practising in or near the boundary of Acton in the event of his being killed by enemy action or incapacitated for the same reason, or his house or surgery being rendered uninhabitable. It is not the intention of this scheme to interfere in any way with the working of the Middlesex Protection of Practices Scheme: it is intended only to tide over the practitioner (or his executors) until his practice is disposed of or he has sufficiently recovered to resume work, or his house has been made usable or he has found other suitable premises.

It is suggested that Acton be divided into areas with an area officer in each, to whom the doctor or his representatives can immediately appeal for assistance. Each area officer will hold a list of six or seven practitioners who have expressed their willingness immediately to look after whole or part of the practice of a colleague. Work so done will be free, and any private patients attended by any acting doctor will be charged by him and the fee refunded at stated intervals to the practitioner for whom he is acting. If a doctor's premises are rendered unusable and the doctor himself is not injured, the area officer will, on application, arrange with a neighbouring practitioner for the temporary use of his surgery. It is suggested that such assistance would be granted for a period not exceeding one month, but this period could be extended with the approval of the committee.

DIPHTHERIA IMMUNIZATION

The text of a letter on this subject, which has been sent by the Secretary of the British Medical Association to Medical Officers of Health in England and Wales, was published in the *Supplement* of January 11, 1941. Section (*d*) of the Association's scale of fees is as follows:

> (*d*) These fees are inclusive of a report to the local authority. The report should be as simple as possible, providing for the name of the patient, the date of the inoculation(s), the amount and name of the reagent used, the identification number of the reagent, and the result of the immunization.

A medical officer of health has suggested that the form of report should include the address of the patient in addition to the other details mentioned. The address is an important means of identification, especially in county areas, where it enables the immunized persons to be more readily classified in their respective towns and villages.

DENTAL BOARD GRANTS

The Dental Board has been compelled by the reduction of its income consequent upon war conditions to discontinue the allocation hitherto made of large sums of money for dental research. The maximum which the Board found it possible to allocate for this purpose in 1940 was £250. In many instances research work, apart from any question of the Board's grants, has been suspended, but the Board has been anxious to provide, within the limited amount mentioned, for those cases in which dental research is still being pursued but might be closed down if the grant were not forthcoming. With this in view it has made a grant of £50 to the University of Birmingham in order that certain facilities in the dental research department may remain in being. The following grants by the Board in aid of teaching schools, on certain specified conditions, have been accepted: three grants at the rates of £500, £250, and £250 a year to the University of Birmingham towards the salaries of a professor of dental surgery, an assistant clinical instructor, and a demonstrator in dental pathology; two grants of £325 and £175 to the University of Liverpool towards the salaries of a demonstrator in conservative dental surgery and a demonstrator in orthodontics; two grants of £250 to the School of Dental Surgery of the Royal Dental Hospital of London in aid of the salary of demonstrators in the orthodontic and conservation departments; two grants of £500 and £250 to the University of Sheffield towards the salaries of a professor in dental surgery and a lecturer and demonstrator in dental mechanics, and a grant of £200 a year to the University of Leeds towards the salary of a demonstrator in prosthetic dentistry.

Medical Services of H.M. Forces

Appointments

ROYAL NAVY

Surgeon Lieut.-Commander D. F. Walsh to be Surgeon Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Probationary Surgeon Lieuts D. Rice, C. A. J. Sampson, S. A. Swanson, and C. W. Levitt to be Surgeon Lieutenants.

Probationary Temporary Surgeon Lieuts. J. H. A. Jewell, H. T. L. Broadway, R. C. Bennett, J. H. Cobb, and A. J. G. Pullar to be Temporary Surgeon Lieutenants.

ARMY

Colonel J. T. Johnson, D.S.O., retired, late R.A.M.C., has reverted to the rank of Lieut.-Colonel at his own request whilst employed during the present emergency.

ROYAL AIR FORCE

Flight Lieut. T. C. Macdonald has been promoted to the war substantive rank of Squadron Leader.

Flight Lieut. N. Mackenzie has relinquished his short service commission on account of ill-health.

Flying Officers A. G. Burke and W. R. Parker to be Flight Lieutenants.

ROYAL AIR FORCE VOLUNTEER RESERVE

Flying Officers D. Wilson, D. St. C. L. Henderson, and B. B. Botha to be Flight Lieutenants.

Flying Officers A. N. H. Peach, B. A. E. Harley, J. North, D. W. Mahon, M. Hamilton, W. R. Mackie, J. G. Moloney, and J. Evans have been promoted to the war substantive rank of Flight Lieutenant.

J. P. Griffiths to be Flying Officer.

The notification in the *London Gazette* of December 20, 1940, concerning J. L. Trent and J. G. M. McMurchy should read Flying Officers and not Pilot Officers.

The notification in the *London Gazette* of December 31, 1940, concerning W. Poskett should read W. Foskett.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Colonel E. M. O'Neill, D.S.O., has ceased to belong to the Reserve of Officers on account of ill-health.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Supernumerary for Service with Glasgow University Contingent (Medical Unit) O.T.C.—E. W. Walls, late Cadet Lance-Corporal, Hillhead High School Contingent (Junior Division) O.T.C., to be Lieutenant.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Captain S. G. Reed has ceased to belong to the Territorial Army Reserve of Officers on account of ill-health.

LAND FORCES: EMERGENCY COMMISSIONS

ROYAL ARMY MEDICAL CORPS

The surname of Lieut. A. A. Alderdice is as now stated, and not as notified in the Supplement to the *London Gazette* dated July 19, 1940.

Lieut. H. Ferguson has relinquished his commission.

Dr. (Lieut.) Mrs. Mabel G. Bain has relinquished her appointment.

Lieut. B. G. Kelly has resigned his commission.

Lieut. J. Garden has relinquished his commission on account of ill-health.

To be Lieutenants: J. Brown, J. L. Macaulay, J. R. Dunn, H. Sington, P. H. Deeny, T. W. Sweetnam, F. E. Adams, T. R. Hill, N. Hockman, T. A. Kelly, D. W. Moynagh, W. F. Nicholson, M. A. Shellim, J. Kay, J. W. Dent, C. T. Gasking, F. Lanceley, J. M. Mair, J. H. Ramage, R. W. Panton, I. A. B. Cathie, L. G. Cook, R. J. V. Pulvertaft, H. S. Legge, G. D. McDowall, A. G. N. Calder, S. Chatterjee, J. W. Clark, A. I. Clay, B. R. M. Johnson, A. L. McLeod, H. J. Newlands, A. B. Linton, N. Rees, W. M. Shearer, R. M. Solomon, G. R. Taylor, D. C. Williams, J. D. Ballantine, T. H. C. Barclay, E. I. M. Catraher, K. W. Evans, I. S. Ede, E. G. Hardy, W. I. A. Heron, W. N. Hine, J. M. Knight, D. G. McReera, B. O. Moore, R. S. Patrick, J. Speer, J. A. Weir, J. A. Liley, B. Freedman, T. H. B. Fuller, B. A. Furniss, R. H. Isaac, Y. Premsukl, J. P. Jackson, L. E. D. Knights, G. Mann, R. K. Pillay, R. S. Risk, I. Seaal, R. S. Stevenson, P. S. Thorne, F. R. Turner, H. R. Anand, R. L. Coulter, L. H. Davies, G. Carter, W. N. Gilchrist, R. W. S. Harvey, W. G. Healy, W. Herbert, J. F. Heslop, J. G. Gillan, E. Joffe, J. S. Kerss, A. McLeod, W. W. Newman, J. M. Peden, A. N. Surtine, K. W. Todd, H. A. Tod, J. McD. Dougan, L. Redhouse, J. S. Barker, F. B. Youge, P. W. D.-Rowell.

B.M.A. LIBRARY

The following volumes were added to the Library during November, 1940.

Aris, N.: Parents and Children. 1940.
Bailey, H., editor: Surgery of Modern Warfare. Parts I and II. 1940.
Berman, J. K.: Synopsis of the Principles of Surgery. 1940.
Britton, H. T. S.: Chemistry, Life, and Civilization. 1940.
Brown, W.: Psychology and Psychotherapy. Fourth edition. 1938.
Conybeare, J. J., editor: Textbook of Medicine. Fifth edition. 1940.
Cutler, E. G., and Zollinger, R.: Atlas of Surgical Operations. 1939.
Dayton, N. A.: New Facts on Mental Disorder. 1940.
Drummond, J. C., *et al.*: Nation's Larder. 1940.
Fraenkel, G., and Gunn, D. L.: Orientation of Animals. 1940.
Kronfeld, P. C.: Introduction to Ophthalmology. 1938.
Macintosh, R. R., and Pratt, F. B.: Essentials of General Anæsthesia, with Special Reference to Dentistry. 1940.
Miller, W. S.: The Lung. 1937. Reprinted, 1940.
Mottram, V. H.: Healthy Eating. 1940.
New York Academy of Medicine. March of Medicine. 1940.
Nicholls, L.: Tropical Nutrition and Dietetics. 1938.
Pearce, E.: Fevers and Fever Nursing. Fourth edition. 1940.
Pugh, W. T. G., and Pugh, A. M.: Practical Nursing. Third edition. 1940.
Rolleston, Sir H., and Moncrieff, A. A., editors: Modern Diagnosis. 1940.
Whitwell, J. R.: Syphilis in Earlier Days. 1940.
Witmer, H. L.: Psychiatric Clinics for Children. 1940.
Wolff, E.: Anatomy of the Eye and Orbit. Second edition. 1940.

B.M.A.: Branch and Division Meetings to be Held

STAFFORDSHIRE BRANCH: NORTH STAFFORDSHIRE DIVISION—Joint meeting with North Staffordshire Medical Society. Sunday, February 2, 11 a.m. P. W. Edwards: Practical Hints on Wartime Food Problems.

WEEKLY POSTGRADUATE DIARY

EDINBURGH POSTGRADUATE LECTURES.—At Edinburgh Royal Infirmary, Fri., 4.30 p.m. Prof. R. J. S. McDowall: The Physiological Approach to Medical Problems.

DIARY OF SOCIETIES AND LECTURES

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At Royal Society of Medicine, 1, Wimpole Street, W., *Mon.*, 3 p.m., Mr. F. Ronald Edwards, Dried Plasma: Its Preparation and Administration for the Syndrome of Shock.

ROYAL SOCIETY OF MEDICINE

General Meeting of Fellows.—Tues., 3.30 p.m. Ballot for election to Fellowship.

Section of History of Medicine.—Wed., 2.30 p.m. Paper by Dr. J. D. Rolleston: Medical Aspects of Saint Simon's Memoirs.

Section of Surgery.—Wed., 2.30 p.m. Presidential Address by Mr. J. B. Hunter: The Emergency Medical Service and the Future.

Section of Otology.—Fri., 10.30 a.m. Discussion: The Psychological Aspect of Deafness. Openers, Prof. H. Frey, Dr. A. B. Stokes, and Mrs. Irene H. Ewing.

Section of Laryngology.—Fri., 2.15 p.m. Discussion:—Adenoids: Their Influence and Methods of Removal. Openers, Mr. V. Negus, Adenoids: With Reference to Methods of Removal; Mr. W. Stark Adams, The Influence of Adenoid Infection on Nasal Sinusitis in Children.

APPOINTMENTS

BORHAM, J. D., M.R.C.S., L.R.C.P., Examining Factory Surgeon for the Southwold District (Suffolk).

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements amount should be forwarded with the address of the sender, and should reach than the first ***post Tuesday*** *morning*

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 8 1941

GEE-THAYSEN DISEASE

(IDIOPATHIC STEATORRHOEA OF ADULTS AND ADOLESCENTS IN NON-TROPICAL COUNTRIES)

BY

JOHN F. O'SULLIVAN, M.B., B.Ch.N.U.I.

Late House-physician, Mater Misericordiae Hospital, Dublin; House-physician, War Memorial Hospital, Scunthorpe

WITH A NOTE AND A POSTSCRIPTUM

BY

HENRY MOORE, M.D., D.Sc., F.R.C.P.I., F.R.C.P.Lond.

Professor of Medicine, University College, Dublin; Physician, Mater Misericordiae Hospital, Dublin

This disease, of which two cases are recorded here, has received considerable attention during the past decade. Coeliac disease was first described by Samuel Gee (1888) of London, and the condition as it occurs in adults and adolescents of non-tropical countries was first extensively studied by Thaysen (1929, 1932): hence the reason for the nomenclature, Gee-Thaysen disease, a name first suggested by Moore, O'Farrell, Geraghty, Hayden, and Moriarty (1936) and later supported by Mogensen (1937).

These two cases came under the care of Prof. Henry Moore in the Mater Misericordiae Hospital, Dublin, since the publication of the ten cases described by him and his co-workers in the paper mentioned above. Each has been fully investigated on the basis of the criteria then advanced. The recent work of Kantor (1939) has added what may prove another important diagnostic feature—i.e., roentgenological changes in the small intestine. These are (*a*) obliteration of the usual markings of the valvulae conniventes—the "moulage" sign: and (*b*) dilatation of the small intestine and segmentation of the contained barium into "clumps." In neither of our cases can it be said that Kantor's findings were discovered. In the previous series of cases from this hospital (Moore and others, 1936) three had duodenal abnormalities, and one of these (Case 4) showed "duodenal and jejunal delay with marked diminution of the typical markings of these bowel segments."

Treatment in both of our cases proved very gratifying. In this connexion the experiments of Barker and Rhoads (1937) are of interest. These authors concluded that in tropical sprue the parenteral administration of liver extract exerts some specific effect upon the absorptive power of the small intestine. Blood-fat determinations in sprue patients before and after liver therapy, with normal subjects as controls, support their conclusions. Snell (1939) reports that the appearance of the small intestine, as shown by roentgenological observation, was restored to practically normal by the parenteral administration of liver extract. In our second case satisfactory clinical response may have been to some extent influenced by the liver extract therapy, but this is doubtful.

Case I

An unmarried man aged 28 was admitted to hospital on November 7, 1938. The family history was negative. His own history was uneventful up to the age of 18, when he was treated for "glands in the neck," which disappeared. His present trouble began some months before admission with loss of appetite, lack of energy, and loss of weight, which he estimated at a stone and a half: at that time also he began to suffer from diarrhoea.

Physical Examination.—His weight was 93½ lb. and height 63¾ in. He was thin and pale, the tongue was too red and too clean, and papillae were scanty. Beard and moustache were absent. Examination of the lungs revealed some scattered rhonchi in both. The abdomen was slightly distended, while the descending colon was palpable and tender. The testicles were small: the pubic and axillary hair was scanty, and the former was feminine in distribution. Chvostek's and Trousseau's signs were negative and the clinical physical examination was otherwise normal.

Laboratory Investigations.—Blood chemistry (in mg. per 100 c.cm.): Serum calcium, 8.9: inorganic phosphorus, 3.1: urea, 42: cholesterol, 115. A blood examination showed 3,860,000 erythrocytes and 4,100 leucocytes per c.mm., with a normal differential leucocyte count: haemoglobin, 60%: and colour index 0.77. A blood smear revealed slight anisocytosis and poikilocytosis. A fractional test meal disclosed a very low curve of free HCl, the maximum being 16 units. The basal metabolic rate was −24%. The peroral glucose-tolerance test (ingestion of 50 grammes of glucose) gave the following results:

Time	Blood Sugar
Fasting	76 mg. per 100 c.cm.
In 30 minutes	85 " " " "
In 1 hour	83 " " " "
In 2 hours	63 " " " "
In 3 hours	61 " " " "

The curve was "depressed," the greatest increase of blood-sugar value being 9 mg. per 100 c.cm. (normal increase, 40 mg.). The faeces were light, clay-coloured, foul-smelling, and porridge-like. Microscopical examination did not reveal starch, undigested muscle fibres, or neutral fat: there was an excess of soaps, fatty acids, and other fat combinations, but no pus, blood, or mucus. On ordinary ward diet the weight of the stools averaged 40 oz. a day over a period of one week after admission. Chemical analysis of the twenty-four-hour stool (under ward dietary conditions) gave 46.23% total

lipoids, with normal fat splitting and a nitrogen output in the faeces of 8.34 grammes; the nitrogen figure, however, fell to a more normal one while the patient was under treatment. The results of the twenty-four-hour chemical stool analysis are summarized in the accompanying table, along with those of Case II.)

Table showing Chemical Analyses of 24 Hours' Faeces

Case	Date	Total Weight of Moist Stool	Dry Matter	Total Lipoids	Neutral Fat	Free Fatty Acid	Soap Fat	Total Lipoids	Neutral Fat	Nitrogen	Approx. Fat in Diet
		gm.	%	%	%	%	%	gm.	gm.	gm.	gm.
I	18/11/38	1,140	14.33	46.23	10.85	29.54	5.84	75.47	17.64	8.34	Full diet, 77
	17/1/39	653	9.02	58.53	9.72	21.35	27.47	34.48	5.70	3.02	
II	29/9/39	436	19.15	54.01	21.68	13.23	19.10	45.12	18.00	4.30	Full diet, 69
	3/11/39	203	16.47	20.18	6.26	12.02	1.90	7.06	2.05	1.96	

Roentgenological Examination.—No evidence of pulmonary disease was observed. There was a rapid passage of barium meal through the small intestine, and very marked redundancy of the large bowel with associated stasis and dilatation of the lumen due to intestinal gas. The epiphyses of the lower ends of the ulnae were not united to the shafts, while those of the lower ends of the radii, tibiae, and femora, and the upper ends of the tibiae were but partially united. A moderate degree of bony subcalcification was shown by controlled radiography of the hand. Barium enema examination emphasized the marked redundancy and dilatation of the colon; owing to the large amount of enema required to fill the entire colon it was considered inadvisable to fill the large bowel completely.

Examination of the eyes revealed normal refraction, and slit-lamp examination showed no abnormality of the lenses.

Treatment.—The patient was put on a low-fat diet consisting approximately of carbohydrate 218 grammes, protein 88 grammes, and fat 77 grammes per twenty-four hours. He was given 25 minims of dilute HCl with a little pepsin thrice daily by mouth after meals, and daily in addition, orally, 9 grains of ferrous sulphate, 40 grammes of calcium gluconate, 25 mg. of calciferol, and a vitamin preparation which furnished a daily intake of 18,600 international units of vitamin A, 150 international units of vitamin B_1, 30 Sherman units of vitamin B_2, 600 international units of vitamin C, and 2,700 international units of vitamin D. Under this treatment the bulk of the faeces was reduced considerably: over a period of two weeks before discharge they averaged about 22 oz. a day. Diarrhoea was completely relieved and steatorrhoea was reduced from 75.47 to 34.48 grammes of total lipoid per twenty-four hours (see table). Nine weeks after admission the blood count showed: erythrocytes, 3,800,000 per c.mm., haemoglobin 70%, and colour index 0.92. The patient left hospital on the above treatment on January 25, 1939.

Re-examination on July 20, 1939, after approximately six months of this treatment at home, showed a gain in weight of 30¼ lb. and an increase in height of almost one inch (2¼ cm.); the axillary and pubic hair was more plentiful, but the latter was still feminine in distribution. The patient had had no diarrhoea since his stay in hospital and he stated that he felt, and he certainly looked, extremely well. There was apparently no anaemia (no blood count was done). He was seen again in May, 1940. For the previous twelve months or so his only treatment was a low-fat diet. His weight was approximately 10 stone, and he reported that he felt well, was able to do a full day's manual labour on a farm, and had no diarrhoea, the stools being well formed and normally coloured. The pubic and axillary hair had increased, and he stated that libido was present. A test meal was normal and the blood count showed 4,210,000 erythrocytes and 101% of haemoglobin. He certainly looked in very good health.

Summary.—A man aged 28 suffering from diarrhoea, lack of energy, loss of appetite, loss of weight. Examination showed a mild hypochromic anaemia, moderate bony subcalcification, ununited epiphyses, infantilism, and steatorrhoea. Treatment with a low-fat diet, iron, and vitamins produced striking improvement clinically, a gain in weight of more than 3 stone, and an increase in height of 2¼ cm.

Comments on Case I

1. The diagnosis of Gee-Thaysen disease might seem to be in doubt because of the high faecal nitrogen (8.34 grammes). This would suggest pancreatogenous steatorrhoea: Thaysen (1932) considered that a faecal nitrogen which much exceeds 3 grammes daily indicates this latter condition. The faecal nitrogen estimation in the present case was reported on four occasions during the next fortnight, with the following results: 3.58, 4.19, 4.68, and 3.65 grammes. These figures are considerably lower than the first analysis, although still somewhat above Thaysen's figure; but when considered with the "flat" type of blood-sugar curve, the absence of muscle fibres in the stools, and the clinical course of the case, the diagnosis of pancreatogenous steatorrhoea may be discarded.

2. After reduction of the fat intake the percentage of lipoid in the faeces did not become reduced; indeed, it increased from 46.23% of the total dry matter to 58.53%. Nevertheless, although the percentage of total lipoid did not fall on treatment, the amount of lipoids in the stools by weight fell from 75.47 to 34.48 grammes, and of neutral fat from 17.64 to 5.7 grammes—a drop of 55% and 70% respectively. The effect of curtailment of fat on the faecal lipoid output was considered by Moore and his co-workers (1936) in the previous series of cases studied in this hospital; it was concluded that usually the percentage of lipoid in the faeces varied directly with the fat intake. Nevertheless inconsistent results were obtained (Cases 6 and 10) in which the percentage output was greater after the restrictions in the diet. Bennett, Hunter, and Vaughan (1932) made a special investigation of this point on one patient (Case 1); they found that the percentage faecal output was reduced with a low-fat diet although even then on the average the fat comprised more than 25% of the dried faeces. Clinically in the present case the fat-poor diet controlled the diarrhoea, although it cannot be exactly stated to what extent fat absorption was influenced by the treatment.

3. At 28 years the patient increased in height by almost one inch (2¼ cm.). Epiphyses were ununited before treatment began. Two cases in the series reported by Moore *et al.* (1936) (Cases 4 and 7, aged 22¾ and 19 years) also increased in height while under treatment. Thaysen suggested that hypovitaminosis of the fat-soluble vitamin A is an important factor in causing the infantilism of this disease. Mogensen (1937) investigated one patient for vitamin A deficiency according to the method of Edmund and Clemmesen (1936), and he concluded that there was probably a deficiency even though there were no clinical signs. He suggested, therefore, that therapy should include regular administration of vitamin A. In patients with ununited epiphyses this ought to be particularly valuable. In the present case 18,600 international units of vitamin A were given daily.

Case II

A male aged 19 was admitted to hospital on September 21, 1939, with the complaint that he had not increased in weight during the previous two years despite an inordinate appetite. For four years he had been treated for anaemia with liver orally and later on with liver extract. He was listless, easily fatigued, and disinclined for any considerable exertion. He stated that for as long as he could remember he had had diarrhoea (three to four motions a day), with the exception of an interval of three years at a boarding-school when apparently he was unwittingly being treated by a low-fat diet. With the exception of bronchopneumonia at the age of 2 years there had been no other serious illness, and the family history was not significant.

Physical Examination.—The patient was emaciated and markedly underdeveloped. His height was 64½ in. and weight 91½ lb. Anaemia was pronounced and there was a brownish pigmentation over the malar regions; beard and moustache were absent. The abdomen was distended and tympanitic, the testicles were small, the pubic hair was scanty and feminine in distribution, and the axillary hair was also scanty. The papillae on the tongue were small and few, the tongue itself was too red and too clear, and the mucous membrane was atrophic. As regards bony structure, he was lightly built, genu valgum was present, and the lower thorax was unduly expanded, so that the subcostal angle was practically 160 degrees. Blood pressure was 110/52. Auscultation of the heart revealed blowing systolic murmurs at apex and base. Intellectually the patient was alert and had reached an honours standard in the school examinations. The clinical physical examination was otherwise normal.

Laboratory Investigations.—Blood chemistry (in mg. per 100 c.cm.): urea 30, serum calcium 8.8, inorganic phosphorus 3, blood cholesterol 140. Blood count: erythrocytes 2,190,000 per c.mm.; haemoglobin 30%; colour index 0.68. Anisocytosis and poikilocytosis were pronounced and there were a number of macrocytes. A fractional test meal showed almost complete achlorhydria—3 units of free HCl were present in only one specimen. The basal metabolic rate was − 17%. The peroral glucose-tolerance test (ingestion of 50 grammes of glucose) showed:

Time	Blood Sugar
Fasting	71 mg. per 100 c.cm.
½ hour after ingestion	118 " " " "
1 " "	85 " " " "
2 hours "	75 " " " "
3 " "	77 " " " "

The curve was "depressed" in type. The faeces were pale, soft, rather foul-smelling. Microscopical examination showed excess of fatty acids, soaps, and other fat combinations, but no further abnormalities. The weight of the twenty-four-hour stool over several days averaged about 8 oz. Chemical examination of the twenty-four-hour specimen showed 54.01% total lipoids—21.68% neutral fat and 32.33% of total split lipoids. The total faecal lipoid output was 45.12 grammes per twenty-four hours—nearly four times the average normal output. Faecal nitrogen amounted to 4.30 grammes. The details of these analyses are compared in the table with the result of a similar analysis performed when the patient had been on a low-fat diet for five weeks.

Roentgenological examination showed no evidence of pulmonary disease, and there was some bony subcalcification with all the epiphysial lines unusually open for a subject of 19 years. A radiograph of the gastro-intestinal tract showed gastro-intestinal hypermotility and redundancy of the distal colon. *Slit-lamp examination* disclosed no abnormality in the lenses.

Treatment.—The patient was put on a diet of approximately 339 grammes carbohydrate, 95 grammes protein, and 69 grammes fat. His appetite was enormous, and even on this regime, with a caloric value of approximately 2,300, he complained of hunger. Accordingly he was allowed bread *ad lib.*, which enabled him to satisfy his appetite without appreciably raising his fat intake. In addition he was given 30 minims of dilute HCl three times daily after meals, 9 grains of ferrous sulphate daily, and a vitamin preparation which supplied daily 18,600 international units of vitamin A, 150 international units of vitamin B_1, 30 Sherman units of vitamin B_2, 600 international units of vitamin C, and 2,700 international units of vitamin D. The patient was also given four courses of liver extract intramuscularly, each course consisting of 2 c.cm. daily for three days; this, however, was probably unnecessary.

Symptomatic improvement was rapid on this treatment. The number of daily motions was reduced from three during the first week to one thereafter, and the faeces became formed and much less objectionable in smell, but there was no significant alteration in their weight. Great improvement was shown after treatment (see table). The basal metabolic rate changed from − 17% on September 30 to + 3% on November 11. There was no increase in height while under observation, but the patient put on 17 lb. in fifty-nine days. A fractional test meal after five weeks' treatment and after one year from discharge showed complete achlorhydria.

The anaemia rapidly disappeared, and this improvement was accompanied clinically by the disappearance of the heart murmurs and a striking change in the patient's appearance. From one who seemed stricken with a serious wasting illness he was transformed into a lively, healthy-complexioned youth. For the past year the only treatment was the low-fat diet and 25 minims of dilute HCl with a little pepsin thrice daily after meals, but improvement continues to be well maintained. On September 30, 1940, his health was excellent, he had gained 33 lb. in weight and 2 in. in height. He is now an active healthy medical student. For the past two months he has done equally well without the hydrochloric acid.

Summary.—An emaciated male aged 19 years with a long history of diarrhoea, suffering from lack of energy and inability to increase in weight. Examination showed a slight degree of hypocalcaemia, some bony calcification, steatorrhoea, infantilism, non-union of epiphyses, and a severe degree of anaemia. Treatment produced a most satisfactory clinical response.

Comments on Case II

1. The high percentage of neutral fat requires consideration. Fowweather (1926) states that (*a*) where neutral fat exceeds 11% of the dry matter one should suspect defective fat splitting; (*b*) if the total split lipoid exceeds 16% of the dry matter one should suspect deficient fat absorption. In this case neutral fat was 21.68% of the dry matter, and the total split lipoids (soaps and fatty acid) were 32.33%—an apparent combination of deficiency of both fat absorption and fat splitting. In four of the cases of Bennett, Hunter, and Vaughan (Cases 5, 6, 8, 9) there was a similar marked abnormality in the percentage of neutral fat; in Case 8 this amounted to 45.2% of the dried matter. The total lipoid percentage in all those cases was very high—over 50. The probable explanation—accepting Fowweather's criteria—is that in such cases there is a degree of deficient fat splitting, not due to any organic pancreatic disease. Probably the defective fat splitting is due to the rapid rate at which the food passes through the intestine and the consequent failure of the pancreatic ferments to exert their full action. In the present case, after treatment was instituted the percentage of neutral fat in the stools fell to 6.26%, a figure well within the normal limit.

2. The proportion of total lipoid in the stools after limitation of fat intake fell from 54.01 to 20.18%. In Case I limitation had the opposite effect on the percentage of total lipoid. In both cases, however, the actual amount of total lipoids and neutral fat fell sharply after treatment.

3. Two features in the treatment of Case II are of interest. Four courses of liver extract intramuscularly were given. As mentioned previously, some American workers have used liver extract alone in treatment for its supposed specific effect on the absorptive power of the mucous membrane of the small intestine, and without any reference to the blood picture. Mogensen (1937) justifies the use of liver extract injections in one of his cases with a hypochromic anaemia because of a decrease in the number of red cells together with the presence of megaloblasts. The blood picture in the present case was somewhat similar to that in Mogensen's case. The rapid response to treatment in Case II may possibly to some extent be due to this liver therapy.

The other feature of interest in the treatment concerns the amount of protein in the diet. Weir and Adams (1935) recommend a protein allowance higher than normal because the haematogenous "extrinsic factor" is contained in protein food and because there is frequently a negative nitrogen balance in Gee-Thaysen disease. Thaysen (1935)

declared that a relatively high nitrogen intake was essential for the maintenance of a positive nitrogen balance in idiopathic steatorrhoea; in a series of experiments on patients he maintained a positive balance on diets with a daily protein equivalent of 80 to 90 grammes. In both of our cases an allowance of about 2 grammes of protein per kilogramme of body weight was made, which meant that each patient received approximately 90 grammes of protein daily. A liberal protein intake is therefore apparently advisable in treatment.

I wish to express my thanks to Prof. Henry Moore for his suggestion to publish these two cases and also for his invaluable advice and criticism in the preparation of this paper.

PROFESSOR MOORE'S OBSERVATIONS

Little is known of the pathogeny of this interesting but complex disease. My own view is that in the great majority of cases the fundamental fault lies in imperfect absorption from the small intestine; in a small minority, however, lacteal obstruction may possibly play a part. The most important factor in the causation of the symptoms would seem to be imperfect lipoid absorption: the presence of the abnormal amount of lipoids in the bowel would appear to be to a large extent responsible not only for the diarrhoea but also for the imperfect absorption of calcium, phosphorus, haematopoietic bodies, and vitamins, in varying degrees in different cases. This view is supported by the following observation. We have been able to follow eleven of our twelve cases for from fourteen months to fifteen years—seven of them for over five years and two for over three years. After the initial period of some months on low-fat diet and "replacement" therapy seven of them remained in quite good health for prolonged periods on the low-fat diet alone. In addition to the low-fat diet, one took calcium gluconate, one took a few daily drops of haliverol, one had occasional doses of marmite, and one had occasional doses of dry vitamins; all four continued well for years. It is probable, therefore, that the chief factor in the production of disability in the Gee-Thaysen disease is the abnormally increased lipoid content of the bowel due to malabsorption of lipoids by the small intestine.

In the paper by Bennett, Hunter, and Vaughan (1932) it is stated that in adult and adolescent cases of idiopathic steatorrhoea the results of treatment in general are more disappointing than in children suffering from coeliac disease, and that, although some cases respond more satisfactorily than others, in the majority all that is accomplished is the alleviation of one or more symptoms and the temporary arrest of downward progress. Our experience, on the contrary, is that the results of treatment are most satisfactory, and this notwithstanding the fact that six of our twelve cases could be classified as very severe and four as severe; three of them had multiple pathological fractures, all of which healed under treatment. Of our twelve patients one died of the disease itself—this was a case seen in 1926 (Case 2 in our original paper), when we were not in a position to carry out the successful treatment elaborated later; one died of acute lobar pneumonia in 1936, but for three years from discharge enjoyed excellent health; and one died of pulmonary tuberculosis, symptoms of which appeared three and a half years after discharge from hospital. Of the nine cases surviving to date the results can be stated to be excellent in six (of which one was observed for fourteen months, one for two years, and the remaining four for from five to fifteen years) and good in three (all of these three cases were observed for over five years).

Accordingly, our belief is that treatment—which in the initial stages should be carried out in hospital, which must be individualized, and which may have to be continued for considerable periods—gives on the whole very satisfactory results.

POSTSCRIPTUM

Since the above note was written a paper by Bennett and Hardwick (1940) has appeared in which these authors, in relation to cases of "non-tropical sprue" in adults, state: "We find no justification for classing such cases with coeliac disease or for describing them, as has been done by H. Moore *et al.* (1936) and E. Mogensen (1937), as Gee-Thaysen disease." "This situation is not improved by the endeavour of Moore and others to identify the infantile cases with those appearing in later life to the exclusion of the tropical cases, for the cases arising in adult life resemble the tropical cases closely, but have only superficial resemblance to the infantile and adolescent ones."

It was precisely to bring out the difference between the infantile and the adult cases that we proposed the name Gee-Herter disease for the former and Gee-Thaysen disease for the latter. There are certain resemblances between the infantile and the adult cases, but there are also differences even whether the adult cases persist from infancy into adult life or arise in adult life: these symptomatological differences are probably due largely to the different age incidence and to the different mode of life led by the adult as compared with the child. Many adult cases in some respects resemble tropical sprue, but many do not—e.g., some cases of "non-tropical sprue" apparently beginning in adult life show marked osteomalacia and even fractures, whereas such conditions are not, so far as I am aware, found in tropical sprue. So far as I can understand their paper Bennett and Hardwick seem to wish to establish the close resemblance between cases of idiopathic steatorrhoea beginning in adult life and cases of tropical sprue. Resemblances there certainly are, but there are also notable differences. For example, as reported in our paper (Moore *et al.*, 1936), Cases 1, 5, and 10 (aged respectively 28, 29, and 63) had marked osteomalacia, with fractures in Cases 1 and 5; yet the onset, so far as could be judged from the history, did not begin in childhood and the symptoms did not closely resemble sprue. On the other hand, in Case 2 (aged 43), which did resemble sprue, the onset was probably in adult life, whereas in Case 6 (aged 40), which also resembled sprue, loose motions had been present since childhood. Again, Case I of the present paper did not resemble sprue, and the onset, judged by the roentgenological appearances of the bones, may have begun at about early adolescence, but could not be traced back to childhood.

The point raised by Bennett and Hardwick seems to be the nomenclature of those cases of "idiopathic steatorrhoea" which appear first in infancy and persist until adult life, and of those which first appear in adult life: are the latter more allied to tropical sprue than to coeliac disease? I confess that I do not believe we have enough exact information to give a definite answer to this question. There seems to be little doubt that the one aetiological factor running through (*a*) coeliac disease, either in infancy or persisting to adult life, (*b*) "idiopathic steatorrhoea" beginning in adult life, and (*c*) tropical sprue is, as Bennett and Hardwick put it, chronic jejunoileal insufficiency; but the manifestations of this deficiency might be different according to the age of the patient, the time of onset, the duration of the deficiency, the environment of the sufferer, and other factors. With a common fundamental defect it might not always be easy to say whether an adult case was more closely allied to tropical sprue than to infantile coeliac disease.

Gee (1888), describing the coeliac affection, wrote (italics mine): "There is a kind of chronic indigestion which is met with *in persons of all ages*, yet is especially apt to affect children between 1 and 5 years old"; and again: "The coeliac disease is commonest in patients between 1 and 5 years old; it often begins during the second year of life. Sometimes from India Englishmen return sick with the coeliac affection: seldom is it met with *in adults* who have never left our island." Gee therefore was almost certainly aware of the existence of adult cases of "non-tropical sprue" as well as of the infantile cases of coeliac disease and of tropical sprue. Tropical sprue was described before Gee's time. Gee's original paper was apparently forgotten until in 1906 Herter, in the U.S.A., gave a good account of the disease in children. Thaysen gave excellent descriptions of adult cases of idiopathic steatorrhoea in 1929 and 1932. With these facts in mind my co-workers and I (Moore *et al.*, 1936) wrote as follows:

"In the interest of clarity, and in order to give credit to those observers who have been chiefly instrumental in the recognition, description, or separation of these three interesting disease entities, we suggest that coeliac disease of children be called the Gee-Herter disease, that idiopathic steatorrhoea as it occurs in adults and adolescents of non-tropical countries be called the Gee-Thaysen disease, and that the name sprue be retained for the disease as it occurs in adult residents of tropical countries. It may be that a better nomenclature will become apparent as the obscurity at present surrounding the pathogeny and aetiology of the idiopathic steatorrhoeas becomes more clear. The name idiopathic steatorrhoea is not a suitable one, for steatorrhoea is common to all three and the term *idiopathic* is simply a *teleological confession of* ignorance; steatorrhoea, also, occurs under other conditions."

Bennett and Hardwick would probably argue that it is wrong to use the name Gee-Thaysen disease with reference to an adult case in which the disease began many years back in childhood and persisted into adult life, as well as for the case in which the malady first appeared in adult life or middle age; on the other hand, the symptomatology may not be quite the same in infancy as in adult life, even in those cases in which the disease originated in infancy and with persistence of symptoms into adult life, although not infrequently the resemblance may be close. In the latter case it is admittedly not wholly desirable to call a disease of infancy by one name and to use another when it persists to a later age. While we await the further information necessary for a final nomenclature Gee's name can be attached to both; in the infantile cases the name of Herter and in the adult cases that of Thaysen could be added to denote the changing symptomatology coincident with increasing age.

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I. S. Cormanschi (*Thèse de Paris*, 1940, No. 252), who records three cases in patients aged from 19 to 29, one of which is original, describes a disease characterized by the triad of iritis, genital ulceration, and buccal aphthae. The aetiology is still obscure. Recurrent iritis with hypopyon is found in both sexes. The genital ulcers and buccal lesions are slight. The ocular lesions as a rule consist not only of iritis or iridocyclitis but also of uveitis.

BLOOD AND PLASMA TRANSFUSION IN ALIMENTARY HAEMORRHAGE

BY

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The infusion of serum or plasma has been shown to exert a favourable effect not only in experimental shock in animals (Bond and Wright, 1938; Mahoney, 1938; Best and Solandt, 1940) but also in shock from burns (Trusler *et al.*, 1939) and wound shock (Edwards *et al.*, 1940) in the human subject. It has been argued that even in acute haemorrhage the absolute deficiency of red cells is of less importance than the vascular and circulatory derangement which prevents the effective access of blood to the tissues, and that the improvement of circulation following plasma infusion would outweigh the reduction in the number of red cells per unit volume of blood. If this were the whole story the ready availability of stored plasma and the absence of delay required to group the recipient would render it a valuable preliminary treatment of haemorrhage, even if it were necessary to give whole blood at some later time.

The object of this paper is to compare the effects of citrated whole blood with those of plasma in treating patients with massive bleeding from the stomach or duodenum. For a study of this type patients with haematemesis and melaena offer the advantages that the lesion causing haemorrhage is uniform in type, enabling a fair comparison to be made: reasonably good quantitative indications of the severity and progress of the case are given by measurements of the blood volume (Bennett *et al.*, 1938) and blood urea; and the indications for transfusion are comparatively definite. These last have been summarized by Witts (1937) as a pulse rate above 140, systolic blood pressure below 90 mm., blood urea above 100 mg. per 100 c.cm., or haemoglobin lower than 40%.

Clinical Material and Methods

The nine patients studied were all suffering from severe bleeding from the stomach or duodenum, and were kept at rest in bed on an adequate intake of food and fluid in the form of two-hourly feeds of milk and cream, with added vitamins. The first three were treated with massive transfusion of citrated blood by slow drip, and in one of them three transfusions of a litre or more were given. The fourth patient was treated with reconstituted dried serum in fourfold strength, but showed so severe an immediate reaction that this experiment was not repeated. In Cases 5 and 6 plasma infusion was started, but had to be supplemented straight away by blood transfusion; in Cases 7, 8, and 9 it was possible initially to give plasma alone, by slow drip, although Case 8 required whole-blood transfusion five days later. The plasma used was obtained by allowing blood of Group AB to stand in M.R.C. citrate bottles for forty-eight to seventy-two hours at 4° C., and aspirating the plasma into clean bottles with sterile precautions; it may be of importance that plasma so obtained is diluted bulk for bulk with citrate solution, and it may perhaps be best described as half-strength plasma.

In addition to observations on the general state of the patients, estimations of the blood urea were carried out

at intervals of a few hours on finger-prick blood, using the micro-method of Archer and Robb (1925); blood volume was estimated by the vital red method.

Haematological Findings

Whole-blood Transfusion.—The giving of whole blood is followed by an increase in the total amount of circulating red cells, as calculated from the plasma volume, directly determined by the dye method, and from the haematocrit on venous blood. The increase in red cell volume may correspond closely to the mass of red cells given in the transfused blood, as in Case 1, in which the cell volume increased by 0.4 litre after a transfusion of 0.8 litre of blood containing 0.35 litre of red cells. On the other hand, deviations from this conformity are sometimes greatly in excess of the limits of error of the method used—as carried out in normal subjects—where estimations on several consecutive days have agreed within ±0.1 litre. It is possible to account for instances in which the observed increase in red cell volume is less than the amount of red cells supplied by postulating continued haemorrhage, other signs of which may be present, such as rising pulse rate or fall in blood pressure. In Case 3, however, a transfusion containing 0.4 litre of red cells was followed by an apparent rise in red cell volume to 0.7 litre, a discrepancy which may be accounted for in the following way. The accuracy of the calculation of red cell volume depends on the extent to which the venous haematocrit reading is representative of the cell: plasma ratio in the whole mass of circulating blood: in conditions of shock, haemoconcentration may be present in the capillaries (McDowall, 1940), so that the plasma: cell ratio in the veins is higher than in the blood stream as a whole. In these circumstances the value for total blood volume, derived from the expression

$$\text{Blood volume} = \frac{\text{plasma volume}}{\text{venous plasma : whole blood ratio}},$$

is low, so that the first estimation of red cell volume is probably too low; while the second, made after the shock has been treated by transfusion, is more accurate, and the difference between the two estimations is thus accentuated in patients in whom capillary haemoconcentration has been prominent.

The changes in plasma volume after transfusion of whole blood are largely dependent on the extent to which the restoration of blood volume by plasma dilution has progressed by the time transfusion is carried out. When the plasma volume before transfusion has already risen to a normal amount, as in Case 1, little further increase is observed; but when dilution is incomplete before transfusion, as in Case 3, increase in plasma volume is observed even in excess of the volume of added plasma, since the improvement wrought in the circulation by transfusion enables the normal process of dilution to proceed at a more rapid rate. These findings are in accordance with the observations of Bock (1921) on the tendency to maintain or restore a normal plasma volume under widely differing conditions. The haematocrit and haemoglobin percentages and the red cell count were found to be raised in all cases when blood was given.

Serum or Plasma.—In the four patients to whom serum or plasma alone was given increments in plasma volume occurred. In No. 7, who had pronounced ill effects after the plasma infusion, the increase in plasma volume was 900 c.cm.—almost equal to the litre of plasma given; in Cases 8 and 9 the increase in plasma volume was only about half the amount of plasma given, and in them the ill effects were less severe. In No. 4, who received 140 c.cm. of four-times-normal serum, the increase in plasma volume was 300 c.cm., showing that some dilution had occurred: as it was not possible to estimate the blood volume immediately after the injection it is probable that dilution was complete but that some fluid was lost thereafter. In all four patients the estimated red cell volume after plasma infusion was within 100 c.cm. of the value obtained before infusion; there is therefore no evidence that plasma infusion in these patients effected any mobilization of red cells from the tissues, as it has been claimed to do (Brennan, 1940). Reduction of haematocrit percentage, haemoglobin concentration, and red cell count was found in the patients treated with plasma, and regeneration to the normal count from this lowered level appeared to be slower.

Blood Urea

The causes of the rise in blood urea observed after severe alimentary haemorrhage have been discussed at some length in another paper (Black and Leese, 1940); for our present purpose it is sufficient to state that the degree of elevation of blood urea bears a fairly close relation to the severity of illness, and that clinical improvement is accompanied by decline in the blood urea. A fall in blood urea after massive transfusion in haematemesis was observed by Wood (1936); but the changes in blood volume over the same period were not studied.

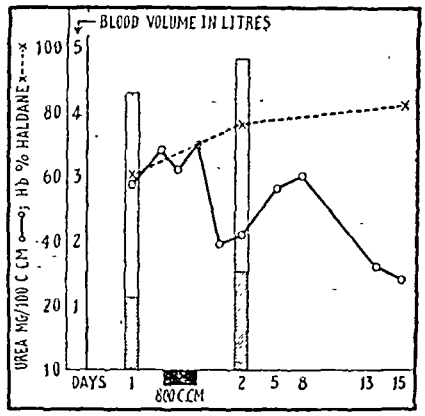


FIG. 1.—Blood volume, haemoglobin, and urea before and after blood transfusion in Case 1. The shaded area represents the total red cell volume.

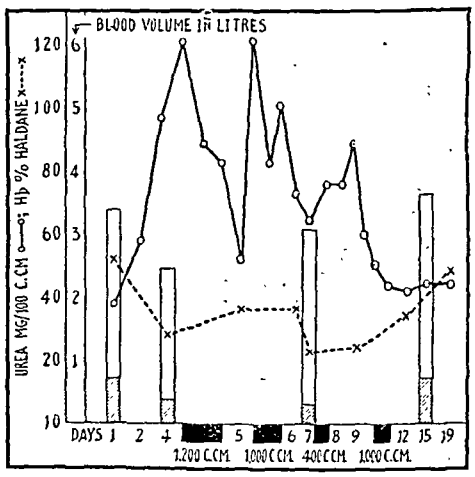


FIG. 2.—Blood volume, haemoglobin, and urea in relation to repeated blood transfusions in Case 2.

Whole-blood Transfusion.—The results in our patients, including those to whom blood had to be given after plasma, show that a fall in blood urea occurred after each of eight large transfusions of whole blood, carried out on six subjects; two other patients have shown a definite fall in blood urea after transfusion with citrated blood, but

are not included in the present series, since evidence of renal damage persisted after the acute haemorrhagic episode. In four of the eight transfusions here reported the blood urea was rising when transfusion was started, so the subsequent decline is not likely to have been spontaneous; moreover, it occurred with much greater rapidity than the decline in blood urea which is usually observed a few days after the haemorrhage. The time relation between transfusion, blood-volume increase, and decline in blood urea can be best seen in Figs. 1 and 2. A small and transient decline in blood urea was sometimes seen during the actual course of the transfusion, as in Cases 1 and 3 and in the second transfusion of those given in Case 2; but the major and lasting decrease in blood urea followed rather than accompanied the transfusion. The initial slight fall in blood urea may perhaps be attributed to dilution of azotaemic blood with blood of normal urea content; its transient nature can be accounted for by the rapidity with which urea diffuses from the tissues into the blood stream. The important fall in blood urea which occurs after the transfusion cannot be ascribed to dilution, and we believe that it depends on the increase in blood volume, which improves renal function, facilitating the removal of urea from the blood stream.

Serum or Plasma.—Four patients were treated with plasma or serum without any subsequent blood transfusion; in No. 4, who was given serum, the blood urea rose just after the transfusion, but fell slowly to normal in the next few days. In Case 9 the blood urea had fallen almost to normal before plasma was infused, and no further rise occurred. Cases 7 (see Fig. 3) and 8 each

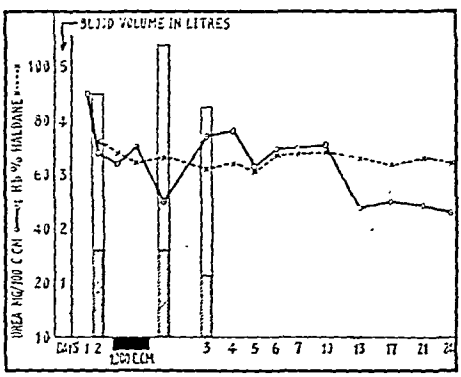


FIG. 3.—Blood volume, haemoglobin, and urea before and after plasma infusion in Case 7.

had azotaemia for more than five days after the infusion, in contrast with patients who had been given whole blood, and even with patients left to recover spontaneously from haematemesis. Plasma and serum therefore did not produce the same rapid fall in blood urea as did transfusion of whole blood.

General Effects

The beneficial effects of whole-blood transfusion in patients who have lost blood are well known. In the six patients who were given plasma immediate subjective or objective clinical improvement was absent; all showed some harmful effect, and in two of them the reaction was so severe that massive blood transfusion had to be used at once. The chief complaints during plasma infusion were of headache, faintness, and a vague sense of irritability. Objectively, increase in pallor, quickening pulse, and drowsiness leading to actual unconsciousness were noted; in the first patient, who had a low haemoglobin at the outset, unconsciousness persisted for over half an hour. Even after recovery from the immediate effects of plasma transfusion clinical improvement, and especially blood regeneration, were notably slower than in the patients to whom whole blood had been given; No. 4, who had serum, and whose plasma volume increased only by 300 c.cm., was an exception to this.

Discussion

Our experience has been that in patients suffering from alimentary haemorrhage plasma has not only been of no value as a substitute for whole blood in therapy, but has given rise to untoward and even dramatic ill effects. We have used plasma prepared in the same way in the treatment of burn shock, with good results and with no adverse reaction; it is therefore unlikely that any inherent defect of the plasma is responsible for the unsatisfactory response of patients with haemorrhage. Such patients are distinguished from patients with burn shock, who respond well to plasma, by the low content of haemoglobin in the blood. The most obvious effect of giving plasma is to increase the dilution of the formed elements in the blood, so that blood volume is increased at the expense of haemoglobin concentration. In this connexion the observations of Robertson and Bock (1918) in the war of 1914–18 are of great significance. They found that when the haemoglobin was below 40 to 50% spontaneous blood dilution did not occur; it seemed, in fact, that maintenance of haemoglobin at such a level was of more importance to the organism than restoration of the blood volume to full normal limits. It is reasonable to ascribe the ill effects of plasma infusion in patients with severe haemorrhage to the rapid and forced dilution of the blood to a greater extent than would naturally occur in response to haemorrhage. This interpretation is supported by the very rapid appearance of ill effects in patient No. 4, who received fourfold serum, and in whom blood dilution was likely to have occurred even more rapidly than with ordinary plasma.

It must be emphasized that plasma is of great value in the treatment of shock from such causes as burns and intestinal obstruction; when, however, shock is associated with a degree of haemorrhage sufficient to lower the haemoglobin percentage by a half or more, our results suggest that the giving of plasma is contraindicated, even as a temporary measure pending whole-blood transfusion. This conclusion does not conflict with the favourable results reported by Brennan (1940), since the lowest red cell count in his series was 2.99 millions: there is a stage of post-haemorrhagic shock, before blood dilution has occurred, when plasma infusion seems to be of value. When, however, the haemoglobin has fallen to 50% or less, as happens in many cases before the patient comes under observation, the time for plasma is past, and benefit will be obtained only from transfusion of whole blood. The practical recommendation we would wish to make is that any patient who is known to have bled should only be given plasma if the haemoglobin percentage is over 50; otherwise there is a risk of serious collapse, which may demand for its treatment an amount of whole blood larger than would have been required in the first instance. On the other hand, in recent haemorrhage, when dilution is slow on account of shock and the haemoglobin percentage remains high, plasma infusion is beneficial, as shown by the results of Brennan (1940) in patients and of Buttle *et al.* (1940) in animals.

Case Protocols

Case 1: Bleeding Peptic Ulcer.—This patient, a man aged 48, had had vomiting and dyspepsia for three weeks before admission for haematemesis on August 14, 1939. He was pale and shocked, with a blood pressure of 100/50, pulse rate 110, and temperature 98.4°. After transfusion of citrated blood, carried out on the day of admission, his blood pressure

became 110/70, and remained at this level. His pulse rate dropped to 80. Although he had a pyrexia of 102° F. on the day after transfusion his general condition was much improved. He made a good recovery, but had to be evacuated from hospital before full investigation had been carried out. The results of blood examination are as follows, and are also represented in Fig. 1.

Date and Time	Plasma Volume (litres)	Haema-tocrit %	Blood Volume (litres)	Blood Urea (mg./100 c.cm.)	Haemo-globin % (Haldane)	R.B.C. (millions per c.mm.)	W.B.C. per c.mm.
14/8/39							
3 p.m.	3.17	26	4.3	57	60	2.75	13,600
5 p.m.				68			
6 p.m.	Transfusion started						
8 p.m				62			
15/8/39							
2 a.m.	Transf. stopped (800 c.cm.)			69			
8 a.m.				39			
10 a.m.	3.3	31	4.8	42	76	3.44	8,800
18/8/39				56			
21/8/39				60			
26/8/39				32			
28/8/39				28	82		

Case 2: Bleeding from Gastric Ulcer.—The second patient, a woman aged 43, had had dyspepsia since 1926; gastro-enterostomy was done in 1929 for duodenal ulcer. She was admitted on September 25, 1939, having vomited blood repeatedly on that and the previous day. She continued to vomit in hospital, and her blood pressure, which had been 180/100 on admission, fell to 95/30 on the 29th, while her pulse rate rose from 90 to 130. She was given repeated transfusions of citrated blood, as detailed below, and showed temporary improvement after each, though she did not stop vomiting until October 4. A barium meal showed an ulcer high up on the lesser curvature, and this appeared at gastroscopy on November 1 to be in process of healing. The effect of the transfusions is indicated by the results given below and in Fig. 2; it is of interest that the small infusion of 400 c.cm. of blood produced no lowering of the blood urea.

Date and Time	Plasma Volume (litres)	Haema-tocrit %	Blood Volume (litres)	Blood Urea (mg./100 c.cm.)	Haemo-globin % (Haldane)	R.B.C. (millions)	W.B.C.
26/9/39 ..	2.7	20	3.4	38	50	3.14	9,800
27/9/39 ..				58			
28/9/39 ..	Arm–tongue circulation time (saccharin) = 7 seconds						
29/9/39							
11 a.m.	2.1	14	2.45	96	28	1.93	—
3 p.m.	Transfusion started			120			
6 p.m.				88			
10 p.m.	Transf. stopped (1,200 c.cm.)			82			
30/9/39							
9.30 a.m.				52	36		
12 noon	Transfusion started			120			
6 p.m.				82			
11 p.m.	Transf stopped (1,000 c cm.)			100			
1/10/39							
10 a m.		14.5		72	36		
2/10/39							
10 a m	2 8	9	3.1	64	23		
2 p.m.	400 c.cm of blood injected into cubital vein						
6 p m.				76			
3/10/39							
10 a.m.				76			
6 p m.				88			
4/10/39				60	24		
1,000 c cm. of blood given overnight by slow drip							
5/10/39				45	—		
6/10/39					34		
7/10/39				42	34		
10/10/39	2.9	20	3.6	44	42	2.47	
14/10/39				44	48		
20/10/39					50		
3/11/39					80	3.96	4,400
4/11/39	Arm–tongue circulation time (saccharin) = 17 seconds						

Case 3 Bleeding from Gastric Carcinoma.—Although dyspepsia had been present for seven years in this patient, a man aged 60, his pain had become more constant and severe in the month preceding his admission on November 6, 1939. He had small haematemeses while in hospital, but the first massive bleeding occurred on December 4, when he had three haematemeses of upwards of a pint each, and became pale, with a feeble pulse, the rate being 120 per minute. He was given a transfusion of a litre of citrated blood, with great improvement in his general state and a fall in the pulse rate to 80. A barium meal on December 19 showed the presence of a large mass involving the body of the stomach.

Date and Time	Plasma Volume (litres)	Haema-tocrit %	Blood Volume (litres)	Blood Urea (mg./100c.cm.)	Haemoglobin % (Haldane)
4/12/39					
4 p.m.	2.1	25	2.8	67	60
5/12/39					
9 a.m.				100	
11.30 a.m.	Transfusion started				
12.30 p.m.				146	60
4 p.m.				114	
7 p.m.				114	
10 p.m.	Transfusion stopped (1,000 c.cm.)			128	
6/12/39					
9 a.m.				102	
10 a.m.	3.5	28	4.9		64
12.30 p.m.				84	
4.30 p.m.				70	
7/12/39 ..				63	66
8/12/39 ..				62	62
9/12/39 ..				60	62

Case 4: Gastric Erosion.—This patient, a man aged 44, was admitted on May 10, 1940, after repeated small haematemeses which began the previous day. He was pale and shocked, with a pulse of 144 and a blood pressure of 82/60; epigastric tenderness was present. Two hours after admission reconstituted dried serum in fourfold concentration was given intravenously by syringe at a rate of 10 c.cm. a minute. After five minutes respiration quickened and deepened, the patient became restless, and he vomited twice. After 140 c.cm. had been given a convulsion occurred and the injection was stopped. For the next half-hour he was collapsed and semi-conscious, but could be roused. He was well on the following morning, apart from slight backache. The residue in the bottles used was found to be sterile. On May 11 his blood pressure was 114/65 and the pulse rate 98. Subsequent recovery was uneventful.

Date and Time	Haemoglobin (%)	R.B.C.(millions)	Plasma Volume (litres)	Blood Volume (litres)	Haematocrit (%)	Blood Urea (mg./100c.cm.)	Plasma Protein (gm./100c.cm.)	Plasma Albumin (gm./100c.cm.)	Plasma Bicarb. (vol./100c.cm.)	Plasma Chloride (mg./100c.cm.)
10/5/40										
3.30 p.m.	62	3.0	2.8	3.9	29	132	6.0	4.5	46	560
5 p.m.	Serum infusion begun					130				
5.15 p.m.	Serum infusion stopped (140 c.cm.)									
9 p.m.	50					152				
11/5/40										
10 a.m.	58	2.6	3.1	4.1	25	90	5.0	4.0	54	578
9 p.m.						62				
12/5/40 ..	58					44				
13/5/40 ..	44					44				
14/5/40 ..	50					35				
18/5/40 ..	52					38				
23/5/40 ..	60	3.0								
4/6/40 ..	74	4.0				34				

Case 5: Bleeding from Gastric Ulcer.—This patient, a man aged 38, was transferred from a cottage hospital, where he had been under treatment for haematemesis for six weeks. On admission to the Radcliffe Infirmary his pulse rate was 120, blood pressure 60/40, and haemoglobin 18%, and he appeared to be in shock. In spite of the low haemoglobin it was decided to give him plasma, since a good supply of compatible blood was available if his response to plasma were poor. After 300 c.cm. of plasma had been given at the rate of 200 c.cm. an hour he became unconscious, following some preliminary restlessness, and a change-over to blood was made. He then improved rapidly, and his blood urea fell in the usual fashion, as shown below. He was later transferred to a surgical ward, where gastro-enterostomy was done for relief of pyloric obstruction caused by a chronic gastric ulcer.

Date and Time	Plasma Volume (litres)	Haema-tocrit %	Blood Volume (litres)	Blood Urea (mg./100 c.cm.)	Haemoglobin % (Haldane)
4/2/40					
2.30 p.m.	4.25	9	4.67	76	18
3.30 p.m.	Plasma infusion started				
5 p.m.	Plasma infusion stopped (300 c.cm.)				
5 p.m.	Blood transfusion started				17
5/2/40					
10 a.m. ..	Blood transfusion stopped (1,200 c.cm.)			45	38
6/2/40 ..		17		37	36
7/2/40 ..				35	38
10/2/40 ..				28	40
20/2/40 ..	4.0	21	5.1	30	50

Case 6: Duodenal Ulcer.—This man, aged 58, had several haematemeses on August 6, 1940, and was admitted the next day at noon. He was pale and slightly cyanosed, with blood pressure 125/75 and pulse 146. A plasma infusion was begun, but the patient became restless and irritable, and looked much worse. Oxygen was administered with the B.L.B. mask, but did not appear to arrest the deterioration in his condition. His blood pressure fell to 100/46, and after a pint of plasma had been given a change-over to blood had to be made, and this was followed by the usual improvement. On August 8 his pulse was 100 and blood pressure 122 56. Recovery was normal, and he was discharged on September 20.

Date and Time	Plasma Volume (litres)	Haematocrit %	Blood Volume (litres)	Haemoglobin %	R.B.C. (millions)	Blood Urea (mg. /100 c.cm.)
7.8.40						
2 p.m.				30		120
4 p.m.	4.0	12	4.6	28	1.5	118
6 p.m.	Plasma drip begun					
8.30 p.m.				28		120
9.30 p.m.	Plasma replaced by blood after 500 c.cm. had been given					
12 p.m.				30		120
8.8.40						
11 a.m.						126
4 p.m.		16		38	1.73	72
10.8.40				40		
30.8.40				50	2.9	
14.9.40				70	3.8	
2/10.40				88		32

Case 7: Bleeding from Gastric Ulcer.—This man, aged 59, had had dyspepsia of gastric ulcer type since 1917; he had had slight haematemesis and considerable melaena for five days before admission to hospital on February 25, 1940. On admission he was pale and shocked, with blood pressure 90/50 and pulse rate 140. As his haemoglobin was 75%, it was decided to give him plasma; so between 12 noon and 5 p.m. on the 26th a litre of plasma was infused. The patient became confused and apathetic during the plasma administration, but consciousness was not lost. Following the plasma infusion there was no subjective improvement such as is normally brought about by blood transfusion in these cases. On the day after the infusion he felt better than he did immediately after, and blood-volume estimation showed that he had by that time lost the greater part of the increase in plasma volume brought about by the infusion. A barium meal on March 11 showed a chronic gastric ulcer with hour-glass deformity. The results of blood examination are as follows, and are shown also in Fig. 3.

Date and Time	Plasma Volume (litres)	Haematocrit %	Blood Volume (litres)	Blood Urea (mg. /100 c.cm.)	Plasma Protein (gm. /100 c.cm.)	Haemoglobin % (Haldane)	R.B.C. (millions)
25.2.40							
9 p.m.				90			
26.2.40							
11 a.m.	2.9	34.5	4.5	63	—	{70 (venous) 72 (capillary)	3.29 3.51
12 noon	Plasma infusion started						
2 p.m.				64		63	
4 p.m.				70		64	
5 p.m.	Plasma infusion stopped (1,000 c.cm.)						
6 p.m.	3.8	29	5.4	50	5.0	{63 (venous) 65 (capillary)	3.25 3.14
27.2.40							
3 p.m.	3.1	27	4.25	74	5.0	{64 (venous) 62 (capillary)	3.0 2.9
28/2.40				76		64	3.1
29.2.40				62		62	
1/3.40				63		68	
2/3.40				68		68	
5.3.40				71		68	
8/3.40	Plasma bicarb. 55 vol. %; Plasma NaCl 592 mg. /100 c.cm.			43		66	
12/3.40				50		64	
16/3.40				48		66	3.3
19/3.40				46		66	

Case 8: Bleeding from Duodenal Ulcer.—This patient, a man aged 56, had a seven-years history of dyspepsia, with occasional attacks of melaena. He had been passing dark stools for two days before his admission to hospital on February 26, 1940, and was very pale, with pulse rate of 100, blood pressure 90/45, and haemoglobin 56%. The next day he was given a litre of plasma over a period of three hours; there was a complete absence of improvement, and the pulse, which had been running at a level of 100, rose during the course of the infusion to 120, and remained at that level until the following day. The systolic blood pressure fluctuated between 90 and 120, and was 97 at the close of the infusion. Half an hour after beginning the infusion the patient complained of headache, but this was not severe. On March 4, since the haemoglobin was not rising, a blood transfusion was given, with definite improvement in the patient's subjective and objective condition, and he made a good recovery. A barium meal on March 12 showed deformity of the duodenal cap, although an ulcer crater was not actually demonstrated. The numerical values obtained are given below.

Date and Time	Plasma Volume (litres)	Haematocrit %	Blood Volume (litres)	Blood Urea (mg. /100 c.cm.)	Plasma Protein (gm. /100 c.cm.)	Haemoglobin % (Haldane)	R.B.C. (millions)
27.2.40							
10 a.m.				74		56	
12 noon	2.65	24	3.5	82	4.5	{56 (venous) 54 (capillary)	2.71 2.60
1.20 p.m.	Plasma infusion begun						
3 p.m.				106		40	2.33
4.20 p.m.	End of plasma infusion (1,000 c.cm.)						
6 p.m.	3.1	19	3.85	60		{46 (venous) 43 (capillary)	2.3 2.5
10 p.m.				74		36	
8.2.40							
12 noon	3.34	19	4.1	63	4.5	{42 (venous) 42 (capillary)	2.03 2.17
29.2.40				64		42	
1.3.40				53		40	
2.3.40				64		40	
4.3.40							
10.30 a.m.	3.57	21	4.52			36	2.41
11 a.m.	Blood transfusion begun						
2 p.m.				52		42	
4.30 p.m.	End of blood transfusion (1,000 c.cm.)			53		50	
5.3.40	3.4	23	4.42	33		48	
8.3.40	Plasma bicarb 61 vol. %			50		50	
	Plasma NaCl 555 mg. /100 c.cm.						
12.3.40				43		50	
16.3.40				40		54	
19.3.40				41		62	

Case 9: Duodenal Ulcer.—After melaena for two days and one attack of haematemesis this patient, a man aged 47, was admitted to hospital on September 16, 1940. His blood pressure was 124/76 and pulse rate 90; he was pale but did not appear to be suffering from shock. A plasma infusion was started at 7 p.m. on the day of admission. There was no severe reaction, but headache began three hours after the infusion started, and lasted for over twenty-four hours. On the day after plasma infusion the pulse was 85 and blood pressure 122/64. He made a good recovery, and was discharged on October 14.

Date and Time	Plasma Volume (litres)	Haematocrit %	Blood Volume (litres)	Haemoglobin %	R.B.C. (millions)	Blood Urea (mg. /100 c.cm.)
16.9.40						
3 p.m.				50		53
5 p.m.	3.5	18	4.3	46	2.1	
7 p.m.	Plasma infusion started					52
10 p.m.				38		74
17.9.40						
12.50 p.m.	Plasma infusion stopped after 1,000 c.cm. had been given					
10 a.m.				36		54
2 p.m.	4.0	14	4.7	33	1.6	39
18.9.40				36		42
24.9.40				46	2.3	39
5.10.40				54	3.1	
5.11.40	3.4	43	6.0	90	4.3	35

Summary

In nine patients with severe haemorrhage from the stomach or duodenum plasma compared unfavourably with whole blood in its effects on the blood volume and haemoglobin concentration. It did not lower the degree of azotaemia to the same extent as whole blood, and the general condition of the patients was adversely affected. It is suggested that the ill effects of plasma in these cases are due to forced dilution of the blood in excess of the limits within which blood dilution is favourable to recovery from haemorrhage. The circumstances which determine the usefulness of plasma in post-haemorrhagic shock are discussed: in general terms, plasma is contraindicated when the haemoglobin is less than 50%.

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AMPUTATIONS IN BED

BY

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Orthopaedic surgeons are proud, and justly so, of their aseptic operative technique. Consequently, when one of them advocates the performance of an operation in the patient's bed one can visualize the hackles rising. My apology and excuse is, "C'est la guerre," and the emergencies of war have forced us to modify the technique which in peacetime is rightly regarded as essential.

Air raids, the mechanization of the Army, and the intensified industrial output have caused a great increase in the numbers of injuries to the limbs. Motor-cycle accidents to dispatch riders have resulted in as many as sixty-one serious fractures in six months in one provincial hospital alone. These patients are often suffering from severe shock, and multiple injuries may be present. Prompt amputation of mangled limbs before adequate resuscitation is to be condemned. Nevertheless the patient may recover to a certain extent from the primary shock, and then his condition may degenerate into secondary shock as a result of extensive damage to the limb.

Indications for Amputation

The indications are: (1) severe compound fractures or crushed limbs that cannot survive owing to interference with the circulation; (2) infection by anaerobic organisms, with spreading gangrene; (3) laceration or crushing of soft parts to such an extent that (*a*) the presence of the limb is retarding recovery from or accentuating shock, or (*b*) the subsequent scarring will leave a useless limb.

Choice of the right moment to amputate is of paramount importance, and equally so is the execution of the operation with the least possible disturbance to the patient. Temporary suspension of continuous-drip transfusion, and transport to the theatre necessitating lifting the patient from the bed to the stretcher, from the stretcher to the theatre table, from the theatre table to the stretcher and back to bed again, often have a deleterious effect. There may also be difficulty in restarting the blood transfusion, which will certainly be necessary. Multiple injuries may render transport difficult or impossible. It may, of course, be possible to wheel the bed accompanied by the drip transfusion into the theatre, and in some hospitals, and in the absence of an overwhelming rush of casualties, this may be considered preferable. A mobile surgical team might have to perform an amputation in the patient's house. For these patients amputation in bed in the ward may be a life-saving measure, and it has been found that it can be quickly, smoothly, and expeditiously carried out if carefully planned beforehand and a formal technique is faithfully observed.

Technique

Essential Materials.—Samways' tourniquet, or Callandar's modification of same; large amputation knife; dissecting forceps; amputation saw; artery forceps; catgut or silk; sulphanilamide powder; vaselined gauze arranged as a dressing and laid on wool 8 in. by 8 in. and 1 in. thick; bandages; three strips of 2-in. strapping two feet long.

Anaesthesia.—Intravenous pentothal or cyclopropane. The former is to be preferred for ease of administration.

Assistants.—Three are required, apart from the anaesthetist, if available. Two is the minimum.

Operation.—Speed is desirable and often essential. An amputation through the lower third of the thigh is described, although the same technique can be adopted for any site. The guillotine operation is of course the method of choice in these severely shocked patients. The tourniquet is applied and kept in position by one assistant, who twists it round and holds it with his hands. Another assistant lifts the limb by the foot. Mackintoshes and towels are applied, and the incision is begun on the postero-medial aspect of the limb, continued over the front of the circumference of the limb, and carried down to the bone. The bone is quickly divided with a saw, the skin being pulled up as far as possible by pressure with the left hand. The femoral vessels are clamped and tied with silk or No. 2 catgut. An assistant then releases the tourniquet slightly, and any other strongly bleeding vessel is clamped and ligatured. The generalized ooze is ignored. The tourniquet is now held tight again, and sulphanilamide powder is dusted on to the raw area. Vaselined gauze and wool are then applied to the stump and firmly bandaged on. The dressing is further anchored in place by strapping, which passes over the end of the stump from the abdomen to the buttocks and from the inner to the outer aspect of the thigh. Below are given two illustrative cases.

Case I

A munition worker aged 18 became an air-raid casualty at 2 p.m. in August, 1940. The further history of his case is as follows:

3.15 p.m.—Admitted to hospital in fairly shocked condition. Blood pressure 120/80. Pulse 80, good volume. Talking clearly and well. Compound comminuted fracture of head of tibia. Morphine given and anti-shock treatment instituted.

4.15 p.m.—Plasma transfusion given preparatory to operation.

4.30 p.m.—Condition degenerating. Cold, perspiring, and cyanosed. Blood pressure 95/60. 6 litres of oxygen given with B.L.B. mask.

9 p.m.—Condition much worse. Blood pressure 85/50. Pulse rate risen from 100 to 160. Blood transfusion administered.

11 p.m.—Amputation through lower third of thigh performed in bed.

11.10 p.m.—Immediately after operation blood pressure 70/40.

Next day, 12.30 a.m.—Blood pressure 80/60. Pulse 140.

8.30 a.m.—Blood pressure 120/80. Pulse 120. Steady gradual improvement followed.

Case II

An R.A.F. dispatch rider aged 24 had a motor-cycle accident at 8.30 a.m. on November 15, 1940. His case proceeded as set out below.

November 15, 11.30 a.m.—Admitted to hospital with severe shock. Compound comminuted fracture of tibia and fibula plus fractured pelvis. Large wound with extensive laceration of soft parts. Pulse 100—irregular and of poor volume. Resuscitation started at once.

4 p.m.—Condition improved. Complete excision of wound, sulphanilamide pack, vaselined gauze, immobilization on Thomas splint with pins above and below fracture.

November 16.—Condition fairly good. Pulse still irregular —100 and poor volume.

November 17.—Definitely improving. Pulse still irregular. At 10.30 p.m., pulse 130. Wound examined. No local evidence of gas infection.

November 18. 3.30 a.m.—Pulse 120 Some crepitus in region of wound. Toes cold though not gangrenous. Plasma with 6 c.cm. of sulphapyridine and 20,000 units of polyvalent anti-gas-gangrene serum given.

6 a.m.—Asthmatic attack. (Patient subject to recurrent asthma.) Pulse 160. Oxygen given with B.L.B. mask. Adrenaline 80 minims given slowly and intramuscularly. Gross gas infection of leg present.

8 a.m.—Slight improvement in general condition, but gangrene spreading.

9 a.m.—Extensive gas gangrene below knee. Asthma controlled, but pulse still 130 and general condition very poor indeed. Blood transfusion given. Amputation through lower third of thigh in bed.

1.30 p.m.—Pulse 96. Condition improved. Steady gradual improvement from this stage.

All my colleagues and I feel certain that if either of these patients had been moved from his bed or from the ward his chances of recovery would have been seriously diminished.

Summary and Conclusions

It is suggested that the performance of amputations in the patient's bed, in the ward, the theatre, or his own house, may be the deciding factor in saving life, since the operation can be done with the least possible disturbance to the patient.

A simple technique for amputations in bed is described.

DOUBLE INFECTION OF THE MENINGES WITH MENINGOCOCCUS AND GAERTNER'S BACILLUS

BY

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The following case seems worth recording for two reasons—first, because it is extremely uncommon for a child to recover from one variety of meningeal infection only to fall a victim to another; secondly, because the type of meningitis which proved fatal is in itself comparatively rare. The primary infecting strain was meningococcus, the secondary *Bact. enteritidis* (Gaertner's bacillus).

Clinical Summary

A female infant aged 14 months was admitted to the Royal Hospital for Sick Children on June 16, 1940. She had been well until three weeks previously, when she became feverish, listless, and drowsy, began to refuse feeds, and vomited on several occasions. On June 15 the child had a convulsion. On admission to hospital she was flushed, with staring eyes, and had a marked "meningeal" cry. There was evidence of increased intracranial pressure, so lumbar puncture was performed. The fluid was under slightly increased pressure and was turbid: the cell count was 630 cells per c.mm., and films showed that these were both polymorphonuclear and lymphocytic. Meningococci were seen, mostly lying free, though a few were intracellular. On culture a heavy pure meningococcal growth was obtained. The child was transferred to Ruchill Fever Hospital on June 17. There the above findings were confirmed. Blood culture was negative. Treatment with sulphathiazole was instituted, and she received 20 c.cm. of sodium sulphathiazole intramuscularly and 0.75 gramme of sulphathiazole four-hourly by mouth. Lumbar puncture forty-eight hours after admission showed a clear fluid in which no meningococci were found in smears or on culture. She received 26.5 grammes of sulphathiazole in eight days, when the drug was stopped. The temperature settled within forty-eight hours of starting treatment, and progress was uneventful for almost a fortnight. On July 2, however, it was noticed that the patient was fretful and that the eyes were staring and wild-looking. There was occasional twitching of the eyes. Examination showed a paralysis of conjugate upward movement of the eyes and of conjugate movement to the right. The pupils were semi-dilated and did not react to light. An internal hydrocephalus was suspected. On July 8 there was a sudden rise of temperature to 107° F., and lumbar puncture was performed. Films showed abundant motile Gram-negative bacilli, and these were obtained in pure culture, the growth on MacConkey plates consisting of non-lactose-fermenting colonies. The child died twenty-four hours later. Necropsy showed fine adhesions between the pia and arachnoid, with considerable flattening of the convolutions. There was much inflammation of the surface of the brain, over which was a thin purulent exudate, mainly vertical. The ventricles were greatly dilated and contained thin purulent fluid.

Bacteriology

Cultures yielded a pure non-lactose-fermenting growth similar to that already obtained from the cerebrospinal fluid. Several colonies subcultured produced acid and gas in glucose, mannite, maltose, and dulcite, and failed to ferment lactose and saccharose. No indole was formed. A polyvalent Salmonella antiserum (Oxford standards) agglutinated cultures to titre. The strain was then tested against the various O (somatic) antisera of the Salmonella group, when agglutination occurred with *Bact. typhosum* O antiserum. This fact, taken in conjunction with the fermentation reactions, suggested that the strain was a member of the *enteritidis* group, which shares with *Bact. typhosum* the O antigens IX and XII. A further series of biological tests similar to that employed by Guthrie and Montgomery (1939), was next undertaken, the unknown Ruchill strain being tested in parallel with a known culture of *Bact. enteritidis* and of its closely related Dublin variant. The Ruchill culture behaved in every respect like the *Bact. enteritidis* strain. Confirmatory serological tests were then performed, when an antiserum prepared to the Ruchill strain agglutinated the homologous organism and several known *enteritidis* cultures to approximately the same high titre. Similarly a stock *enteritidis* antiserum agglutinated in high and approximately similar dilutions several known *enteritidis* strains and the Ruchill organism. Finally, the flagellar antigenic formula of the Ruchill culture was determined by the method of Kauffmann (1935–6). As already stated, it possessed the O (somatic) antigens IX and XII. Its H (flagellar) antigens were found by performing direct agglutination tests with antisera containing individual flagellar antibodies, employing the procedure described in detail by Guthrie and Montgomery. In common with various stock *enteritidis* cultures tested in parallel the Ruchill organism was found to possess the flagellar fractions g and m. Thus the serological, like the fermentative, reactions were those of a true *enteritidis* strain. The organism proved toxic for a rabbit, which succumbed within forty-eight hours of receiving an intravenous inoculation of 1/10 of a fresh agar culture suspended in saline. At necropsy the infecting strain was recovered in pure heavy growth from the heart blood, swollen spleen, and bile. The intestinal contents also were heavily infected.

Discussion

Few examples of double meningeal infection such as ours are to be found in the literature. A closely similar case is that reported by Opitz (1919) in a child of 15 months in whose cerebrospinal fluid meningococci alone were present originally. Subsequently Gram-negative bacilli appeared in films of the ventricular fluid, and a strain later identified as *Bact. enteritidis* was obtained on

culture. Welcker and Vogl (1938) also record a double infection of the meninges. Their patient, a female infant, was admitted to hospital with meningococcal meningitis, which improved under treatment; but a relapse occurred after a fortnight, when a Salmonella strain—in this instance *Bact. typhi murium*—was obtained in pure culture from the cerebrospinal fluid during life and at necropsy. Ravitch and Washington (1937), in the case of a 4-year-old girl, isolated meningococcus in pure culture from both the cerebrospinal fluid and the blood on the day of admission to hospital. A second blood culture taken twenty-four hours later gave a pure growth of *Bact. suipestifer* (the hog-cholera bacillus), and on the fourth day this organism alone grew from the cerebrospinal fluid. The authors considered, however, that as the spinal fluid was grossly contaminated with blood in the course of withdrawal the *suipestifer* strain may have been introduced in this way. Reid and Lipscomb (1940) saw streptococcal followed by pneumococcal infection after an interval of some months in a girl of 17. Both attacks of meningitis complicated mastoiditis.

A possible explanation of such double infections may lie in the fact that a primary inflammation of the meninges, by affecting the local capillaries and increasing the permeability of the endothelium, may predispose to a secondary meningeal infection. Burrows (1932) collected numerous instances of the localization of bacteria in injured or inflamed areas, which thus show lessened resistance.

Apart from its association with meningococcus, *Bact. enteritidis* as a cause of meningitis is of interest for its own sake, since organisms of the Salmonella group are among the rarer meningeal invaders. Comparatively few records of Salmonella meningitis are extant in the literature, and of these the great majority have appeared within the last decade. Most of the reports describe single examples, but series of collected cases are published by Lynch and Shelburne (1930), Bahrenburg and Ecker (1937), and Guerra *et al.* (1940). The last-mentioned authors' series is the largest, numbering 60 cases. Various Salmonella types have been incriminated—*Bact. paratyphosum* A (Eckert, 1910); *Bact. paratyphosum* B (Voigt, 1922; Brahdy, 1925; Anderson, 1932); *Bact. suipestifer* (Boycott and McNee, 1936; Clifton and Werner, 1938); *Bact. aertrycke* (Aballí *et al.*, 1937); *Bact. panama* (Katsampes and Bradford, 1940). Although these examples show that the Salmonella group as a whole possesses considerable powers of invasion, two members in particular are believed to have a special predilection for the meninges—*Bact. enteritidis* and *Bact. enteritidis* var. Dublin. Guthrie and Montgomery during a recent outbreak of *enteritidis* infection in young infants saw 10 cases with frank purulent meningitis due to this organism and 1 caused by the Dublin bacillus. They quote other examples.

The most striking fact concerning Salmonella meningitis which emerges both from our personal experience and from a survey of the literature is its marked tendency to affect infants—especially those in the neonatal period—rather than older children or adults. Nearly all the single case reports quoted concern babies under the age of 1 year, in whom meningitis was a sequel to Salmonella invasion of the blood stream, which occurs more readily in very early life than at any other age period. In fact, in young infants Salmonella infections tend to produce lesions quite distinct from those typically seen in adults. Similarly, young animals of various species are particularly susceptible to Salmonella infections (Hormaeche, quoted by Zerbino *et al.*, 1940), and septicaemia with purulent complications due to the Dublin bacillus has been described in young calves by Bosworth and Lovell (1931).

Infection apparently enters by way of the alimentary tract. Gross intestinal lesions do not, however, necessarily precede invasion of the blood stream. Sometimes, in fact, the gastro-intestinal tract appears normal, as in the present instance and in the cases of Symmers and Wilson (1908–9), Smith (1921), and Pesch (1926). Also Guerra *et al.* (1940), who with others have extensively investigated Salmonella infections in Uruguay within recent years, found evidence of enteritis only in the minority of their fatal cases. They suggest that, as in other meningeal infections, the portal of entry is pharyngeal, with subsequent invasion of the blood stream and localization in the meninges.

The origin of the *enteritidis* strain was not discovered in our case. As the organism was isolated from our patient for the first time three weeks after admission to hospital it was thought possible that she might have been infected from another patient. Specimens of faeces from all the other inmates of the ward were therefore examined, but all were negative. Inquiry elicited no history of diarrhoeal disease either in the child's family or in any member of the nursing staff before the onset of her illness. In infants contaminated cows' milk must be considered a likely source of Salmonella infection, particularly in the case of *Bact. enteritidis* and the Dublin bacillus, since these strains are among the commonest Salmonella invaders in cattle (Bosworth and Lovell, 1931), and at least two epidemics have been traced to infected milk (Kinloch, Smith, and Taylor, 1926; McAllan and Howie, 1931). In the present case the milk supply could be excluded as a source of infection, since it was a bulked certified milk and was supplied to a large number of infants without mishap. The source of sporadic Salmonella infections often remains obscure, and difficulty in incriminating milk or some other article of food as a vehicle of infection may depend partly at least on the varying resistance of those consuming it, since even a small inoculum may produce disease in subjects so peculiarly susceptible as young infants, while a much larger dose may be borne with impunity by older individuals.

Summary

A case of double meningeal infection in a child is reported and the bacteriology of the condition is discussed.

The literature is given of the few other cases that have been placed on record.

We are indebted to Dr. W. M. Elliott, medical superintendent, Ruchill Hospital, for permission to use the case record.

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A COMPARISON OF RESULTS OF SURGERY AND RADIOTHERAPY IN CARCINOMA OF THE CERVIX UTERI

BY

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This series of 179 cases of carcinoma of the cervix shows the five-year results obtained in all patients suffering from this disease who were seen at the Middlesex Hospital during the years 1931–4 and who had received no previous treatment. They afford material for comparing the various methods of treatment adopted. These patients have been treated surgically by several members of the surgical staff, and by radiotherapy by the radiotherapy staff of the Meyerstein Institute of the Middlesex Hospital. We are indebted to them for permission to study and report their results.

The importance of the series is that it gives the results obtained from the total number of cases of carcinoma of the cervix undergoing treatment at a single hospital when both surgical and radiotherapeutic methods have been available. Each patient was seen in the first instance by a surgeon with a view to the performance of Wertheim's hysterectomy, and only those cases which were inoperable by reason of the extent of the growth, of age, or of general condition were referred for radiotherapy. In two cases radiotherapy was given because operation was refused. Sixty-four were treated by surgery, 104 by radiotherapy, and 11 received no treatment.

The surgical cases consisted of 59 patients treated by surgery alone and 5 to whom post-operative *x*-radiation was given in addition. The radiotherapy cases were made up of 87 patients treated by a combination of radium and *x* rays, 14 treated by radium alone, and 3 treated by *x* rays alone. The 11 cases untreated consisted of 1 patient who refused treatment and 10 who, either on account of widespread dissemination of the growth or because of their hopeless general condition, were considered to be too advanced even for palliative measures.

The surgical operability rate was 64 out of 179 cases—i.e., 35.7%. The radiotherapy treatment rate was 104 out of 115 cases—i.e., 90.4%. Eleven cases (6.1%) were untreated. The average age of the patients was 53.5 years, the youngest being 31 and the oldest 80. There were 9 nulliparous women in the series (5%), and one of these was clinically a virgin. Histological confirmation of the diagnosis was obtained in 159 out of the total of 179 cases, but such confirmation was obtained in every patient but one of those who survived five years. There were 152 cases of squamous-celled carcinoma and 7 of adenocarcinoma. All the patients treated have been kept under continuous observation for more than five years, with the exception of two who could not be traced.

Classification of Cases

The series of patients treated by radiotherapy has been divided into the four stages of the League of Nations classification, which is as follows:

Stage 1.—The growth is strictly limited to the *cervix uteri*. Uterus mobile.

Stage 2.—Lesion spreading into one or more fornices with or without infiltration of the parametrium adjacent to the uterus, the uterus retaining some degree of mobility.

Stage 3.—(*a*) Nodular infiltration of the parametria on one or both sides extending to the wall of the pelvis, with limited mobility of the uterus or massive infiltration of one parametrium with fixation of the uterus. (*b*) More or less superficial infiltration of a large part of the vagina with a mobile uterus. (*c*) Isolated metastases in the pelvic glands, with a relatively small primary growth. (*d*) Isolated metastases in the lower part of the vagina. [Generally speaking, all cases not falling into Stage 2 or 4 will be placed under Stage 3.]

Stage 4.—(*a*) Cases with massive infiltration of both parametria extending to the walls of the pelvis. (*b*) Carcinoma involving the bladder or rectum. (*c*) The whole vagina infiltrated (rigid vaginal passage), or one vaginal wall infiltrated along its whole length with fixation of the primary growth. (*d*) Remote metastases.

The League of Nations classification has not been used for the surgical series, which has been divided into two groups according to the results of histological examination of the glands removed at operation: (1) glands free from carcinoma: (2) glands invaded by carcinoma. It was often found at operation that patients clinically belonging to Stages 1 and 2 of the League of Nations classification had invasion of the glands and, conversely, that patients having extensive local growth had no invasion of the glands.

Results

Results have been assessed in terms of five-year survival rather than of cure. This has been done in order to avoid any difficulty in the interpretation of the significance of residual pelvic thickening following treatment. In fact, all the 26 survivors in the radiotherapy group remained free from signs or symptoms of disease during the five years following the completion of their single course of treatment. During the sixth year one patient developed lumbar pain without definite evidence of recurrence. She received a course of *x*-ray treatment, and now remains well, two years later. Of the 23 patients who survived five years following surgical treatment 2 had signs of recurrence of the growth during the fifth year and have since died.

TABLE I.—*Wertheim's Hysterectomy*

	No. Treated	Died of Operation	Died of: Cancer	Died of: Other Causes	Untraced	Five-year Survival
Glands not invaded	46	6	16	3	2	19 (41.3%)
Glands invaded ..	18	5	8	1	0	4 (22.2%)
Total	64	11 (17.2%)	24	4	2	23 (36%)

Five of the patients in Table I were given post-operative *x*-ray treatment. We can find no indication for the selection of these patients, as 3 had no glandular involvement and in 2 the glands were involved. They all died before the end of the five-year period.

TABLE II.—*Radiotherapy*

	No. Treated	Treatment Mortality	Died of: Cancer	Died of: Other Causes	Untraced	Five-year Survival	
Stage 1	12	0	5	0	0	7 (58.3%)	44.4% / 35.3%
,, 2	13	1	7	1	0	4 (31%)	
,, 3	43	2	27	1	0	13 (30%)	
,, 4	36	2	32	0	0	2 (5.5%)	
Total	104	5 (4.8%)	71	2	0	26 (25%)	

The routine method of radiotherapy used has been the combination of the insertion of radium to the uterus and vagina by the Paris technique, and the application of *x* rays to the parametria. Eighty-seven patients were treated by this method. Before the adoption of this routine 14 cases were treated by radium alone. At this time a modification of the Stockholm technique was employed. Only one of these patients survived the five-year period. Three were treated by *x* rays alone as a palliative measure because their condition was so bad that radium could not be applied. Two of them died during the course of treatment, and the third shortly after it had finished.

Combined Results of Surgery and Radiotherapy.—Out of the 179 who applied for treatment 49 survived five years—i.e., an absolute survival rate of 27%. If from the 179 patients deductions are made of those untreated (11), those untraced (2), and those who died of other causes while free from disease (6), the relative survival rate is 49 out of 160 cases—i.e., 30.6%.

Discussion

With the two methods of classification employed it is difficult to compare accurately the results obtained by surgery with those obtained by radiotherapy, but such comparison is still of value. Even though cases treated by radiotherapy which are clinically Stages 1 and 2 may have glandular invasion, a comparison of these groups with the surgical gland-free cases shows 44% five-year survivals treated by radiotherapy as against 41.3% of the surgical cases.

The surgical cases with glands may be compared with the Stage 3 (*c*) radiotherapy cases—i.e., "isolated metastases in the pelvic glands with a relatively small primary growth." Almost all the remainder of the Stage 3 radiotherapy cases must be regarded as inoperable, as can be seen from the relatively large number considered unsuitable for surgery and referred for radiotherapy. Nevertheless, comparison of the results of all the Stage 3 radiotherapy cases of every category with the "gland-invaded" surgical cases shows 30% of five-year survivals from radiotherapy and 22.2% of five-year survivals from surgery.

If the cases in Stages 1, 2, and 3 treated by radiotherapy are compared with all the surgical cases, both "gland-free" and "gland-invaded," then the figures show 35.3% five-year survivals from radiotherapy and 36% of five-year survivals from surgery—an approximately equal figure; but there were 63% of Stage 3 cases in the radiotherapy figures and only 28% in the surgical figures.

These results were obtained with an operative mortality of 17.2% in the patients treated by surgery and with a treatment mortality of 4.4% in the patients receiving radiotherapy. In this series, moreover, consideration must be given to the fact that the results of radiotherapy were obtained in patients who had previously been rejected by a surgeon as unsuitable for surgery either on account of extent of growth or of poor general condition. The material for radiotherapy was therefore much inferior to that treated surgically, and allowance must be made for this in any comparison of these two methods of treatment based on this series.

Conclusions

In technically operable cases of carcinoma of the cervix a higher percentage of five-year survivals has been produced by radiotherapy than by surgery.

This result has been obtained with a much lower treatment mortality.

In technically inoperable cases of carcinoma of the cervix a small percentage of five-year survivals has been obtained by radiotherapy.

Clinical Memoranda

Friedländer Pneumonia successfully treated with Sulphapyridine

The following case is an example of a rare type of acute lobar pneumonia which is not widely recognized in this country and is therefore probably often overlooked. Its signs and symptoms have been well described in two series of cases in America (Bullowa *et al.*, 1937; Solomon, 1937), and there can be no doubt that it is a distinct clinical entity. It is characterized by profuse slimy brightly blood-stained sputum containing a pure culture of Friedländer's pneumobacillus, pronounced toxaemia, and a very high mortality (83% in the first series mentioned and 97% in the second). If the patients survive long enough septic complications such as lung abscess or empyema usually develop.

Case History

The patient, a man aged 43, was admitted to the Western General Hospital, Edinburgh, in March, 1939. He had been ill for five days with a cough, and during the past three days had been bringing up large quantities of slimy sputum which was heavily blood-stained. On examination he was very collapsed. There were typical signs of consolidation of the right lower lobe; this was confirmed by radiograph. His temperature was 100° F., and the white blood count was 8,000 per c.mm. His sputum, which was quite unlike the usual rusty sputum seen in acute lobar pneumonia, contained many Friedländer pneumobacilli but no other organisms. Blood culture was negative, and remained so.

He was immediately given four 0.5-gramme tablets of sulphapyridine, and four more two hours later, and then two tablets four-hourly. His temperature fell to normal in forty-eight hours, with marked clinical improvement, but rose again after a further twenty-four hours, and two days later he developed a right-sided empyema. The pus contained a pure growth of Friedländer's pneumobacillus. He was treated by rib resection and drainage, and made an uninterrupted recovery. Sulphapyridine was stopped six days after admission, a total dosage of 32 grammes having been given.

Discussion

In a disease with such a mortality the mere survival of a patient following use of sulphapyridine suggests that the drug is potent against the bacillus. This was supported by the rapid clinical improvement in the early stages of treatment. The development of an empyema does not indicate that the drug was without value, as such a development is common in acute pneumococcal lobar pneumonia, in which the value of the drug is of course undoubted.

I have been unable to trace any other detailed report of treatment of a similar case, but Long and Bliss (1939) have had good results in experimental infections in mice, and they recommend the use of the drug in any Friedländer infection in man. Meyer and Antman (1939) report the successful treatment of a case of septicaemia due to the bacillus, the source of infection being unknown.

It is obviously impossible to generalize from one case, but it is hoped that mention of it may help to draw attention to the existence of this interesting condition and to the possibility of its successful treatment.

My thanks are due to Prof. Stanley Davidson for permission to publish this case.

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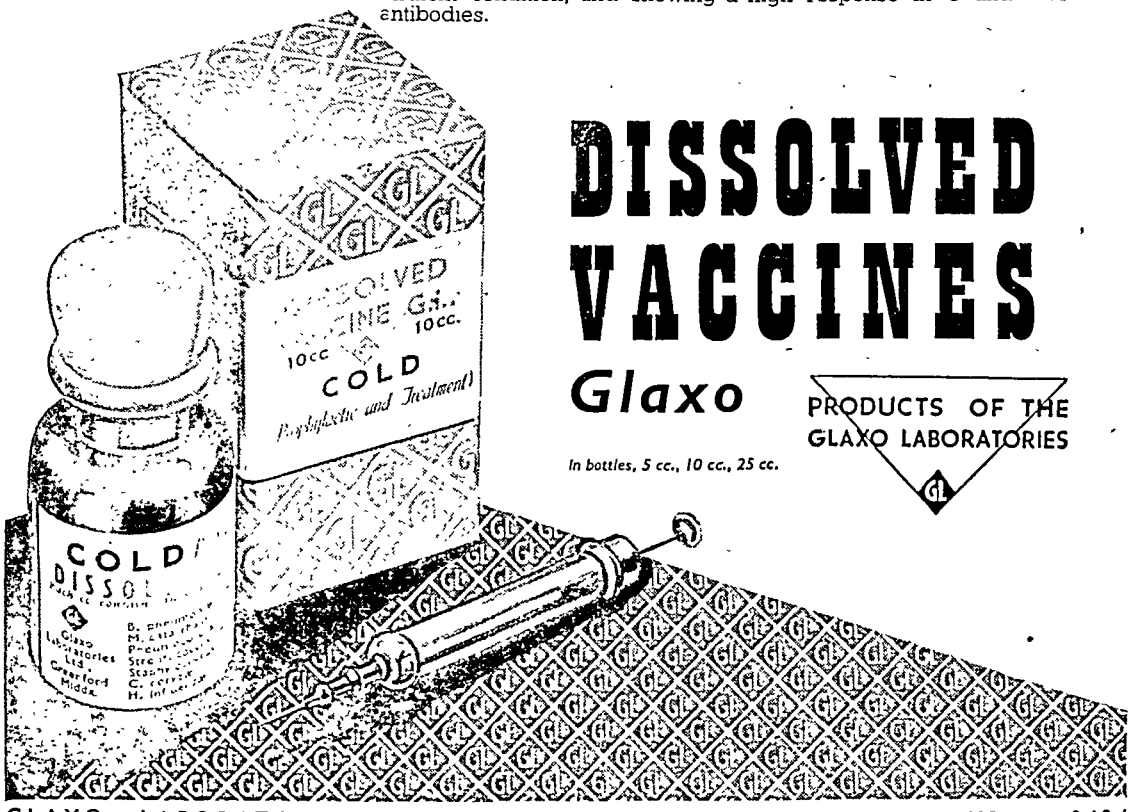
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Reviews

POSTGRADUATE LECTURES IN MEDICINE

Edinburgh Post-Graduate Lectures in Medicine. Volume I. 1938–9. By Various Authors. (Pp. 513. 10s. 6d. net.) Edinburgh and London: Published for the Honyman Gillespie Trust by Oliver and Boyd. 1940.

The high standard of clinical teaching has earned the Edinburgh School of Medicine a great reputation in the past. Since 1906 the growing need for postgraduate instruction has been met by holding vacation courses, and such three-weeks courses arranged for general practitioners have been highly successful and well attended. For two years before the war a more prolonged period of postgraduate training had been arranged and full numbers of entries were obtained. It is likely that further facilities will be needed and offered. Towards the cost of this a grant has been made by the Honyman Gillespie Trustees and a first series of lectures is published in a convenient volume, being reprinted from the *Edinburgh Medical Journal*. It is prefaced by a summary of the aims and attainments of the Postgraduate Executive Committee by its chairman, Dr. Edwin Bramwell, whose subsequent lecture on the pupil reactions is a model of clarity with a proud account of the contributions of alumni of the Edinburgh school to knowledge of the subject. Robert Whytt described the reactions of the pupil to light and the consensual reaction; T. R. Fraser discovered the myotic action of physostigmin; Douglas Argyll Robertson is specially remembered in relation to the pupillary sign which bears his name; while recently S. A. Kinnier Wilson and W. J. Adie have in their writings thrown further light on pupil problems. Other lectures on the nervous system deal with the visual path and its interruptions by disease, and with other problems of neurology, especially the syndromes of deficiency disease, and recent work on myasthenia and myotonia.

Specialists have contributed to bring together an admirable survey of recent advances and attainments in medicine, including circulatory problems by Prof. Ritchie and Dr. Rae Gilchrist, chest complaints by Dr. Fergus Hewat, Prof. Christie, and Prof. McNeil, renal disease by Prof. Lyon and Dr. Cameron, and hepatitis by Prof. McNee. A wide range of surgical subjects includes consideration of malignant disease of the colon by the late Sir David Wilkie and of the acute abdomen in children by Dr. Gertrude Herzfeld, while Prof. Illingworth gives an account of recent developments in the surgery of obstructive jaundice and the factors concerned in the causation and control of haemorrhage during and after operation. Prothrombin deficiency, which is the basis of the diminished clotting power of the blood, is found in two distinct conditions—jaundice and biliary fistula—suggesting that the deficiency may be due to faulty absorption of some substance from the intestinal tract owing to the lack of bile; favourable reports have been submitted on the value of intramuscular injection of vitamin K. Other surgical problems dealt with are cancer of the breast, toxic goitre, cancer of mouth and jaws, the results of ureteral transplantation, and the treatment of haemorrhoids.

Other subjects of general interest are the development of physical education and assessment of capacity for exercise and even some vocational guidance attained in the last ten years by the new Department of Physical Education; the advantages of occupational therapy among convalescent and chronic patients and the feeble-minded; and especially a sound and wise consideration of the use of intelligent psychotherapy in general practice by Dr. T. A. Ross. The volume is a good addition to the practitioner's library.

DENTAL ANAESTHESIA

Essentials of General Anaesthesia: With Special Reference to Dentistry. By R. R. Macintosh, M.A., M.D., F.R.C.S., D.A., and Freda B. Pratt, M.D., D.A. (Pp. 324. 25s. net.) Oxford: Blackwell Scientific Publications Ltd. 1940.

Any book written by the Nuffield Professor of Anaesthetics and his first assistant would compel attention, and this one certainly deserves it. In order to avoid disappointment the subtitle of this volume should be remembered, and it will then be realized that it is not meant to be a textbook on anaesthetics as a whole. The groundwork of the subject is covered, but detailed techniques are given for dental anaesthesia only. A short historical summary is followed by an excellent and up-to-date account of the theory and signs of general anaesthesia. Premedication and full details of every method applicable to dental surgery are discussed, the chapter on endotracheal anaesthesia being a particularly good one. Difficulties and emergencies are dealt with in a more practical manner than is often the case. The chapter on general analgesia is long overdue in a textbook published in this country. The conservative attitude of the medical profession to this subject is illustrated by a recent correspondent to a leading medical journal who denied that such a condition existed.

Some of the views expressed in this book would not be endorsed by the majority of anaesthetists. An example of this occurs in the chapter on "status lymphaticus," in which the work of such authorities as Sir Bernard Spilsbury in this country and E. H. Campbell and W. N. Kemp in America seems to have been disregarded. As a whole, however, the theoretical parts are sound, sane, and well balanced. A minor criticism of a style which is usually meticulously accurate is the use of the term "local anaesthesia" for "local analgesia." American influence is apparent throughout, but it is not carried to excess, and the real advances which have been made in the New World have been judiciously used. The printing is excellent and the illustrations deserve special praise. Most of them are original and many are in colour, a method that is particularly effective in dealing with such subjects as cyanosis and tissue oxidation.

This book should prove most useful to students for supplementing routine lectures on the principles of anaesthesia, and also to all who wish to perfect themselves in the techniques of dental anaesthesia.

SPECIALTIES IN MEDICAL PRACTICE

Specialties in Medical Practice. Edited by Edgar van Nuys Allen, M.D. With a foreword by Donald C. Balfour, M.D., F.A.C.S., F.R.C.S., F.R.A.C.S. Volumes I and II. (Pp. 934; 300 illustrations.) New York and Edinburgh: Thomas Nelson and Sons.

These two volumes on the specialties in medical practice, which are issued as a supplement to the Nelson series of loose-leaf publications on systematic medicine, will appeal to the medical man who wishes to supplement his courses of postgraduate study or to bring his knowledge up to date; the specialist may find the matter too superficially treated. They will also be welcomed by the general practitioner, for nearly one-half of the contents are

devoted to simple conditions of the eye, ear, nose, and throat, their diagnosis and treatment; to fairly detailed instructions on the management of pregnancy, antepartum, labour, and the puerperium; to the diagnosis and operative or other treatment of gynaecological conditions; and to the examination of urological and proctological cases.

But they will appeal especially to the practitioner who cannot easily call in the help of, or refer his patients for treatment to, specialists. For example, the treatment of haemorrhoids is described in detail from simple cleansing and supporting measures to the technique of injections and of amputation and plastic operations. In a chapter of about 100 pages Dr. W. O. Thompson covers all the essential knowledge of endocrinology. Most of the syndromes associated with affections of the various glands of internal secretion are dealt with adequately, and though the dietetic management of obesity and diabetes mellitus can only be sketched in, it is remarkable how much useful information the contributor has brought together. There is a good summary by Dr. D. L. Wilbur of available knowledge of vitamins and vitamin deficiency diseases, while the discussion of the phenomena of allergy by Dr. Frank A. Simon is of practical value to those who are called upon almost daily to treat bronchial asthma, urticaria, hay fever, and allergic forms of eczema. A short and practical note on management of common joint and bone lesions is contributed by Dr. Don King. The review of neurology by Dr. Henry R. Viets is well written and useful for reference, and includes a helpful discussion of methods of treatment. The section on extrapyramidal lesions is especially good.

There is some disproportion in the space devoted to certain diseases. For example, the article on disseminated sclerosis is very short, not much more than half a page, while that on rabies is more than twice as long. Tabes dorsalis is not considered except in differentiation from peripheral neuritis, while general paresis is dealt with in the section on psychiatry. In different countries the incidence and importance of diseases vary, and this work is written for practice in the United States. The loose-leaf system allows new sections to be added or old ones to be replaced without interfering with the book as a whole. A further section on venereal diseases is projected.

BONE AND JOINT INJURIES

Fractures and Other Bone and Joint Injuries. By R. Watson-Jones, B.Sc., M.Ch.Orth., F.R.C.S. Second edition. (Pp. 724; illustrated. 50s., plus 1s. postage.) Edinburgh: E. and S. Livingstone. 1941.

That a second edition of this large and expensive volume should be required within one year is a high compliment to the author, and is amply merited. A fresh perusal confirms the very high opinion which we formed of its value when it first appeared, and it will certainly become an English classic on the treatment of fractures. The chief alteration in the second edition is the chapter on war wounds, which has been entirely rewritten, and as this includes a full discussion of the treatment of open and infected fractures and the closed plaster technique its value at the present time will be obvious. That it should be possible to obtain perfect functional results, in the grave injuries described and illustrated, by so simple a method as a closed plaster must be wellnigh incredible to a surgeon brought up in the elaborate antiseptic methods current in the last war. There can, however, be no question as to the soundness of the method, provided that it is properly carried out, and the excellence of the results obtained.

Notes on Books

Few users of microscopes know all that they should about them, from the medical student who often does not even understand how to keep them in order to the microbiologist who perhaps uses apochromatic objectives without really understanding their construction. These deficiencies in knowledge, whether of elementary technique or of the science of optics as applied to microscopy, can be made good by reading *The Microscope*, by R. M. ALLEN (Chapman and Hall, 15s.), a work which is technical enough to be useful and yet simple enough to be intelligible. The main chapters on the structure and use of the microscope are preceded by a short account of its historical development, and followed by a long chapter on the preparation of material for microscopical examination, the methods described including those employed not only in histology and microbiology but in entomology, petrography, and metallurgy. Each of these and the subject of photomicrography are too briefly dealt with for the account of them to serve alone as a practical guide. There is little to criticize in the main part of the book, but room might be found for an account of the construction of the modern binocular tube, for instructions on how to find out whether a condenser is out of centre, and perhaps for a "fault-finding table" as supplied for motor cars. The illustrations mostly depict instruments of American or German manufacture, and the author deplores the failure of English makers to introduce their products in the U.S.A., since "some of their designs are very appealing to discriminating microscopists." We on our side of the Atlantic may well hope that British firms will make the best possible use of present opportunities.

A Guide to Human Parasitology for Medical Practitioners, by Prof. D. B. BLACKLOCK and Dr. T. SOUTHWELL, appeared originally in 1931 and has already reached a fourth edition (H. K. Lewis and Co., 12s. 6d.). Parasitology in the sense in which the word is used by the present authors includes the spirochaetes (but not the bacteria), also protozoa, platyhelminths (tapeworms and flukes), and nematodes. There is also a short section on myiasis, and this is perhaps the least satisfactory part of the book. The work also contains much general matter, such as an introduction to the use of the microscope, notes on the study of material, etc., and also much tabulated fact on the geographical distribution of worms parasitic in man, or those that are spread by water, by meat, and by various other channels. The reader may perhaps feel that the book is rather disjointed and that it is a series of condensed notes rather than a continuous whole, but it is admirably clear and brief and well illustrated, though one could wish that the magnification of the figures were more frequently given. The book is widely used not only by those who require a formal knowledge of tropical medicine and public health but by many practitioners and laboratory workers in all warm parts of the world.

The design of the little book *A Course in Practical Biochemistry for Students of Medicine*, by A. T. CAMERON and FRANK D. WHITE, is such that it offers greatest value when used in conjunction with the senior author's well-known and popular *Textbook of Biochemistry*, but the rapidity with which new editions have been called for tells of its own success. Some of this is due to the fact that it does not fall into an error commonly made by authors—that of loading elementary students with an embarrassing amount of detail. This volume (fourth edition, J. and A. Churchill, 9s. 6d.) aims at simplification, and excludes all but the essentials. Occasionally the process is overdone, with the result that instructions in some places seem a little bare. The authors rely mainly on well-tried and long-established methods, though where recent work has provided clearly improved forms of test they have not hesitated to adopt them. Thus, for example, in regard to carbohydrates we find the diphenylamine test for fructose, the Sumner-Bial reaction for pentose, and the diazo-uracil test for sucrose—all of fairly recent origin. For so important a practical exercise the blood urea determination receives less space than it deserves, and, moreover, as the method stands it falls technically below the best that could be recommended for teaching to students.

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LICE AND DISEASE

Both varieties of the human louse, *Pediculus humanus*, were found in England before this war, but whereas the body louse, *Pediculus humanus corporis*, was seen comparatively rarely, the head louse, *Pediculus humanus capitis*, was much more common. The body louse was usually considered to be restricted almost entirely to vagrants, and although occasionally as much as 5% of a draft of Army recruits has shown signs of infestation, among the general mass of recruits and hospital patients well under 1% have had any body vermin. The head louse, on the other hand, was always exceedingly common. In a recent extensive survey on behalf of the Board of Education and the Ministry of Health Mr. Kenneth Mellanby[1] has shown that in our industrial cities nearly 50% of the girls and 30% of the boys—at least in the poorer sections of the community—had verminous heads during the year immediately before war was declared. The majority of these children had some live lice in their hair and not merely a few nits. In rural districts the situation was much more satisfactory, and it was rare to find more than 5% of any group of country children with head lice, although there is evidence that thirty years ago rural children were as frequently verminous as urban children are to-day. The crab louse, *Phthirius pubis* (often called *Pediculus pubis*), is in peacetime probably about as common as the body louse. Infestation is usually, but by no means always, venereal, and so crab lice may be expected to increase somewhat in wartime. There is probably much less danger of a general infestation throughout the population with *Phthirius* as compared with *Pediculus*, but the possible importance of the crab louse should not be entirely overlooked. The small peacetime reservoir of body lice and the widespread population of head lice might, under conditions favourable to the insects, give rise to practically universal infestation. Unless effective precautions are taken during the war, when so many people are living in shelters and are often unable to change their clothes, and when washing and laundry facilities are among those most easily disorganized, conditions may arise which will be ideal for the louse to increase and multiply.

The life history of both varieties of *Pediculus humanus* is similar: the female lays up to ten eggs a day; these may hatch within ten days, and after a further period of ten days the adults appear. If lice or their eggs are kept away from the body during part of the day their metabolism is reduced and the period of the life history greatly prolonged. At no stage can a louse live more than a month away from man, who is the insect's only source of food. Prof. Buxton[2 3] has shown that if breeding is not checked a single female might produce 120 daughters and 14,400 granddaughters, and within a short time a small louse population may increase to alarming proportions. The body louse is normally kept in check, except among the few vagrants who are chronically infested, by such simple measures as removing the day clothes at night (this alone will halve the rate of breeding) and by changing underwear, which removes the bulk of both eggs and other stages of the insect. If these things are done regularly, even in the face of frequent reinfestation, the parasites are unlikely to establish themselves on a new host. With the head louse most infestations are fairly light, and the ordinary combing of the hair, though ineffective in exterminating the parasite, serves to keep the population down to fairly small numbers; but if this combing were neglected, even for only a few days, these lightly infested heads would soon bear enormous populations and spread the infestation rapidly elsewhere.

If lice increased greatly their presence and the irritation of their bites would cause a great deal of discomfort, and it is probable that the inability to keep free from parasites might have a dangerous effect on the morale of large sections of the population. The possibility, however, of the appearance of louse-borne disease is of even greater importance. Typhus was formerly not uncommon in England, and if it were reintroduced at a time when lice were common (and transmission by both head and body lice is possible) a disastrous epidemic might occur. It is true that during the last war typhus never established itself on the Western Front, and some workers consider that for this reason it is unlikely to reappear in England, but the risk is one that cannot be ignored. With troops returning from areas where typhus is endemic, the introduction of the disease into England might be difficult to prevent. It must also be remembered that typhus is one of the few diseases that could be introduced by enemy action, for infected lice or infected louse faeces could be spread over our cities from aeroplanes, and the insects would easily survive even if dropped from very great heights. Relapsing fever, transmitted by lice, is also endemic in Eastern Europe, and this disease might similarly be introduced into England. As trench fever disappeared almost immediately after the last war its causation is imperfectly understood, but it is certainly transmitted by lice, and if the insects became common it might well reappear, this time among the civilian population.

If peacetime standards of cleanliness and hygiene can be maintained, then the louse menace will be avoided. It will be necessary to provide abundant facilities for hot baths and obtaining clean underwear for those whose homes have been damaged or where the public utility services have been put out of action. All cities should have ample supplementary disinfestation premises available in case of air-raid damage to the usual centre or in case there is a sudden increase in the number of parasites, for it is the disinfestation centre that should deal with the very verminous individuals who form the reservoir of body lice. Any measures taken at once to prevent an increase in infestation will be much more effective than those which will become necessary if we wait until the louse population has got out of hand. As well as the simple hygienic measures suggested above, recent research has

[1] *Med. Off.* 1941, 65, 39.
[2] *The Louse.* By P. A. Buxton. London, Arnold, 1939.
[3] *British Medical Journal*, 1940, 2, 603.

shown that certain insecticidal powders whose formulae are not yet published may be effective in checking infestation for many days after a single application of the powder to the underclothing.[3] If this work could be put into practice a great advance would be made, and an added protection would be available to those temporarily unable to live under civilized hygienic conditions. But our ideal must always be that such measures, useful as an added protection, should never be considered as the main defence against lousiness.

With regard to the head louse, although this parasite is most common in children, adults are by no means immune, for Mr. Mellanby finds[1] that even in pre-war conditions as much as 10% of adult women may be infested, sometimes very heavily. Even under war conditions these women could keep their heads free from vermin by thorough combing, particularly if this were done by using a specially made fine steel comb; suitable publicity on these lines should prove effective in preventing much increase. Use can also be made of the various liquids available which will easily kill all head lice and their nits; 70% alcohol (made from methylated or rectified spirit and applied so that the hair is kept wet for about an hour) appears quite efficacious and is perhaps the simplest.[2,3] It seems not unlikely that the war will greatly reduce the incidence of head lice among children who are evacuated to rural areas. Here they will learn to conform to a new standard of cleanliness by living among people who have come to know that the head louse may be easily dealt with by themselves in the home and who do not therefore feel dependent on a highly organized service provided by the State to deal (as it happens, not very effectively) with such problems. It must be realized that, in the case of both head and body lice, if the people likely to be infested can be made to co-operate in combating possible infestation, then the problem will be far on its way towards solution.

If total extermination is impracticable, it is obviously important that the louse should be kept in check in order to prevent a widespread degree of discomfort, which may be a danger to morale, and to avoid the possibility of louse-borne disease. So far as the body louse is concerned this can be attained by the maintenance of peacetime standards of hygiene. The war may even be made the opportunity for improving the situation by making the nation conscious of the deplorable hygienic standards which allow the degree of infestation by the head louse found even in peacetime.

CARCINOGENS IN THE LIVER

Are cancer-producing substances commonly present in the body under ordinary conditions? This is now one of the problems of Medicine. A few substances of proved carcinogenic power—tar and certain lubricating oils, for example—are met with in industry, but these account for only a small proportion of the cancers which appear in man. How are the great majority caused?—by naturally occurring carcinogens, hormonal or other? Chemists have produced large numbers of new carcinogens for research purposes, but of these not one is known to occur in the body under ordinary conditions. At first methylcholanthrene aroused special interest, for here at last was a carcinogen which might conceivably be formed in the body by simple chemical transformation of deoxycholic acid, a normal constituent of bile. As yet, however, there is no evidence that such *intra vitam* transformation does in fact take place. Some few common substances—as, for example, sugar in rats and lard in fowls and mice—may on rare occasions give rise to tumours at the site of inoculation, but of all the potent carcinogens hitherto found only the ovarian hormone is ordinarily present in the body. Painted on the skin of mice or injected subcutaneously, oestrone readily produces mammary tumours, the actual incidence depending on the strain of mouse. There is evidence, too, that ovarian hormones do, sometimes at least, play a part in the causation of naturally occurring mammary carcinomas in women.

Are there still unknown carcinogens to be discovered in the body? For the past five years Prof. Shabad of Leningrad has been working on this problem. In earlier papers he claimed that bile from cancerous human subjects contains a carcinogen which is demonstrable by experimental means. Now Kleinenberg, Neufach, and Shabad[4] report that tumours can be induced in mice by repeated injections of benzene extracts of human liver. Extracts from non-cancerous subjects are definitely active, and extracts from cancerous subjects show considerably greater activity. The resulting tumours in mice are of many different kinds, and include benign and malignant tumours of connective tissue, mammary glands, skin, sebaceous glands, maxillae, stomach, and liver. The type of the tumour which affected the human subject from whom the liver was taken had no effect on the type of tumour produced in mice. Moreover, most of the mouse tumours appeared in parts of the body remote from the site of inoculation.

If we accept the findings of Shabad at their face value we must conclude that pervading the human system there is something which when present in excess becomes manifest in a liability to neoplastic disease, and we must conclude, too, that this liability is to all kinds of neoplastic disease and not simply to one histological type alone. The results obtained in the principal experiment appear to be significant, though the number of reacting animals is small; for if we consider only mice surviving eight months or more, which seems fair, and exclude all benign tumours, which seems a little hard, we find 2.3% malignant tumours (all kinds) in the controls, 5.5% in mice receiving extracts from livers of non-cancerous subjects, and 22.2% in mice receiving extracts from livers of cancerous subjects, the actual figures being 9, 3, and 24 cancerous mice respectively. The effective substance seems unlikely to have been produced during the extractions, as excessive heating was always avoided. In any case the extracts of livers from non-cancerous subjects formed valid controls. And yet on general grounds one hesitates to accept the evidence. If a carcinogen of entirely general properties were really present in the body to the extent and with the frequency suggested by the experiments, and if it were really responsible for the majority of human cancers, then it might perhaps be expected that multiple primary

[4] *Amer. J. Cancer*, 1940, 39, 463.

tumours, or even completely generalized primary conditions, would be more prevalent in man, and also in Shabad's mice, than observation shows. It would seem that no entirely general influence can offer a complete explanation of established facts. Surely more specialized causes must determine the differences in geographical distribution observed among the various kinds of cancer which afflict mankind—must determine, for example, why throughout a large part of Wales the incidence of cancer of the stomach is over 40% higher than the average for England and Wales taken as a whole, while in the same region cancer of the vagina is some 30% lower than the average.[2] Surely highly specialized factors must be invoked to explain why one person gets this kind of cancer and another that. Nevertheless—and the situation is a curious one—we accept oestrone as a genuine cause, although it affects mammary glands from distant sites of injection and although we cannot say in any given case why the primary malignant focus arose just where it did rather than at some other point.

Another search for carcinogenic substances naturally present in the human liver is reported in two papers which are somewhat closely associated. One is by Des Ligneris[3] of Johannesburg and the other is by Hieger[4] of the Royal Cancer Hospital. The work derives from the fact, supported by a number of authorities, that throughout both Asia and Africa primary cancer of the liver is rare among Europeans, whereas among Malays in the Dutch East Indies and Bantus in South Africa primary cancer of the liver is common, especially in males. The cause of this difference in incidence is not known. Some think it may not be so much a question of race as of racial habits. It is said that the livers of practically all Bantus, even the supposedly normal, show cellular changes highly suggestive of assault by some toxin. Des Ligneris made extracts of both European and Bantu livers, omitting cancerous areas. He treated with alcoholic potash and then extracted with petroleum ether, a method suggested by Hieger. He painted mice and obtained a number of skin papillomata and epitheliomata with extracts prepared from both cancerous and non-cancerous Bantu livers, but no tumours with extracts prepared from non-cancerous Europeans. Hieger[4] used extracts of livers obtained from Bantus and from Europeans. Twelve tumours have appeared so far in 367 mice receiving repeated injections, but the figures are somewhat misleading when thus summarized. Extracts differed very greatly in potency. In one experiment tumours appeared in seven out of ten mice receiving extracts of livers from cancerous Europeans. The amount of extract obtained from a single liver is always small, so that even a very few mice can receive repeated doses only when several extracts are available. This explains the difficulty in tracking down the source of variations. It was thought that livers from cases of lymphosarcoma have given the most potent extracts.

It is difficult at present to trace the interrelationships between the findings of the workers in these several laboratories. All have investigated liver, but there have been differences in the source of the liver, in the methods of extraction, and in the methods of test. Hieger's results agree with those of Shabad in that tumours were indeed obtained in mice by injections of liver extract, but differ materially from his in that the tumours were all alike in type (sarcoma) and in that all appeared at the site of injection. Continued experiment should solve such perplexities.

[2] P. Stocks. Annual Reports of the British Empire Cancer Campaign for 1936, 1937, 1939.
[3] *Amer. J. Cancer*, 1940, 38, 489
[4] *Ibid.*, 496.

HEALTH OF NEW YORK CITY

To statisticians and epidemiologists the value of health returns depends on their accuracy and the detail of their analysis. Time is needed to achieve these objects. But delay in the publication of vital statistics detracts from their interest as a measure of the recent progress of the public health. A statement of the incidence of infectious diseases in England and Wales in 1940 issued a few weeks ago by Sir Wilson Jameson was a gratifying break with tradition, but even in peacetime we have usually to wait some months after the end of a year before we receive somewhat sparse preliminary information as to birth and mortality rates. The Health Commissioner of New York (Dr. John L. Rice) has demonstrated that difficulties can be overcome. On January 1, 1941, he issued a preliminary report on the health statistics of the city for 1940, running to fourteen pages of foolscap and analysing in considerable detail the death rates by cause and the case rates of the common infectious diseases. When it is realized that New York, with a population of 7,392,000 persons, is nearly twice the size of the administrative county of London this promptitude is seen to be an achievement which should not be beyond the powers of our own larger cities. Provisional statistics issued at the close of a year either by local medical officers of health or by the Registrar-General would differ to such a small extent from the final figures that they need be in no respect misleading.

The New York statistics themselves are remarkable when it is remembered that the people of this city, like other large towns of the U.S.A., is of highly mixed origin and includes many negroes, Filippinos, and other coloured races with a high susceptibility to some of the most mortal diseases. The crude death rate was 10.3 per 1,000. Poliomyelitis continued to be infrequent, as it has been for the past five years, and, perhaps of more interest to us in the light of our recent experience, only forty-eight cases of cerebrospinal fever were notified. The deaths, numbering fifteen, suggest that reporting of cases may have been imperfect, if it can be assumed that chemotherapy is as efficacious in America as it is here. While the incidence of scarlet fever was heavy and measles rather high, the mortality from these diseases was unusually low, being 0.9 per 100,000 under 15 years of age for scarlatina and 0.7 per 100,000 under 5 years for measles. The prevalence of whooping-cough was a little below the average for the previous ten years, but it was much more fatal than measles, with a mortality rate of 10.8 per 100,000 under 5 years. A new low record for typhoid—0.2 per 100,000 at all ages—contrasts with a rate of 9.2 for appendicitis and illustrates the changing problems of preventive medicine. This is further reflected in the growing toll of the chronic diseases of

later life; with a uniform denominator of 100,000 the rate for diabetes has risen from 25.7 in 1930 to 42.0 in 1940, for cancer from 117.0 to 166.3, and for diseases of the heart, arteries, kidneys, and for apoplexy from 381.6 to 473.3. Dr. Rice points out that these increases are mainly due to the ageing of the population, although more frequent diagnosis is also a factor in the case of diabetes and cancer.

The most striking figures, however, are those for tuberculosis, diphtheria, infant mortality, and puerperal mortality. The death rate from all forms of tuberculosis has fallen from 73.3 per 100,000 in 1930 to 49.0, the respiratory tuberculosis rates being 64.2 and 44.9 in these years. The rates for New York in 1938 were 52.5 (all forms) and 47.7 (respiratory), as compared with 72.3 and 63.7 in the administrative county of London. The decline in diphtheria has been phenomenal. An intensive campaign for immunization began in 1929. The average annual number of cases notified in 1920–9 was 10,685 and the deaths 684. The subsequent decline has been rapid and practically continuous until in 1940 only 408 cases and ten deaths occurred, giving a mortality rate of 0.7 per 100,000 children under 15. This may be contrasted with the rate for England and Wales, similarly calculated, of 31.0 or more in recent years. Six health centre areas with an aggregate population of 1,400,000 have had no death from diphtheria for the past three years. While a substantial fall was already taking place in New York before immunization could have had much effect, it is certain that the continuity and the magnitude of the decline over a period of eleven years admit of no natural explanation. The infant mortality rate of 34.9 per 1,000 live births is the lowest so far attained. The steady fall in this rate is not associated with an exceptionally low birth rate, although it dropped from 20.8 per 1,000 of the population in 1920–9 to 13.7 in 1936 and gradually recovered to 14.5 in 1940. Some of the American States, such as Connecticut and Massachusetts, have equally low infant mortality rates, as have New Zealand and Australia, but the New York figure is likely to be a record for a large city. It is stated that over 60% of the infant deaths occurred in the first week of life, so that the number dying after the neo-natal period—that is, beyond 4 weeks of age—must be phenomenally low. A steep fall has also taken place in puerperal mortality from 6.4 per 1,000 live births in 1933 to 3.0 in 1940. The drop therefore began before sulphonamides were widely used in the treatment of puerperal infections, but it has been steadier since 1935 and resembles our own rate in this respect. The causes of puerperal mortality are not given, but they may be found to follow the same course as Dublin has revealed for the whole Federal Union[1]—namely, a more rapid decline of non-septic causes up to 1935, followed by acceleration of the fall of sepsis from that year onward. When it is remembered that obstetric practice in New York differs from ours in that a far higher proportion of confinements takes place in hospitals and domiciliary midwives are engaged for comparatively few cases, the contemporaneous improvement in maternal mortality casts doubt on some of the theories which have moulded opinion in this country.

[1] Dublin, L. I. (1939). The Problem of Maternity—A Survey and Forecast. *Amer. J. publ. Hlth.*, 29, 1205.

TRICHINIASIS IN ENGLAND NOW

An outbreak of trichiniasis in this country, and the delay in recognizing it, make it advisable to remind medical men of some of its outstanding features. No disease is more likely than trichiniasis to pass unrecognized, because its symptoms, except in the severest cases, are commonplace in the last degree and easily explicable in a dozen other and apparently more probable ways. Its clinical manifestations are protean. The first effect of eating pork containing living cysts of *Trichinela spiralis* is upper abdominal pain with vomiting and diarrhoea; the latter often persisting, although its severity and duration are very variable, until the stage of invasion of the bowel mucosa by the mature female worms. Each of these produces a thousand or more embryos, which enter the blood stream and come to rest in the voluntary muscles. A second stage then begins, on about the ninth day after consumption of the infested meat, which is characterized by generalized muscular pain and tenderness and by fever. An apparently banal gastro-enteritis is thus succeeded by an equally commonplace attack of "rheumatism." This stage may be of any degree of severity, according to the number of parasites present. Lightly infested cases are almost certain to be disregarded, unless during a recognized epidemic. There may be nothing else than puffiness of the eyelids, and renal disease may be suspected, the absence of albuminuria dissolving the suspicion. The more severe compel attention by the height of the fever, the severity and wide distribution of muscular pain accompanied by swelling and marked induration, and sometimes by oedema, which affects the face, especially the eyelids, at an early stage, and sometimes much later the limbs and even the trunk. The condition of the muscles interferes not only with limb movements but with mastication and respiration; embarrassment of respiratory movements owing to involvement of the diaphragm and intercostals may lead to pneumonia. These severe cases, which also exhibit rapid wasting, are exceptional; in the majority the attack passes for one of rheumatism or influenza, although its duration—about five weeks—will eventually cast some doubts on the latter diagnosis. Other conditions provisionally diagnosed in the present outbreak are cerebrospinal meningitis, melancholia, paralysis, pyelitis. But the common syndrome is puffiness of the eyes and face, a raised temperature for two to three days, followed by eosinophilia. Whenever trichiniasis is suspected the first investigation should be a differential leucocyte count. Eosinophilia in this disease is extreme, 20 to 60% of these cells in a raised total leucocyte count being common. Medical men are urged to make use of the public health laboratories. Certain confirmation is obtainable only by finding adult worms in the stools, or by finding embryos, either in the blood by digesting a considerable volume and examining the deposit—a proceeding which is applicable during the stage of invasion—or later in muscle. This last method is easier and more certain, and is usually carried out by a vertical incision over the lower part of the deltoid and the excision of a small portion of this muscle. Embryos are identifiable with the low power of the microscope in teased-out or "press" preparations, either free if infestation is very recent or in process of encystment. Purging, especially with large and repeated doses of calomel, is of value in the early stages; no treatment is known which has the slightest effect on embryos already in the tissues. In the presence of an epidemic of trichiniasis any patient complaining of gastro-intestinal disturbance after eating pork in any form should at once be purged; the majority of the parasites can be got rid of by treatment instituted before they mature. For prevention it is necessary to ensure that all pork and sausages are thoroughly cooked. Trichiniasis is notifiable.

FOOD IN THE SHELTERS

We publish elsewhere in this issue a survey of the canteen services in London shelters. The basis of good health, as has so often been said before, is good food, and there can be no doubt that in peacetime the people who now inhabit the shelters were not eating the right kind of food for healthy development of mind and body. This was partly the result of economic circumstances, and partly the result of ignorance. The fact that large numbers of people now live in shelters and eat in them provides an excellent opportunity for studying the dietetic habits of the poorer sections of the population, and it soon becomes evident that they prefer the kind of food experts in nutrition frown upon, and do not take readily to more suitable kinds of foods that are put before them by the numerous agencies conducting the canteen services. For example, tea and cakes are demanded in place of other more nutritious dishes. There is, too, a superstitious reverence for certain meat extracts, a superstition based upon the compelling influence of modern advertising. There is no doubt that uneducated people—and even educated—are inclined to take literally the slogans that stare down at them from attractive posters on hoardings and other places.

It is perhaps too easy to attribute all bad dietetic habits to ignorance, because the products of refined flour and refined sugar are cheap and filling, and the choice of these cannot be said to lie in any innate preference. The shelter problem, however, does give all those concerned in this matter a further opportunity for educating a large section of the population, from the point of view not only of improving their health now but also of teaching them to demand a more satisfactory diet when peace returns. The Ministry of Food is setting a magnificent example in its attractive advertisements in the lay press. Further education of the poorer section of the population may be undertaken through the medium of leaflets, films, and lectures, and this will have to be persistent in order to overcome the settled customs and prejudices of those most in need of assistance.

The Ministry of Food is now undertaking to prepare on a large scale a canned vegetable soup to be sold in shelters and to be distributed in an emergency at a very low cost. The basis of the soup is milk, oatmeal, and potato, and such other vegetables as carrots, beans, cabbage are included. One portion of this soup with a piece of brown bread will provide approximately 500 calories, and will make a very substantial contribution to the day's requirements for calcium, iron, and vitamins A, B_1, and C; the soup has been made up with this end in view. It is to be hoped that when peace comes caterers with a sense of social responsibility will follow this example and market as nutritious a vegetable soup at an economical price, and in its preparation take the kind of expert advice which is now at the disposal of the Ministry. As is clear from our survey, there are a number of bodies engaged in the canteen services—for example, the Friends' Ambulance Unit, the Women's Voluntary Services, the Salvation Army, the London Passenger Transport Board, the Milk Bars Association—and in some instances local caterers. No one has anything but praise for the good work that all these bodies are doing, and for the high-minded motives behind it. But here again there is a divergence of food customs depending upon the knowledge and interest in dietetic matters. At the risk of appearing invidious we would single out the extremely thoughtful work that is being done by the Friends' Ambulance Unit. Behind the work they do there is evidence of intelligent application of modern knowledge on nutrition, and sympathetic attempts to educate the shelter population. Such an observation leads to the conclusion that the people who run canteen services, and caterers themselves, also could do with some elementary instruction in the same subject. The fundamentals of nutrition are simple. There is nothing recondite about them, and popular writings during the past few years have brought them before a wide public. As a profession we can individually and collectively continue to force these matters on all sorts and conditions of people But one group in the profession—the medical officers of health—are perhaps in the best position to bring their influence to bear in the health areas they serve.

DIABETICS IN WARTIME

The diabetic shares the common experience of disorganization of life and privation in wartime, but some of the prevailing conditions involve him in special dangers. These were discussed at the last meeting of the Medical Society of London in a short paper by Dr. Wilfrid Oakley. The effect of longer hours of work, he said, could be guarded against in the case of the diabetic by readjustment of meals and the carrying of extra carbohydrate rations, biscuits and chocolate, if obtainable, being the most convenient. As for long hours in shelters, he said that he had noticed among out-patients at King's College Hospital in the early days of air raids that the morning specimens contained large amounts of sugar, suggesting a tendency towards indulgence in food, but as the patient became used to his new mode of living the sugar content began to fall back again to its usual level. The danger to the diabetic if he becomes an air-raid casualty is that he may be admitted to hospital in an unconscious state without anyone knowing that he is a diabetic, and go on to a state of coma which may be attributed to the effect of his injuries. The Diabetic Association first circulated cards which diabetics might carry on their persons, but these have now given place to a metal disk to be worn on the neck or the wrist. A wartime possibility is a temporary breakdown in supplies of food or of insulin, and this can only be guarded against by iron rations (a sealed tin of biscuits of known carbohydrate value and a month's supply of insulin). Dr. Oakley pointed out that the chief dangers to the diabetic in wartime were hypoglycaemia and ketosis. Hypoglycaemia due to the use of zinc-protamine-insulin was not greatly to be feared if only small doses, say 20 units, were given, with regular carbohydrate feeds every three or four hours and a bedtime feed of 10 to 20 grammes: but when the dose exceeded 20 units hypoglycaemia was likely to occur, and with doses of between 30 and 40 units was a real danger. Nearly all the tragedies with zinc-protamine-insulin had been the result of giving rather heroic single doses instead of smaller doses of a combination of zinc and soluble insulin. The danger of hypoglycaemia was greater and the hypoglycaemia itself might be more severe in patients who were treated with protamine insulin, and some people had urged that protamine insulin be not used during wartime; but the advantage of a method of treatment requiring only one injection over a method which necessitated at least two, more than compensated for possible dangers. It was far easier to take carbohydrate in a portable form to the shelters or workshops than to give an injection of insulin under the same conditions. Again, the form of treatment with which the patient was already familiar was always to be preferred. At the same time, Dr. Oakley did not think that protamine insulin should be given to new out-patients without a reasonable period of stabilization in hospital or nursing home. He gave the figures of the deaths of diabetics who had been attending King's College Hospital. During the war period from September, 1939, to the end of 1940 the deaths numbered 67. For the four years 1935–8 the annual numbers of deaths were 65, 62, 63, and 84 respec-

tively, so that there had been a fall during the war period. In not one instance was the death of a patient due to hypoglycaemia as a result of using protamine insulin in wartime. Dr. Oakley added that it was most desirable that the diabetic taking protamine insulin and regularly using the same shelter should inform some responsible person, such as the shelter marshal, that he was a diabetic. Secretiveness about being a diabetic is pardonable in peacetime, but is apt to be dangerous in war.

CONTROL OF INFECTION IN SCHOOLS

While the general principles underlying the prevention of the spread of infection were settled before the bacteriological era, advancing knowledge has led to specific methods for the control of each infectious disease, or group of diseases, which are not applicable to others. The recognition of this specificity leads to economy of practical effort. The Memorandum on Closure of and Exclusion from School issued jointly by the Ministry of Health and the Board of Education, which first appeared in 1909 and was last revised in 1927, recognized the point, but new discovery and the practical experience of medical officers of health and school medical officers have led to representations during the past year that this publication should be overhauled. So far there is no indication that this is being done. The reason is obvious, but the Medical Officers of Schools Association, which is concerned with preparatory and public schools, has not been deterred by present circumstances. Their Code of Rules was first issued in 1885, has undergone revision and enlargement on several subsequent occasions, and now appears in new form.[1] It deals briefly with certain general matters, such as hygiene in schools, the infirmary, sanatorium or sick house, examination of entrants, general precautions against infectious disease and measures to be taken on its occurrence, and then summarizes, in alphabetical order, the salient points on each common infection. Since the Revision Committee of the Association contained specialists in infectious diseases as well as school medical officers its deliberations have resulted in a code which embodies modern knowledge and is also thoroughly practical. It will be useful not only to those for whom it is primarily intended but also to health departments which are concerned with similar problems both in rate-aided schools and in the many other institutions for which they are responsible. Reference may be made to one or two issues of general interest. On the question of dispersion of pupils, which aroused much controversy some years ago when poliomyelitis invaded certain public schools, the code is cautious, but on the whole is against the break-up of schools except in very unusual circumstances. It recommends segregation of meningococcal carriers, a procedure which, although not now generally favoured, is probably advisable for closed susceptible communities of the kind in question. It records, without approval or disapproval, the view of some public school medical officers that contacts of non-notifiable infections should not be excluded but observed in school. While the diversity of the manifestations of streptococcal infection is adequately discussed, more attention might have been paid to the growing body of evidence that streptococci and other micro-organisms may be spread not only by droplets, fomites, and the persons of attendants, but also for quite long distances through the air in droplet nuclei. As minor criticisms, it may be pointed out that the list of diseases requiring to be notified is out of date, confused, and repetitive; that Salmonella infection of animals subsequently slaughtered for human food is ignored as a cause of food poisoning (and it appears to be assumed that the existence of true human carriers is established); and that the impression is conveyed that accredited milk is safer than ordinary commercial milk. On comparing the incubation periods given for the various infectious diseases with those stated in the official memorandum and other publications, one cannot avoid being struck by the marked discrepancies in some instances. After so many years of clinical and epidemiological observation some finality should have been reached, and yet there is no list, including that given in the code, which is correct in every particular. The common range of the period and its extreme limits, if they are known, should be given for each disease. If there is any doubt, this should be recorded.

[1] A Code of Rules for the Prevention of Communicable Diseases in Schools. (Pp. 71. 1940.) London: J. and A. Churchill Ltd. (3s., postage 3d.)

THE PROBLEM OF CHRONIC RHEUMATISM

In a recent communication on the subject of focal infection in rheumatic diseases Reimann and Havens[1] cast doubts on the aetiological importance of infected teeth and tonsils. The evidence they marshal is impressive, but they admit that at present no final conclusion can be reached. It is generally conceded that both tonsillectomy and extraction of teeth have been carried out in the past to a much greater extent than appears justifiable in the light of our present knowledge. It is obvious, however, that an infected tonsil or tooth socket which is discharging pus into the mouth must have a harmful effect on the mucous membranes of the alimentary tract, especially if there is achlorhydria, in which case radical treatment is necessary. Osgood, who discussed the medical and social problems of chronic rheumatism in his Nathan Lewis Hatfield Lecture of the College of Physicians, Philadelphia,[2] believes that gastro-intestinal disorders are probably of aetiological importance, particularly in association with faulty alimentation; he quotes Holbrook, who, in a wide experience, found that a majority of his patients with rheumatoid arthritis gave a history of gastro-intestinal dysfunction. Too much importance has been attached to areas of rarefaction round the roots of the teeth. They are commonly assumed to represent periapical abscesses, but this is by no means always the case, and Sharp and others have shown that with proper treatment there may in time be restoration of the bone to its normal density. Cecil, who formerly held that removal of such infective foci was essential in the treatment of rheumatoid arthritis, has recently stated in an article written in collaboration with Angevine that "in no instance was the course of the disease altered or the patient cured when supposed foci were removed." Reimann and Havens suggest that the lowered resistance which is commonly a forerunner of rheumatoid arthritis may lead to infection of the teeth, tonsils, or other organs, and that these foci, as well as the arthritis, may be due to some common cause—a new point of view which deserves serious consideration. In the light of the evidence advanced by these authors and others it is clear that the problem of focal infection calls for re-examination. Osgood believes that the unknown factor in causation will probably prove to be biochemical rather than bacterial. He urges that there should be financial help from public funds for the fight against rheumatism, and that the expenditure could be justified on grounds of economy alone.

[1] *J. Amer. med. Ass.*, 1940, **114**, 1.
[2] *Amer. J. med. Sci.*, 1940, **200**, 429.

The Hunterian Oration, entitled "Charles White of Manchester and the Development of Provincial Medical Education," will be delivered before the Royal College of Surgeons of England at the Royal Society of Medicine, 1, Wimpole Street, W., on Thursday, February 13, at 2.30 p.m., by Prof. A. H. Burgess.

FEEDING OF THE SHELTER POPULATION

A LONDON SURVEY

The supply of nourishing food to the immense population which nightly congregates in the London shelters is an important phase of the air-raid problem which confronts the authorities. The work has been undertaken by voluntary bodies as well as professional caterers, and below we give some account of these services.

In the Tube shelters from 80,000 to 120,000 people are catered for every night. On all stations used as shelters there are facilities for making tea and cocoa and also soup. Tea is served at night and in the early morning, and cocoa and soup on alternate evenings. It has been found that the preference of the shelterers is for a cup of tea with such food as meat pies or sausage rolls early in the evening, and cocoa or soup before they go to sleep. When the service began tea and cakes were all that could be provided, but a greater variety can now be offered, and the consumption of more nutritious foods is gradually increasing. Milk is supplied to child and adult shelterers if the nurse at the first-aid post certifies it as desirable and necessary.

The London Passenger Transport Board acts as the agent of the Ministry of Food for this service, which is undertaken by a special staff. Five trains are used to transport the food to the stations from depots in London and the suburbs. It is only on Tube stations that, to avoid congestion on the platforms, the food is taken round to the shelterers, the liquids being carried in two-gallon cans and the food in baskets. Elsewhere the food is usually served from a counter.

The Salvation Army is responsible for the feeding in a very large number of London shelters, and has a similar organization in large provincial cities. The work in London was started, at the request of the police, a few hours after the beginning of the intense air-raiding. It was undertaken to meet the immediate need—the Salvation Army is not advised by dietitians—but it has now been brought within the Ministry of Food scheme. In some places the local authorities supply the equipment; in others the Army supplies its own. In large shelters an improvised fixed canteen is installed, while mobile canteens look after the small ones. The food supplied consists of sandwiches with various fillings, sausage rolls, meat pies, buns and cakes, with tea. It is as wholesome, and served as cleanly and palatably, as possible. As a general rule arrangements are made only for heating water; all cooked foodstuffs must be prepared beforehand.

One mobile canteen run by the Salvation Army visits seven shelters in the dockside area. It works under great difficulties. Its "kitchen" is a surface shelter streaming with water. Tea is made in insulated urns in the "kitchen," where sandwiches are also prepared. The van calls at the shelters and serves the people direct. There is reported to be a huge demand for tea and cakes among the very poor in this area, while sandwiches are a poor second. The shelters are also visited in the early morning with a similar bill of fare, but the sales are then small. The demand for tea and sweet cake in the morning is, however, quite remarkable. This may be understood in the case of those who have their own works canteen to fall back upon for more substantial food, but not in the case of others less well provided.

A Model Canteen

The work of the Women's Voluntary Services so far as shelters are concerned is concentrated principally in one London borough. This body has established a model canteen in one of the large West End shelters, where soup is served and the eating of brown bread is encouraged by distributing it free with the soup. The soup is made in the W.V.S. soup kitchen from bones and vegetables. The shelterers are encouraged to eat apples because they clean the teeth, and hot drinks are made with as much milk as possible. Meat pies, fish cakes, "hot dogs," and sweet cakes can also be obtained, and in the morning porridge, bacon and fried bread, and marmalade sandwiches are available. More than forty mobile canteens run by the W.V.S. are serving surface and trench shelters. Tea and coffee are sent out in thermos urns, soup is distributed cold and warmed up in the shelters, and sandwiches and the like are also provided. The W.V.S. works in touch with the Ministry of Food, and will be trying out its recipes in the model canteen. Its primary object is to give—and to educate the people to ask for—food of good nutritive value. The organization has the services of expert dietitians.

The Friends' Ambulance Unit is responsible for the feeding arrangements in twenty-one shelters in the East End and City, and has fixed canteens in the large shelters. All the buying is done at the Unit's headquarters, and the canteens are supplied at cost price. In the larger shelters served by the mobile canteens a tea urn is left with a box of food, for which some person in the shelter is responsible. The profits—that is, the difference between the cost to the shelter and the payments by purchasers—are used for the benefit of the shelter; the prices are fixed by the Unit. In the very small shelters the people are served by the van direct. The food includes sandwiches with various fillings, and a popular delicacy is a roll cut open and a sausage inserted (the sausages are grilled in the kitchen at headquarters and carried round in a tin placed in an improvised "haybox").

In the early mornings porridge with milk and sugar is served in the fixed canteens and also carried round to the shelterers, with tea, sandwiches, and cake. The morning demand varies greatly from shelter to shelter for no apparent reason. In one of two shelters in one street served with morning porridge the dish is eagerly accepted, while in the other the people "will not look at it." The Friends' Unit also has qualified dietitians on its staff.

A London borough which has only small shelters has given the catering over to a number of local people, whose job it is to feed the working-class population. The prices are fixed by the local authority, and are approximately 1½d. for liquid refreshment, 1d. and 2d. for cakes, and 2d. for sandwiches. Electric hot-points and boiling-points have been installed, together with a good cupboard for storage and an improvised counter. There is an evening and an early morning service according to the requirements of the people in a particular shelter. Soup is available in some of the shelters and has been asked for in others. No voluntary body is operating in this borough; the authority is satisfied that the people are getting what they want.

Twenty-eight shelters are catered for by milk-bar proprietors, who have found that the beverage preferred by the vast majority of the people is tea; the proportion of coffee, cocoa, and milk asked for is very small. For soup there is practically no demand. The wastage of food at first was considerable. A good variety was provided, but for a number of reasons it was not consumed, and the proprietors have had to cut the bill of fare to meet the demand, which is mostly for a hot drink and sweet cakes or biscuits. A morning service is given in these shelters, but the demand is small.

Individual Enterprises

At a shelter under one of the large London markets there is an excellent canteen which was presented by a City merchant and is staffed by voluntary workers. A very good vegetable soup is sold, the recipe for which was worked out by the Ministry of Food. Fish cakes and portions of fried fish cooked in an adjacent staff kitchen, wholemeal bread rolls and sandwiches, and cake are provided. Tea is available, but during our visit milk, soup, and cocoa seemed to be as much in demand as the cup which is supposed above all to cheer the shelterer.

At an East End settlement visited thirty gallons of soup were being made in large coppers as carefully as if in a hospital. This soup is carried round in insulated urns to a large number of shelters fairly late in the evening so

that the people can go to sleep on soup rather than on tea. If there is a raid the soup, with coffee and sandwiches, is available for A.R.P. workers and firemen. Sometimes a bland soup is made, at others the cook puts in flavourings. The vegetables are not mashed into a pulp, but left in small lumps, because the people "like something to bite into." It is sold at one penny a cup, with a piece of bread, and salt is available. "They won't look at it if they can't put salt into it."

A well-known Methodist minister in Westminster has long interested himself in the feeding in shelters in his neighbourhood, and, noticing the predominance of starchy foods consumed, he and his wife two months ago resolved to counteract it by making a vegetable soup in which bones had been boiled down. This is served early in the evening as the workers arrive, and on the average rather less than half the people take advantage of the soup, the charge for which, with a piece of bread, is twopence. If the nurse in these shelters notices anyone "off colour" a milk drink is provided free of charge. The food in these shelters is of the usual good quality associated with voluntary efforts.

In another district the "Woolton sandwich," the filling of which consists of grated raw vegetables bound with chutney, is popularized by posters in the shelters. South of the river local fish-and-chips friers in white coats with nicely-done-up packets follow their bombed-out clients into the shelters; rolls with hot bacon inserted are considered a delicacy elsewhere, and at another shelter faggots made from butcher's offal and herbs have pride of place in the menu. Alike in districts that could be described as poor and in others which would be considered well-to-do, potatoes baked in their jackets served hot with a dab of margarine and sprinkled with salt and pepper are very popular. In one shelter baked bread pudding made from a mixture of broken pieces of brown and white bread, flavoured with spice, a little sugar, and dried fruits, is considered a dainty dish, served either hot or cold.

General Conclusions

From our survey it is fairly obvious that there is a line of demarcation between the bodies which are advised by experts on food and which have foremost in mind the nutritional welfare of the people they are serving, and those which are bound by the necessity of paying for their equipment and labour and covering expenses. Where a voluntary agency is at work the increase in the variety of food and its higher nutritional value are marked; more care is also taken to keep the food wrapped and clean.

That there is a good deal of difficulty in this form of catering is also evident. Preparation has to be made for air-raid nights, whether air raids come or not, and the food has to be of such a nature that it can be re-issued the next night and will be appetizing. Many of the smaller shelters are tucked away in side streets difficult of access; kitchen accommodation is extremely limited, and there are other difficulties. The fact that practically every shelter in London is now provided for in one way or another speaks volumes for the ingenuity and patience of those responsible, to say nothing of the courage and driving skill of the workers in charge of mobile canteen vans on dark wintry nights and during air raids.

Fut Ang Chu and Jui' P'ing (*Chinese med. J.*, 1940, **58**, 39) state that of thirteen children in an orphanage inoculated with a vaccine prepared by Sauer's method before an outbreak of whooping-cough none developed the disease in spite of continuous and prolonged exposure, whereas twenty-three (67.6%) of thirty-four non-inoculated children whose age, mode of living, and degree of exposure were much the same as those of the inoculated children developed typical pertussis. The serum agglutination titre for *Haemophilus pertussis* was found to increase during the course of the epidemic in seven of the inoculated children, indicating that they had been exposed. The remaining six also showed increased agglutination titres, but they had been given an additional dose of vaccine during the early part of the epidemic.

SPECIAL ANTI-GAS RESPIRATORS

The Ministry of Home Security has just issued a circular to local authorities announcing that two new devices are now available for issue to persons who are unable to wear standard respirators.

Two Types of Mask

The first is a standard civilian respirator with the addition of an outlet valve. Breathing difficulties experienced in wearing a respirator by persons with respiratory troubles are in general due more to the expiratory resistance than to the inspiratory resistance, and the new respirator with outlet valve overcomes a great part of these difficulties. So far as resistance to breathing is concerned, this respirator compares favourably with any other type, and should be adequate to meet all but the more severe respiratory troubles.

The second is a helmet respirator which is designed for those who, because of tracheotomy, facial deformity, or severe cardiac trouble, etc., are unable to wear any respirator of ordinary type. The problem of protecting such persons against gas has naturally been under active investigation by Government research workers for a considerable time. It has also attracted some attention in the medical profession, and in particular descriptions have been published of various devices for adapting standard respirators so that they can be worn by persons who have undergone tracheotomy. These devices have mostly been of the type which involves the fitting of a gas-tight pad, with breathing tube, over the tracheotomy orifice. It is, therefore, of interest to note the lines on which this new helmet respirator has been designed in the Government research establishment responsible for its development.

The Problem in Cases of Tracheotomy

The investigation of the general problem of protecting persons who cannot wear standard respirators included a careful study of the tracheotomy type. From an examination of a number of typical cases it was apparent that only a small proportion could be fitted in a gas-tight manner with a pad over the tracheotomy orifice. Many persons who have had a tracheotomy performed have thin shrunken necks with the tracheotomy opening deeply recessed, while others have the wound still unhealed or discharging and requiring frequent clearance to avoid blockage. Should blockage occur while wearing the pad device the patient might have to risk suffocation or remove the pad and risk inhalation of gas, and this is a serious objection to this type of device.

It was also evident that a pad device would require individual fitting by a surgical appliance maker, and that the efficiency of the fitting could be proved only by a test in a respiratory irritant gas—for example, chlorine—since C.A.P. in concentrations which are highly lacrimatory does not irritate the respiratory passages. Such a test would be impracticable for general use. Finally, owing to the opening being situated at the base of the neck in the majority of cases, it is normally covered by the clothing, and access to it for adjusting the pad would accordingly not be easy in an emergency.

It was clear, therefore, that for general application the only type of device which could be relied upon for complete protection in all cases was a hood, which enclosed the head and extended downwards so as to cover the tracheotomy opening, provided with a means of supplying air to the interior. A device of this type was designed and successfully submitted to comprehensive tests. As a result the helmet respirator has been produced and is now available for distribution to suitable cases upon production of a medical certificate.

The Helmet Respirator in Operation

It consists of a hood of impervious rubberized fabric, suitably stiffened at the corners so that it retains its shape and does not collapse on to the wearer's head, fitted with non-inflammable eye-pieces and a rubber air-supply unit by means of which the wearer pumps air to the interior. Attached to the hood is a skirt of porous fabric which is shaped to fit the wearer's shoulders, and the respirator is secured to the person

by strings which draw the back and front portions of the skirt together under the armpits. A standard respirator container is fitted inside the air-supply unit so that all the air passes through the container before entering the hood. The air enters the hood immediately in front of the wearer's tracheotomy opening, which was found to be an important point affecting comfort. The air leaves the hood around the bottom edge through the porous fabric of the skirt. The hood is made of such a size that the wearer can, if desired, cease pumping for a few minutes without ill effects. Should blockage of the tracheotomy tube occur while wearing the helmet respirator, the wearer can readily slip one hand up inside the hood in order to free the blockage.

Persons who have undergone tracheotomy form only a small proportion of those who cannot wear a standard respirator. Others may be classified in the following groups: distorted head—for example, acromegalics; large tumours of face and neck; old operation cases leaving gaps—for example, removal of part of the jaw—and tender scars resulting from injury, war wounds, etc.; severe respiratory disability, as in acute asthma, phthisis, and old cases of empyema. The helmet respirator is intended for use in all such cases, and its suitability for the purpose has been fully demonstrated by trials. It is of particular benefit in cases of acute asthma. In addition, it should find application in hospitals for persons with severe facial and head injuries. It must, however, be emphasized that because of supply difficulties resort should not be had to the helmet respirator where the ordinary respirator with outlet valve will suffice.

Both the civilian respirator face-piece with the outlet valve and the helmet respirator will be provided at the discretion of local authorities, and not as a right, to members of the public who need them on medical grounds, on production of a medical certificate, provided the present respirator is surrendered in serviceable condition. The form of certificate, as set out in a Ministry of Home Security circular, is as follows:

Medical Certificate

I certify that

(Name) ..... of

(Address) .....

.....

is suffering from (specify disease or condition*)
and on that account is incapable of exerting the respiratory effort necessary for wearing the ordinary civilian respirator.

Delete one of these { The case would be met by a respirator with an outlet valve.
{ The case appears to require a respirator helmet.

Signature and qualifications of registered medical practitioner .....

Date .....

* The kind of conditions requiring a face-piece with outlet valve are: chronic asthma, fibrosis of the lungs, tuberculosis of the lungs, cardiac disease, severe anaemia, advanced age and infirmity, extreme corpulence. The kind of conditions requiring a respirator helmet are: tracheotomy, facial distortion (whether natural, due to tumours, or the result of surgical operation), extreme dyspnoea, severe cardiac disease, advanced tuberculosis.

The circular deals with the charges that will be made where the present respirator is not surrendered in serviceable condition, and with the needs of hospitals for the helmet respirators, it being estimated that a substantial part of the demand for the latter will arise in institutions. The circular concludes with a recommendation that medical officers of health should get in touch with members of the local medical profession and arrange for them to see the new devices and to form a common policy on the giving of certificates.

The Ministry of Health has asked local authorities for simple four-weekly totals of new notifications of tuberculosis, the period of the first return to be for the four weeks ending January 25, 1941. For comparative purposes similar returns of past notifications covering the four weeks ended January 28, 1939, and succeeding four-weekly periods are also to be supplied. Copies of the circular containing these directions (No. 2257) have been sent to medical officers of health.

PROBLEMS IN RECEPTION AREAS

PUBLIC HEALTH AND SOCIAL WELFARE

It would be idle to disguise the fact that evacuation on a large scale in this country is neither a natural nor a popular process. The clash of the London and the country woman when brought into the same kitchen, and of their children when attending the same school, might well have doomed the experiment to failure, yet thanks largely to the efforts of voluntary associations and local authorities, and also to the mutual forbearance in the majority of cases of the people concerned, it has largely disappointed the gloomy prophets. Still, there are crooked places in the home counties and elsewhere, and to make them straight the Minister of Health recently appointed a small committee under the chairmanship of Mr. Geoffrey Shakespeare, M.P., whose reference was to inquire into the welfare of evacuated persons.

The committee, which has just reported,[1] visited these areas in seventeen counties. The normal population of the areas visited is about six and a quarter million, and this has been swollen by roughly one million evacuees who have been officially billeted, and some 600,000 unorganized evacuees who have made their own arrangements.

Welfare Arrangements

The report has a good deal to say about billeting and requisitioning of houses, and urges the establishment of what it calls buffer hostels to relieve temporarily the strain on hostesses. Adequate welfare facilities, it declares, are the essence of good reception arrangements, and these should include the establishment of clubs for mothers, combined where possible with communal feeding, nursery centres, and bath houses and laundry facilities on a communal basis. There are, in fact, already 265 communal feeding centres in the reception areas. There is need for more welfare officers to be appointed to the regional staffs of the Ministry of Health. Some women welfare officers were appointed last summer to the Ministry's staff in the regions most affected, and their number has been increased during recent months, while others have been appointed by local authorities. But there is a shortage of women for this service. The suitability of hospital almoners and women public health officers for these posts is emphasized.

One great problem is that of the difficult or special cases not suitable for private billeting. These include, on the one hand, children suffering from skin diseases, who should immediately be sent to premises converted into sick bays, and, on the other, those addicted to bed-wetting, the emotional children, and the delinquent, who require special care under trained supervision. The committee urges the establishment or taking over of hostels by the county authority in order that different types of children may be treated separately, and the provision of one hostel at least in each county for difficult older boys. Already the number of hostels for difficult children in the reception areas is over 500.

Strenuous efforts have been made to dispatch parties of children in a cleaner and healthier condition than at the beginning of the war, but a new factor has now entered—namely, the evacuation of children, not from schools, but from shelter life. The committee considers that where possible children should be received in emergency hospitals, or temporary hostels in which they can be rested and cleaned before being billeted, and that there should be powers to examine, and if necessary to cleanse, adults who may be in a state unfit for billeting in private homes. Actually powers were taken last December for the compulsory medical examination of children in shelters and those thought to be affected in health by war conditions, and for the cleansing of adults frequenting shelters.

Hospital Services and Medical Treatment

Emergency arrangements to deal with sudden epidemics have been enjoined by the Ministry of Health on all local authorities, and buildings have been assigned for this purpose; it is

[1] *Report on Conditions in Reception Areas*, H.M. Stationery Office, 3d. net.

recommended that these buildings be immediately adapted for this use. Accommodation for infectious diseases is still insufficient, and it is considered that there should be provision in all the regions for measles cases where there are complications or where the billets are unsuitable for home nursing. It is stated that the Ministry is making every effort to increase the accommodation available and has reserves in view. The District Medical Service should be extended, and the cost of its extension should not fall on local rates; also, where the burden of the treatment of official evacuees falls on the voluntary hospitals it should be chargeable to the evacuation account. Those who subscribe to voluntary hospitals contributory schemes in the sending areas should be able to enjoy the benefits in the reception areas. This last recommendation is said to be under consideration, and as for the District Medical Service, local authorities were asked last November to review their services and extend them as necessary, the additional costs being reimbursed in full by the Exchequer.

The provision of maternity homes is said to be generally sufficient, but more ante-natal and post-natal homes are required. The need for such hostels was impressed on local authorities at the beginning of the war, but shortage of suitable accommodation is again the limiting factor. The number of maternity homes in reception areas is 130. One difficulty is that the burden of billeting the mothers and babies when they leave the maternity home falls on the one district where the home is situated, and the committee considers that arrangements should be made for placing these cases over a wider area. Many authorities have hostels or clearing houses where elder children can be billeted during the mother's confinement, but more temporary residential nurseries are required for children under 5 to serve the same purpose. There are nearly 200 residential nurseries in the reception areas, and the number is being increased as rapidly as suitable premises and trained staff can be found.

A general increase in the scales of allowances for the boarding of unaccompanied children would probably have gone a long way to reconcile the reception areas to the strain which has been put upon them, but the committee does not see its way to make such a recommendation. It does, however, recommend that the allowance of 5s. a week to the householder for the nursing of a sick evacuee child should be increased on a medical certificate that extra comforts or nourishment are needed. The Ministry states that the case for increasing the home nursing allowance is being investigated.

Local News

IRELAND

Honorary Degrees

Dr. Gordon M. Holmes, F.R.S., Dr. F. M. R. Walshe, and Prof. Ernest Hey Groves are the recipients of the Honorary D.Sc. of the National University of Ireland, the two former "in view of their eminence as neurologists and in recognition of their valuable contributions to medical literature," and Prof. Hey Groves "in view of his eminence as an orthopaedic surgeon and an internationally recognized authority on the literature of the subject."

Eire Health Statistics

The public health statistics for Eire for the year 1938–9 show improvements in many directions. Notifications of the principal infectious diseases totalled 8,065, as compared with 8,677 for 1937 and 8,924 for 1936. The figures for diphtheria were, however, disappointing, 2,983 cases being notified as against 2,511 in 1937. The report of the Department of Local Government and Public Health states that diphtheria continues to be "one of the major problems of public health" and that "the spread may in part be accounted for as resulting from the intensive propaganda that has been carried out recently against immunization." Decreases were recorded in the notifications of typhoid fever, scarlet fever, and acute primary and influenzal pneumonia. The death rate from all forms of tuberculosis was 1.09 per 1,000 of the population, the lowest rate ever recorded. Deaths of infants under 1 year were fewer in 1938 than in 1937 and 1936, the rates being respectively 67, 74, and 73 per 1,000 births. The infant mortality rate for the county borough of Dublin was 96, and it is suggested in the report that a causative factor is the failure of Dublin mothers to breast-feed their infants. Progress is reported in the administration of free-milk schemes, maternity and child welfare approved schemes, and the work of the school medical service.

ENGLAND AND WALES

Mental Health in Wartime

In a Chadwick Lecture with this title given on February 4 at the Royal Society of Tropical Medicine and Hygiene, Sir Walter Langdon-Brown said that the ostensible reason for the outbreak of a war was never the real one. Emotional causes were transformed into alleged rational ones, although deep-seated and hidden causes of antagonism were at work. The fierce fanatical outbreak of nationalism in this century became comprehensible as a frightened response of the nationalist segregating impulse against the demand of the evolutionary process towards internationalism. If a normal healthy impulse was forcibly repressed it came to the surface again in an abnormal pathological form. Thus the collective values which ruled the world up to 1914 had been swept away, and people had become hardened to shameless persecutions, betrayals, and predatory invasions in the name of the deified State. The division that arose was between nations who considered that the individual existed for the State and those who thought the State existed for the individual. The background against which the present war was being waged was a moral and spiritual disease in Europe resulting from attempts to stem the tide of the evolutionary process. Both constructive and destructive impulses were always present in the human mind, and to-day the latter had the upper hand. When war came the gregarious instinct was always interrupted and nations looked for a leader. He might not have the characteristics attributed to him, but he must have an emotional appeal. There was also a tendency to the making of myths and to reliance on rumour. Information was the best antidote, and was the more needed now that wireless had enormously increased the power of the lie. The greatest enemy to be overcome was fear, which was really an exaggeration of a normal protective impulse. For years insidious propaganda had been instilling fear into the nations. The fear of being afraid was particularly distressing, and the best remedy was action as a member of a community. Pessimism and fear were chiefly prevalent among those who were not contributing to the national effort. It was already clear that an exaggerated estimate had been formed as to the liability of air raids to produce nervous breakdowns, and the way the people were facing them was evidence of this. The nature of panic fear called for consideration, and certain steps taken by the Government deserved criticism in this respect. The importance of everything designed to maintain physical fitness in the cave-man's existence to which we were now condemned could hardly be overstressed; for to revert also to the cave-man's primitive ideas of sanitation would indeed be treason to Chadwick's memory. Vitamin A had a very real value in promoting adaptation of the eyesight to the blackout. Various other measures were discussed in relation to the maintenance of mental health.

J. Pley (*Thèse de Paris*, 1940, No. 338), who records three cases in patients aged from 29 to 44, illustrated the rarity of traumatic enophthalmos by the fact that Birch-Hirchfeld in 1930 was able to collect only 164 cases from the literature. It consists of a progressive sinking-in of the eyeball following an injury in the region of the orbit with an interval of varying duration. A lesion of Tenon's capsule appears to be the most logical explanation of the condition. Besides this indispensable lesion are secondary causes such as paralysis of sympathetic origin, atrophy of the intraorbital fatty tissue, and cicatricial retractions.

Reports of Societies

FRACTURES OF THE JAW: SURGICAL AND DENTAL TREATMENT

At a meeting of the Section of Odontology of the Royal Society of Medicine on January 27 Mr. A. H. McINDOE gave a review of 119 cases of fracture of the upper or lower jaw and of their surgical and dental treatment at an Emergency Medical Service Maxillo-facial Unit during the period from the outbreak of war until the end of 1940. He spoke appreciatively of the help given by Sir Harold Gillies and Mr. Kelsey Fry, who had guided the surgical and dental policy of the unit. The results obtained were not due to one person but reflected the combined efforts of a team.

Statistics of Cases

Fractures of the mandible numbered 82, of the maxilla, 37; in 7 cases both mandible and maxilla were fractured. Of the 119 cases, 68 were without other injuries. The associated injuries varied from extensive soft-tissue lacerations to fractures of long bones or skull. The greatest number of cases were among fit young men on active service, but a number also occurred among older people during the bombing of the civilian population. The causes in 43 of the cases were bomb and shell fragments and mine explosions; in 9, gunshot wounds; in 16, collapse of buildings; in 23, road collisions; in 8, plane crashes; and in 18, blows, kicks, or falls. Of the 82 mandibular fractures, 78 were complete, 21 being single, 22 double, and 35 multiple and comminuted. Ten of these fractures had loss of bone requiring bone graft. The excessive violence of the trauma in many cases tended to produce a much more severe injury than was encountered in ordinary civil practice. There was a high incidence of unilateral and bilateral condylar fractures. Of the 37 cases of maxillary fracture, 20 were unilateral, 8 bilateral, 5 were "middle third facial" crush fractures, and 4 were partial alveolar.

Immediate Treatment

The initial treatment of the soft-tissue injury differed from that adopted in similar injuries in other parts of the body where radical excision of the damaged tissues and removal of all foreign bodies was essential at the earliest moment. The good blood supply of the facial tissues and jaws and their well-known resistance to infection allowed greater latitude, though early suture of the soft parts and immobilization of jaw fragments undoubtedly gave the best results. In the unit the plastic surgeon dealt with the facial injury, and the dental surgeon made impressions, localized fragments, and prepared and adjusted splints.

Within the first twelve hours facial injuries might be sutured with impunity, provided great care was taken to cleanse the wounds thoroughly with soap and water and saline and to remove (with a steel curette if necessary) all foreign bodies and dirt which might have been ground in. Non-viable pieces of bone only were removed, and extreme conservatism was practised in regard to pieces which had the slightest chance of survival. Excision of wounds was unnecessary except for removal of non-viable tissue or to make accurate suture of severely damaged skin edges possible. The mechanical possibility of wound suture largely depended on whether tissue had been lost. If the amount of lost tissue was such that undesirable tension was produced, and especially if the displacement of the fragments was perpetuated or increased, it should not be attempted. It was remarkable how well a facial wound, packed widely open with saline gauze, would heal in the absence of all tension. All compound injuries of the jaws associated with external wounds should be adequately drained at whatever time they were seen. Delay in healing was often due to inadequate initial drainage.

Fractures of the Mandible

The soft-tissue suture, when this was required, having been completed by the plastic surgeon, the dental surgeon took over, his aim being the permanent immobilization of the fragments and the clearing up of sepsis in the fracture lines. Mr. McIndoe discussed various methods of immobilization. The method of choice, for several reasons, was cast-metal cap splints—for example, they gave positive fixation and stable immobilization; they could be modified so as to be applicable to practically all except edentulous cases; and there were no wires to break or readjust.

To control sepsis the teeth in the fracture lines were removed, especially those with broken and septic roots, though where only one tooth remained on a fragment it should be retained as long as it was of value in immobilizing the fragment; also unerupted third molars lying in fracture lines were best left until sufficient consolidation had occurred to make removal safe. Careful irrigation of the fracture cavity and a rigid toilet of the mouth were essential if sepsis was to be prevented. Food must not be allowed to collect between the bone ends. During the period of immobilization, and particularly in comminuted fractures with perforating wounds, sequestra were extruded. If a purulent discharge persisted beyond six to eight weeks the fracture cavity should be gently curetted and any dead fragments of bone removed. In simple fractures the splints were removed after four to six weeks and the mandible tested for union; they were reapplied for a further four weeks if this was not sufficient.

Fractures of the Maxilla

As the degree and direction of maxillary fractures were directly related to the severity and direction of the blow producing them and not to muscle action, early disimpaction and immobilization of the fragments were essential. The responsibility for forcible manual reduction of these fractures rested with the plastic surgeon, who should be able to hand the case over to his dental colleague with the fragments repositioned and ready for splinting in normal dental occlusion. Bilateral maxillary fractures constituted the most serious problem, and in some of the conditions encountered it was of great importance that the fractures should be disimpacted at once, for if consolidation occurred replacement was extremely difficult. Immobilization depended on finding a point of resistance upon which to splint within the bony facial structure, or, if none was available, creating one by external means. Thus moderate displacements of the maxillary arch could, after replacement, be splinted to the lower teeth with full upper and lower cap splints. Elastic traction was of use in making minor adjustments in position. If the maxilla was very loose and the antral superstructure was intact, upward traction with a Kingsley type of splint and plaster head cap was advisable.

Complications and Sequels

A considerable number of severe compound fractures of the jaws, particularly those due to perforating missiles, resulted in obliteration of the buccal sulcus to such an extent that the satisfactory fitting of dentures was impossible. Almost all cases which had to be bone-grafted fell into this category. It became necessary then to deepen the upper or lower buccal sulci by dividing the adhesion between the lips and alveolar surfaces and to line the resultant cavity with a skin graft. A few cases of mandibular fractures, particularly the high condylar lesions involving one or both temporo-mandibular joints, developed trismus. In the early stages an exerciser was used to keep constant pressure against the temporal muscle pull and maintain a full range of movement. If this failed it was necessary to resect one or both condyles, including part of the mandibular neck, to form a false joint. The jaws were fixed together for one week, after which the exerciser was used to regain movement.

Of the cases treated 12% had been bone-grafted. In general a gap of 1 cm. uncrossed by periosteum and without intervening viable bone fragments would result in non-union. There was practically no limit to the size of the gap which could be satisfactorily grafted. The practice of the unit was to strive for occlusion with union wherever possible, but if good occlusion was not compatible with union because of bone loss, non-union with subsequent bone-grafting was willingly accepted. A bone graft was not inserted until four to six months had elapsed from the last signs of sepsis. During this time the fragments were splinted to each other by the rigid bar type of cap splint, or splinted to the upper teeth in the

more extensive unilateral losses. The iliac crest graft had entirely supplanted other methods. Bone from this source was tough, could be bent and shaped, was highly osteogenetic, and was easily obtained in amounts sufficient for the smallest or largest bone graft without disability to the patient. The grafts, after shaping, were wired accurately between the exposed fragments, using stainless steel ligatures. Union should be firm in four weeks, and movement could then be allowed.

TRANSFUSION OF BLOOD DERIVATIVES

At a meeting of the Section of Medicine of the Royal Society of Medicine on January 28, Sir MAURICE CASSIDY presiding, a discussion took place on the therapeutic value of transfusion of derivatives of blood.

Colonel LIONEL WHITBY said that it was desirable to recognize the limitations of blood derivatives, and also the fact that the exigencies of war were not necessarily to be copied in peacetime practice. The summoning of a blood donor was often highly inconvenient, while the conveniences of the blood bank were obvious, so that there was a temptation to lower the therapeutic ideal. The object of a given transfusion should always be clearly defined, because almost all derivatives of blood lacked one or more of the properties of fresh blood and had therefore a limited therapeutic value. As a general rule derivatives of blood were efficient for the purpose of the blood volume restoration essential to the treatment of secondary shock, but stored blood might be quite useless for oxygen-carrying capacity, though a good deal depended upon the age of the stored blood, and blood a few days old might be almost as good as fresh.

The order of preference of blood derivatives used for blood volume restoration had been experimentally evaluated as follows: citrated plasma, serum, haemoglobin-Ringer, gum saline, red cells in saline suspension, and isotonic saline and glucose. The clinical evaluation of the advantages of plasma over serum or vice versa had not yet been fully decided. A serum preparation, dry or fluid, was technically much easier than plasma. For blood volume restoration in secondary shock an innocuous protein fluid which was retained in the circulation was required. It was necessary not only to restore blood pressure but to maintain it, and the only satisfactory means of maintaining blood pressure was of a protein nature.

As for the transfusion of other substances, 25% haemoglobin-Ringer was quite efficient for restoring and maintaining blood volume, but it had the grave disadvantage that the haemoglobin was a foreign pigment and had to be excreted. Gum saline was reasonably efficient, but it had certain disadvantages, the most important being the difficulty of making one gum saline solution similar to another. As to the transfusion of glucose, this was subject to the same drawback as saline—namely, evanescence. Extensive experience had shown that, though citrated plasma was very satisfactory, it was an advantage to use a proportion of blood when the volume restoration was required to be large. In treating 100 air-raid casualties 165 pints of plasma had been used, the maximum administered in any one case being six pints. Rigors, mild and transient, were exhibited in only three cases. He added that the effect of the transfusion should be carefully controlled by serial blood-pressure observations as well as clinical judgment.

Experience in Air-raid Casualties

Dr. JANET VAUGHAN (with whose work on this subject Dr. Helen Brown was associated) described the results obtained at the North-West London Blood Supply Depot, where plasma, serum, and concentrated red cells had been analysed. The observations made under air-raid conditions were necessarily qualitative rather than quantitative, because the casualties were not often suitable for accurate controlled studies. If there appeared to be little variation in relative therapeutic value or toxicity of the derivatives, then other factors, important in wartime, such as ease of preparation, of storage, and of transport, had some title to be considered. Both filtered and unfiltered plasma with an approximate protein content of 4% to 5% had been available for clinical control, and reconstituted dried serum and filtered serum had also been tested, the latter with a protein content of 7%, while the protein of the former was dependent on the concentration at which it was given. On the question of relative toxicity of plasma and serum as opposed to stored blood, relatively large quantities of both had been used during the last four months, and there had been no report of a really serious reaction. With either filtered or unfiltered plasma only a very few cases of mild rigor and rise of temperature had occurred. In only a few cases had filtered serum been used; two of these cases showed a mild reaction (in one the serum was cold, and when it was warm no reaction was obtained).

Experience had led her to believe—although assessment was difficult—that plasma, serum, and blood were equally effective in the treatment of patients with "shock," by which she meant patients who had collapse associated usually with trauma, with a lowered body temperature, and a state of terror. As some degree of anaemia had frequently been found in air-raid casualties, it was probable that the best results would be obtained on the administration to such patients of both blood and protein fluid. In the case of burns, when haemoconcentration occurred plasma or serum was to be preferred to blood in the first twenty-four hours. Cases of burns were very likely to develop local oedema in the region, and on giving concentrated serum at that stage this local oedema vanished as by magic. In the late septic stages of burns fresh blood, so long as it was obtainable, was to be preferred to any of the derivatives.

No great difference in the dosage of blood, serum, or plasma had been noted. Dried serum had the additional advantages that it did not clot, was not readily infected, was uninfluenced by temperature, and had small bulk. If fibrinogen was found to be of importance in treatment, then it must be recognized that plasma was superior to serum, but at the moment from the practical standpoint serum was the preferable fluid. With regard to concentrated red cells, the type of cases which had benefited had been anaemia in elderly subjects requiring immediate operation, anaemia associated with sepsis, and aplastic anaemia. All the blood derivatives had proved their use, but more detailed studies were needed to assess their precise therapeutic value.

In a brief discussion Dr. DAVY said that although Dr. Vaughan had given reasons for preferring serum to plasma, from the point of view of the person who was running a blood bank the availability of plasma was a consideration. Dr. MAIZELS also said that while as a counsel of perfection it would be better to use serum, the practical usefulness of plasma in the case of blood banks must be remembered. It would be wrong to think that infection with plasma was of a serious character. It was almost unavoidable in some degree, but by careful precautions, using a separate outfit for each bottle, the infection rate in his own cases had been lowered to 2%. Dr. QUIST described two cases of burns sustained during the fire of London on December 29 which bore out the good results ascribed to concentrated serum. Dr. MOLLISON said that in giving a suspension of red cells it was a distinct advantage to have a count of more than 7,500,000.

Colonel WHITBY took up a remark made by Dr. Vaughan that 400 c.cm. of reconstituted blood serum was sufficient for the treatment of secondary shock. The treatment of secondary shock was an entirely individual matter. There must be large numbers of cases in which 400 c.cm. was sufficient reasonably to restore blood volume, but the only criterion of how much was required was to be determined by individual examination of the blood pressure or by other methods in particular cases. These average figures meant nothing; each case was an individual matter. Dr. JANET VAUGHAN said that she was sorry if she had given the impression that there was any automatic dosage for the treatment of persons with shock. The only guide was the patient's condition. The point that she had wished to make about dosage was that there seemed to be relatively little difference between the sort of dosage which was being used by a large number of casualty officers not all under the same direction. They were using approximately the same quantities of serum, plasma, and whole stored blood. But she agreed that each case must be judged on its needs.

Correspondence

Treatment of Scabies

SIR,—Dr. H. M. Berncastle's method of treating scabies (January 25, p. 135) is by no means original. Thomas Bateman, in his *Synopsis of Cutaneous Diseases*, first published in 1813, makes the following statement: "Among the remedies appropriated to the cure of Scabies, Sulphur has long been deemed, both by the vulgar and the erudite, to possess *specific* powers. The common people treated this disease with this substance alone, a century ago, administering it internally in milk and applying it externally in butter and Hog's-lard. In less violent degrees of Scabies, and in the purulent species affecting the hands and wrists, perhaps no improvement can be made upon this practice. The latter species, when it occurs in children, is often readily removed by the internal use of this medicine alone, or in combination with a neutral salt, independently of any external application."

Anthony Todd Thomson, in his *Practical Treatise on Diseases Affecting the Skin* published after his death in 1850, writes: "But Scabies is seldom treated by topical remedies only. Sulphur is usually administered internally at the same time, and, when strong objections to the use of the ointment exist, the disease may be cured solely by the internal administration of the specific. It is given in doses of half a drachm night and morning daily, either in milk, or, as the common people employ it, mixed with treacle in the form of an electuary. It undergoes a chemical change in the habit, combines with hydrogen, and is exhaled by the skin in the form of sulphurated hydrogen; a fact exemplified by the blackening of silver worn in the pockets of those taking it."

It must be noted, however, that neither Bateman nor Thomson believed that the acarus was the cause of the disease; the latter considers that: "Sulphur operated, either chemically in changing the nature of the poison which has caused and keeps up the disease: or by some specific action on the capillaries, preventing the formation of more of the poisonous secretion constituting the virus, whilst that already formed is thrown off by the skin." He adds as an afterthought: "There can be little doubt, however, that the insect is also destroyed during this process." How he arrived at this latter conclusion he does not state, and it is not clear that he ever obtained an acarus from any of his own cases, though he had been shown it by others. Bateman frankly admits that he had never found an acarus in any of his cases.

Ferdinand Hebra, the great Viennese dermatologist, who may well be called the founder of experimental dermatology, had no doubt as to the cause of scabies. He not only constantly demonstrated the presence of the acarus, but also experimentally produced the disease by placing acari on the skin and observed the development of the lesions. In his monumental work on *Skin Diseases* (English translation by New Sydenham Society) he writes: "Even when it was still contended that Scabies had its origin in a dyscrasia, all practitioners were agreed that, in order to cure it, it was necessary to use local applications. And yet till quite recent times it has been maintained that the external must be aided by internal treatment, in order to ensure radical cure of the disease and to prevent it being followed by any injurious consequences to the patient. But while this was the opinion of physicians, the quacks and 'old women' had more sense, and adopted a reasonable and simple treatment, by which they succeeded in gaining both credit and money, after their learned competitors had failed. If medical men in those days had but observed with unprejudiced eyes the favourable results which followed the use of popular remedies and cures for Scabies, they probably would have much sooner acquired correct notions concerning the nature and treatment of the disease."

Even though views as to the causation of scabies had changed, it is difficult to believe that a remedy—which was evidently at one time in constant use—would have been discarded if it had been as effective as Dr. Berncastle imagines. Scabies has increased very much during the last ten or twelve years and may increase still further as a result of war conditions. If this increase is to be stopped, efficient treatment is essential. Inefficient treatment may convert an active into a latent case, one in which the symptoms are relieved but the disease is not cured and remains infectious. It would therefore seem advisable to employ methods of proved efficacy rather than those in which it has not yet been possible to control the results experimentally.—I am, etc.,

London, W.1, January 27. A. M. H. GRAY.

Treatment of Wounds with Bipp

SIR,—Prof. R. J. Willan's letter (January 11, p. 62) urges me to write in support of the claim he gives to the late Prof. Rutherford Morison as the originator of a new principle in surgery. I was among those who began to practise treatment with bipp in the early days of the war in France, following Morison's technique, and later while serving as consulting surgeon to the Second Army I was able to observe many varieties of wound treatment and to see the early favourable results of hundreds of cases treated with bipp. As so often happens when new methods are introduced, failure to carry out the technique correctly—leaving large quantities of bipp in the wound—was often the cause of bad results.

At one time considerable controversy arose, chiefly because of occasional bad results and a certain amount of prejudice, between those working at the base and at the front as to the merits of bipp. The chief rival to bipp at that time was the Carrel-Dakin treatment. Good as this method was, it required considerably more after-attention than the bipp method and was not nearly so convenient for early transport. Both methods depended for success on the efficiency of the primary surgical treatment, and probably there was little to choose when this had been carried out *secundem artem*.

I think it may be claimed that bipp treatment was a, if not "the," progenitor of the vaseline pack, because it inaugurated a continuation of paraffin drainage (I am no advocate of primary suture as part of the technique when sepsis has already occurred), rest, fixation, and infrequent dressings, combined with an antiseptic base. It is difficult to know whether the gradual liberation of iodine was an added factor, though reasonable to suppose that it was, as Morison believed. At the present time this principle has been perfected with impregnated gauze pack and rigid plaster fixation (not necessarily closed). Whether the use of flavine or other dyes in the pack adds to the safety of the method remains uncertain. There is little doubt, however, that the local use of sulphanilamide combined with its internal administration adds considerably to the value of the up-to-date pack-fixation treatment of wounds and has produced results unobtainable in the last war.

Prof. Morison obtained astonishing results with bipp on cases with well-established infection, and it would be reasonable to give this method a re-trial in those late cases where established infection does not justify wound excision.

Since the last war, like Prof. Willan, I have employed bipp for the abdominal wall in cases of acute suppurative appendicitis, etc., before the peritoneum is opened, in a considerable number of cases, followed up by primary suture without drainage. It often happens that the wound in such cases tends after a varying interval to break down in varying degrees as the result of an infection of the muscle wall during the operation, a result which can often be avoided by a film of bipp over the wound surface. I have not the reference by me, but a series of these cases in which bipp was used was compared with a similar series in which bipp was not used by my chief assistant, Mr. (now Lieutenant-Colonel) D. Coyte, and the results, which were very favourable to bipp, were published, I think, in the *St. Bartholomew's Hospital Reports* some fifteen years ago.

Another valuable field for bipp is peri-anal suppuration (ischio-rectal abscess, fistula, etc.). Frequent dressings are avoided, pain eliminated, and healing accelerated. Although in the modern surgery of infection we are moving away from antiseptics and pinning our faith to chemotherapy, fixation, avoidance of dressings, and protection against ward infection from every source, I believe there is still a place for bipp, which has certain merits of an almost uncanny nature.—I am, etc.,

Jan. 18. C. GORDON WATSON.

Treatment of Burns

SIR,—I have never been satisfied with the treatment in general practice of burns and scalds. I realize the improvement brought about by the introduction of the tannic acid method, but I am not enamoured of it for a couple of reasons I need not dwell on now.

The following case may interest my colleagues. About two months ago I was called to attend a woman, 88 years of age, whose nightgown had caught fire on an electric heater. The burns extended from the middle third of the right thigh, up over her buttocks and up to the right breast and on to the front of chest. Practically the whole area was blistered, and in five places, each about the size of one's palm, the burn was deeper and the flesh blackened. She was so badly shocked that I had little hope of her recovery from this, and I had no hope of her surviving the accident. After the usual treatment for shock she rallied, and I decided to treat the burns with 2% gentian violet solution. (The *Practitioner* had just published an interesting article on this treatment.) I exposed a small area of the burn region and poured the solution over it, heating the solution beforehand to blood heat. This was allowed to dry and then covered with gamgee tissue. The rest of the burn was treated in a similar manner and the dressing carried on twice daily for ten days. The injured surface remained clean and healthy. I might mention here that I gave the patient 3 grammes of sulphapyridine by injection in the first twenty-four hours. She ran an uneventful course, and after ten days I changed to the following healing ointment:

R	Resorcin.	... gr. iij
	Adip. lanae	... ʒ ij
	Ung. zinc. oxid.	... ʒ ij
	Vaselin.	ad ʒ j

The deep burns required a few applications of copper sulphate. The patient has recovered completely and is going about as usual.—I am, etc.,

Bray, Co. Wicklow, Jan. 21. H. J. RAVERTY.

SIR,—May I supplement the appeal of Mr. Cohen (November 30, p. 754) for the continuation of the tannic acid regime in the treatment of burns? It is tragic that a method of treatment which has been approved should be condemned because of the appalling results shown by medical officers who have had no previous experience in the treatment of these cases. Apart from burns complicated by gunshot wounds, I have seen no conditions in wartime burns which were not well recognized in the teaching general hospitals. There, also, we not infrequently saw bad results from coagulation, due entirely to ignorance or criminal carelessness.

Many of us have already tested the alternative methods recommended, but abandoned them in favour of one of the modifications of the Davidson principle. When the war clouds loomed on the horizon, I, like others in teaching hospitals, reviewed the methods at our disposal, in consultation with medical, surgical, and pathologist colleagues. The conclusions were similar to those so ably set out by Mr. Cohen. Admittedly the coagulant varies with different surgeons, but in extensive injuries it is essential that coagulation should be rapid and "adequate," and these conditions are best fulfilled by some modification of the Bettman technique. If the face and hands alone are burned (the common distribution in Air Force casualties), speed is not so essential. In the former type of injury we are concerned primarily with saving life; in the latter the probable ultimate result is our first concern.

In some 300 cases of burns of the hands and fingers (many of them in children) I have never seen necrosis of the phalanges or disastrous crippling of the fingers which could be blamed on the tannic acid. The danger of the constricting effect of the tannic acid coagulum has been recognized for many years, and we should all appreciate that constant supervision is necessary. The danger of corneal ulceration and the possibility of ectropion resulting from burns around the eyes should be equally well known.

Every burn should have unremitting care and attention, and it is perhaps unfortunate that so many burns recover uneventfully in spite of lack of attention. This fact has led to an impression that the burn is cleansed and coagulated, and ten to fourteen days later the coagulum peels off and the patient is cured. When this routine is upset by toxaemia or sepsis it is thought to be "just bad luck." *Any* burn may "go wrong," and it is only by constant attention to all cases that improvement in results can be obtained. The use of the triple dye in itself will not lead to improved results. I abandoned this method as a routine, as I found the coagulum required even more attention than a tannic coagulum supplemented by dye. Saline baths also require time and care. If we admit that adequate supervision of these cases is impossible, then we should revert immediately to the pre-Davidson era, and admit defeat.

Although I am very much on Mr. Cohen's side, I disagree with him on one or two minor points. Like him I use a modified Bettman technique, but I do not coagulate burned eyelids and malar regions in every case. Superficial burns here heal well with saline compresses, or under 1% gentian violet. In the deeper burns early Thiersch grafting obviates the risk of ectropion. I consider that coagulation in this region is much more dangerous than coagulation of the fingers.

Secondly, the tannic acid–silver nitrate coagulation is rapid, but I have had to deal with sailors and airmen with extensive burns (40% to 60% of the body surface) who were too severely shocked to be satisfactorily dealt with in this manner. Several of these men suffered multiple gunshot wounds, and the need for speed was pressing. The face and body were tanned in the usual manner, while the limbs were rapidly bandaged with a gauze roll soaked in 20% tannic acid. If the shock was very severe, the patient was morphinized and the burned areas wrapped in gauze soaked in tannic acid, without preliminary cleansing. Twenty-four or thirty-six hours later the burns were cleansed and re-tanned, where necessary under gas-and-oxygen anaesthesia.

My final difference of opinion is on the distribution of patients throughout general wards. I prefer to segregate them in a ward by themselves, or at least to isolate them from "dirty" cases. This surely reduces the incidence of sepsis, and the staff of the burn ward become very enthusiastic and, I think, have a whole-time job.

I sincerely hope that others will voice their opinion in this controversy.—I am, etc.,

WALLACE M. DENNISON,
Major, R.A.M.C.

Dec. 4.

Cut Tendons

SIR,—The recent discussion on tendon injuries may give rise to unwarranted optimism regarding the flexor tendons among those who have little opportunity to see these cases. I have attempted a number of primary and secondary repairs by modern non-traumatic methods without benefiting a single patient, and have never heard of a case where a flexor tendon divided in its digital sheath has been restored to usefulness by suture. The plastic reconstructions described by the American surgeons are outside the range of all but a few specialists, and their value is still in doubt.

When flexor profundus is divided it should be left alone, as the finger is still useful. It usually retracts through the perforation in flexor sublimis, and cannot be retrieved without endangering the function of that tendon also. If both tendons are divided the hopeless prognosis should be told to the patient, and amputation considered in relation to economic and occupational conditions. If a tendon is partly divided little can be gained by inserting suture material, which only adds to the inevitable and crippling inflammatory reaction. Divided tendons not in synovial sheaths can be repaired satisfactorily by excision of the wound, the tendon ends, and all damaged tissue with primary suture.

I am sure that any surgeon who can produce case records in which suture of a flexor tendon in its digital sheath has led to useful voluntary movement at the corresponding interphalangeal joint will soon excite considerable interest in his methods. In the hands of most of us the prognosis is quite hopeless.—I am, etc.,

Bradford, Jan. 25. J. CLAPHAM COATES.

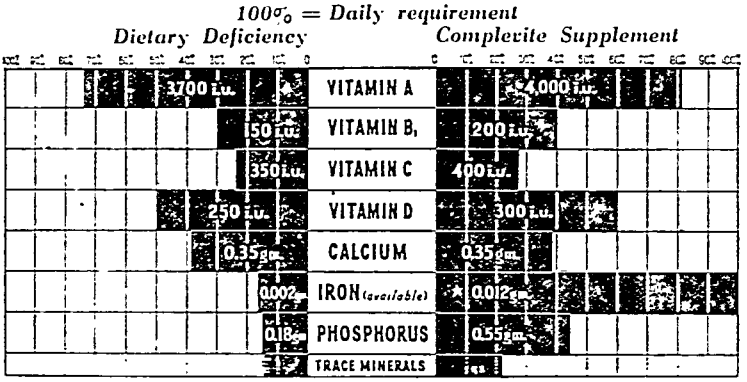
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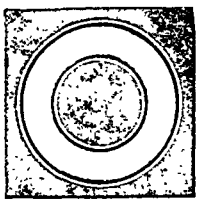
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"On the chest service the procedure has been adopted as a routine."

1940. PROC. SOC. EXP. BIOL. & MED., 43, 401.

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SIR,—Since Mr. A. Wilfred Adams gave a good prognosis for tendon suture (November 30, p. 765) many diverse opinions have been expressed, many of them pessimistic. Dr. T. B. Jobson's letter (January 25, p. 138) again brings up the subject, stressing accurate suture, asepsis, and care not to injure the sheath unnecessarily.

There remains one other means of preventing adhesion of the tendon—the use of cellophane. After suture has been accomplished by fine linen thread, the line of suture is surrounded by cellophane, which is easily sterilized. A small portion is placed in position to form a minute tunnel, and its naturally gummy surface when wet allows it to adhere to itself, so that rarely even a stitch is required. After adequate immobilization, followed by active and not passive movement, the results in the few cases in which I have used the method, which is not original, are excellent.—I am, etc.,

Upper Deal, Kent; Jan. 29. C. G. S. MILNE.

Amniotic Membrane for Cerebral Adhesions

SIR,—In connexion with Dr. Wilder Penfield's statement (November 16, 1940, p. 668) that unboiled amniotic membrane is unsafe to use by reason of its fatty content we desire to record the following observations.

Both the boiled and unboiled membranes prepared by us according to Dr. Penfield's instructions have a large and almost equal fat content. This fat manifests itself as intracellular clusters of fatty droplets probably representing fatty degeneration. The only apparent change effected by boiling is to transform the membrane to an extremely puckered, shrunken, and friable state. The fat is not removed to any considerable extent by boiling as recommended. In view of these findings we feel that any difference in results observed by Dr. Penfield from the use of the boiled and unboiled membrane should not be attributed to alteration of the fatty content of the membrane. Probably some other factor has been responsible.

Fat can readily be removed from amniotic membrane by the use of fat solvents, and the membrane can be sterilized and maintained in good condition as follows: (1) amnion is carefully separated from chorion and put into acetone for fifteen hours; (2) rinsed in 70% methylated spirit in water to remove acetone, and stretched upon rough towelling to dry for twenty-four hours; (3) cut into convenient pieces and all discoloured or stained portions rejected; put into ether for a further twelve hours; (4) wash the etherized amnion through 70% spirit (as in step 2), and again dry upon rough towels for twenty-four hours.

To sterilize: Sterilization is effected by interleaving each sheet of prepared membrane with grey filter paper. A board (half-inch-thick teak or cedar for minimum warping) is placed on top and bottom of the pile of sheets, and the whole is wrapped in a cloth and autoclaved for ten minutes at 5 lb. pressure, followed by vacuum 5 lb. for another ten minutes.

Our observations, however, do not enable us to state whether the effective removal of fat in this way is of practical value for the purpose in view.—I am, etc.,

Royal Infirmary, Edinburgh, Jan. 19. L. J. LE VANN.

Spinal Anaesthesia

SIR,—In his article, "The Surgery at No. 3 General Hospital" (December 7, p. 794), Major Rex Binning, referring to spinal anaesthesia and advocating the lateral approach, states: "By avoiding the tough intraspinous ligament one is less liable to bend a fine needle and it eliminates the need for a Sise introducer." This sentence raises a number of points connected with the technique of spinal anaesthesia, and I hope to substantiate my claim that the midline approach is at least as satisfactory as the lateral, if not, indeed, more so. An advantage of the midline method is the absence of lateral angle of introduction. The distance from skin surface to dura mater certainly varies in different individuals, and this in itself can upset calculations of angles of introduction.

The tough intraspinous ligament and Sise introducer are both easily overcome by the following slight addition to the technique. After preliminary local anaesthesia of skin and area of track with the agent to be used, approximately two-thirds of the actual track is prepared by the insertion of a Record syringe needle of the same diameter as, and half the length of, the lumbar puncture needle to be used. When this is withdrawn a hole will remain, and it is a simple matter to direct the lumbar puncture needle along it and then through into the spinal canal. Actually, in practice, the skin itself often forms a tough barrier to the lumbar puncture needle, a problem also solved by the sharper and shorter preliminary needle.—I am, etc.,

H. L. ROGERSON.
Major, R.A.M.C.

Mental Health Administration in the Provinces

SIR,—Your leading article on "Hospital Administration in the L.C.C." (January 11, p. 56) is very timely. The fact that some of the mental hospitals are now being used partly as general hospitals makes the present time particularly favourable for the suggested fusion. Such fusion is an urgent necessity in the Provinces. In many provincial counties one finds a complete lack of co-operation between the municipal general hospital, the mental hospital, and the mental defective colony, each is run by a separate committee.

The recent report of the B.M.A. Committee on Mental Health includes a model scheme for the treatment of mental illness, and there is a recommendation that a Central Advisory Committee should be set up in each area to devise a co-ordinated plan for that area. (These committees would be composed of representatives of voluntary hospitals, medical schools, and voluntary organizations dealing with mental health and mental defect, and educational and health representatives from public authorities.) This appears to be an excellent recommendation, especially as the term "area" obviously implies a grouping together, where desirable, of several counties; in fact, it foreshadows the regionalization of the mental health services.

Now this whole question of the replanning of the hospital system of the country on a regional basis has just been brought sharply into prominence by the letter from the Minister of Health to the Chairman of the Nuffield Trust which was published in the *Journal* of January 18; and the *Times*, in a leading article, commenting on the work of the Nuffield Provincial Hospitals Trust which Lord Nuffield founded to promote a general scheme of regionalization of the hospital service, points out that full participation by the public health authorities was one of the binding conditions.

From these considerations it seems quite clear that before the local mental health services are in a position to set up influential central advisory committees or to take part in any useful regionalization scheme, there must be full co-operation with the local public health authorities, and to this end amalgamation of public health and mental hospital committees is the first necessity. Not until this is done will it be at all easy to form central advisory committees which will carry any weight. And as this need for co-operation is so much greater in the Provinces let them "go to it."—I am, etc.,

Warwick, Jan. 20. FRANCIS PILKINGTON.

Convulsion Therapy in the Out-patient Department

SIR,—It is more than unfortunate that when the nation is likely to make calls on psychiatry which it may find difficult to meet owing to the limited number of trained psychiatrists available, the discussion on convulsion therapy is degenerating into an undignified wrangle. It is unhappily a fact that the practice of psychiatry in Britain is carried out in two compartments (or in three if we include mental deficiency). Much progress has been made in recent years in all branches, and while, on the one hand, it is foolish and incorrect to state that on admission to the mental hospital the mental disorder is necessarily far advanced and that in a few weeks the "asylum psychosis" (whatever that is) has been added to the original disorder, on the other hand the suggestion that a psychiatrist of recognized standing may never have known what an advanced psychotic is like is unseemly if no worse.

Experience of both classes of patients shows that for the most part the psychoneurotics respond to psychotherapy in an

out-patient clinic, while the psychotic, even if a very early case, reacts best to in-patient treatment in a hospital where proper classification and other "progressive" methods are available.

There are exceptions in both groups, and as new methods of treatment appear—electrically induced convulsions may prove to be one such—this generalization may not indefinitely hold good. While it exists, however, many psychiatrists, possibly the majority, tend to see one or other rather than both classes of patient. Each may thus be in a position to speak with authority as regards his own sphere, but we have a right to expect at least moderation when voicing opinions concerning the position of others.—I am, etc.,

W. J. T. KIMBER,
Jan. 29. Medical Director, Hill End Hospital and Clinic.

Bromide Therapy and Intoxication

SIR,—I am sorry that it should have become necessary for Dr. Francis Pilkington (January 4, p. 10) to have written such a lurid and depressing account of bromide intoxication. As he says, bromides are some of the most valuable drugs to be used in wartime, and I am surprised how often I find patients apprehensive of taking them. They seem to have no difficulty in swallowing those "beastly barbiturates"—made in Germany—though we have been warned often enough of their dangers.

It is remarkable how confidently, and as a matter of course, sisters at nursing homes ask: "And what shall she have to-night, doctor?" usually meaning a tablet with a name ending in "l." On the other hand, bromide is so useful; there is no need to give large doses, or even give continuous doses. Ten or fifteen grains given occasionally is often quite enough to soothe an active imagination. Bromides quieten thoughts, and a dose taken by a normal individual will give a day or two's respite to an imagination becoming too vivid. The patient soon learns to know when he wants another help to steady him. Of course, we all know this, but we did not know the terrible effects of an overdose or intoxication, and I have not seen a case in thirty years of practice.—I am, etc.,

Mortehoe, Devon, Jan. 25. H. M. RAVEN.

Acute Bronchiolitis in Children

SIR,—In their article on "Acute Bronchiolitis in Children" (January 25, p. 107) Drs. Douglas Hubble and G. R. Osborn stress the importance of obstructive dyspnoea. Although this disease does not often come the way of the thoracic surgeon, I have sometimes diagnosed such a spreading bronchial infection as an early complication of lobectomy for bronchiectasis. As far as such experience will allow, I fully endorse the treatment they recommend.

I am particularly interested in the question of bronchoscopic drainage. No amount of bronchial suction could be expected to aspirate tenacious plugs from the bronchioles, and if it could be ascertained that this was the only lesion, bronchoscopy would seem to be contraindicated. It may happen, however, that other factors are contributing to the dyspnoea, and of these the most important are secretion in the main bronchi, swelling of inflamed bronchial mucosa, enlargement of hilar glands, possibly some bronchial spasm, and also that unexplained phenomenon of a greatly reduced cough reflex. As Chevalier Jackson says in the quotation used: "The cough reflex may be entirely absent." Where these crippling factors are present to prevent lung drainage, the most dramatic relief may be obtained by bronchoscopic aspiration and spraying of the mucosa with a solution of decicaine and adrenaline. A discussion on the ways in which bronchoscopy helps would be out of place here, but I am sure that the air let in is as important as the secretion removed.

It is difficult to persuade a physician that a child who is in the last stages of respiratory failure would benefit from what is regarded as the suffocating process of bronchoscopy. One of the disappointments of the treatment is that in a very severe infection the obstructive agents may return within a few hours.

In one small boy of 9 years whom I treated in consultation with Mr. G. S. Seed the infection progressed to extreme respiratory obstruction in twelve hours from the onset of the first symptom. In spite of deep cyanosis, straining chest, and moist sounds over both sides, there was no cough. At bronchoscopy I found a reddened larynx and trachea, a deeply congested and broadened carina, and both main bronchi still further occluded by thick blood-stained secretion. When the suction tube touched the carina, coughing started and much thick secretion was aspirated. The effect of bronchoscopy was just as dramatic as tracheotomy in laryngeal obstruction. The child was immediately at peace. Obstruction recurred again an hour later and coughing was again absent. As bronchoscopy was obviously not going to be possible every hour, a tracheotomy was performed. A feather was passed down to the bifurcation of the trachea every half hour. This stimulated the cough and caused the expulsion of secretion. The child recovered completely in three days. To-day I should leave a bronchial catheter in place after bronchoscopy and so avoid a tracheotomy.—I am, etc.,

Leeds, Jan. 27. P. R. ALLISON.

SIR,—Drs. Douglas Hubble and G. R. Osborn in their article on acute bronchiolitis (January 25, p. 107) have drawn attention to the importance of this condition from the clinical point of view, but it is also of medico-legal importance. Sudden death from capillary bronchitis may take place in infants without previous symptoms sufficient to suggest serious illness. Death often takes place during the night, and should this occur while the child is in bed with its parents there is a risk that death may be attributed to overlaying, as the post-mortem appearances are those of death from asphyxia and the condition of the lungs may be overlooked unless a careful examination is made. In these cases the parents usually state that the child and often the whole family had suffered from a catarrhal cold, and a common and curious feature in the history is that the baby is believed to have recovered or at least to have passed the acute stage of the catarrhal illness when death occurs.—I am, etc.,

Wakefield, Jan. 28. P. L. SUTHERLAND.

Epidemic Influenza

SIR,—While appreciating Major C. H. Stuart-Harris's plea (January 18, p. 96) for patience with the research workers in elucidating the cause or causes of influenza one feels, as a clinician, that it is possible, once any virus is discovered, to approach the problem from a biased point of view so that, instead of seeking a cause, there is a tendency to seek only that virus of which one knows.

If, as Major Stuart-Harris states, he is unable to distinguish on occasion clinically at the bedside those cases which yield, for example, virus A from those which do not, then surely it is reasonable to suggest that none of these cases is due to virus A but to some other as yet undiscovered cause, be it virus or otherwise, rather than that 30% should be ascribed to virus A and the other 70% to the unknown infection.

You, sir, have suggested something of the sort in one of your leaders of last year, and one feels that such an approach is more likely to lead to the ultimate solution of the problem.—I am, etc.,

Highgate, N.6, Jan. 25. W. LEES TEMPLETON.

Sunlight Treatment

SIR,—In his excellent letter (January 18, p. 97) Dr. F. Howard Humphris ignores one of the most important actions of actinotherapy—the tonic action of general irradiation with a good strong erythema-producing dose. Presumably, in common with myself; there are practitioners who possess mercury vapour lamps, and who have experimented upon themselves until they have ascertained the most effective dosage: some of them, too, maybe love the sunlight and have learned how long to bask in it. Theirs are the opinions I should rather like on the matter of correct dosages.

Personally I find that my optimum dose is that producing a bright erythema, which appears within two hours, reaches its maximum in six to eight hours, and has not completely disappeared in thirty-six hours, and which leaves the skin slightly more pigmented than it was before. Desquamation is apparent in four to six days' time. In length of time such an exposure

is between two and two and a half times as long as the "minimal erythema dose." The effect of the bigger dose is to produce a feeling of well-being and renewed energy—a sort of "I-don't-know-what's-the-matter-with-me-I-feel-so-grand" feeling. Appetite is sharpened, and if bedtime supervenes rapid and deep sleep is enjoyed. A single dose relieves asthmatic attacks. Repeated exposures prolong the tonic effect, grant varying periods of immunity from asthmatic attacks (*British Medical Journal*, January 4, 1936), and enable convalescent and debilitated children to regain their lost body weight more than twice as fast as their controls (*Brit. J. phys. Med.* October, 1935).

It may be of interest to record the signs and symptoms that obtained (and were noted down at the time) on the five occasions when I have deliberately incurred over-exposure to ultra-violet light. These exposures were from twice to four times my "normal" dose; further than that I never dared go. At the time and for an hour afterwards there is nothing to warn one of what is coming. Within two hours the skin is "burning" too much to be comfortable. Within six hours the skin is exquisitely tender, the tongue is white-furred, there are headache, nausea, irritability, terrible depression (almost suicidal in intensity), and a positive craving for sleep, which becomes an obsession, and one can think of nothing except bedtime. Within twelve hours there is most offensive diarrhoea, after which the toxic symptoms rapidly disappear. Desquamation begins within twenty-four hours; large sheets flake off revealing "new skin" still erythematous. The last overdose I took deliberately was within five hours of a Turkish bath, at which all the superficial dead skin had been massaged away. On this occasion the toxic symptoms were excessive, tachycardia was suffered for three days, but there was no desquamation. The same symptom-complex obtained with two of my earlier patients to whom I inadvertently gave overdoses. A third patient (an asthmatic) had in addition delirium, painful swollen joints, and oedema of the eyelids—all suggestive of serum-sickness.

The effects of over-exposure appear to be transient, as with most other forms of intoxication. Latent septic foci, however, will sometimes light up, and it is said to be dangerous where active tuberculosis of the lung tissue is present. But is not the minimal erythema dose rather feeble? I am sure that our homoeopathic colleagues do not prescribe flashlight baths.—I am, etc.,

Vale Royal, Cheshire, Jan. 22. GEORGE DAY.

SIR,—I am sorry that Dr. F. Howard Humphris suggests (January 18, p. 97) that my letter (December 21, p. 883) decries actinotherapy and the mercury vapour lamp. I did not intend to do this. The observations he has made are of interest, as I know that they are based upon many years of clinical practice.

Without entering a long discussion on the energy of sources of light, expressed in physical terms—that is, ergs per sq. cm. per sec.—the various types of quartz mercury vapour lamps generally used in actinotherapy are relatively "cold" sources of light emitting a high intensity of ultra-violet rays which have powerful erythema-producing action. Other sources of light are more suitable when infra-red luminous or the longer wave-lengths of ultra-violet rays are prescribed for light therapy. In actual clinical practice the quartz mercury vapour lamp is most suitable for production of erythema reaction of the normal skin, and can be employed for general light therapy or local intensive counter-irritation therapy. Dosage needs supervision and control. I have advocated a technique of dosage which I have called "short-ray therapy"; unfortunately an error in printing inserted "short-wave therapy"; this needs no further comment.

By this method of treatment the minimal erythema-producing dose of rays of light is applied to an area of skin 12 in. by 12 in. An interval of ten to twelve days is allowed to elapse between the time when any of the selected skin areas are again irradiated. The advantages of this method of treatment are: (1) The dosage is accurate and can be correctly repeated by others. (2) Laboratory research supports this technique, for the optimum response of the bactericidal power of the blood will follow such irradiation. The exposure of large areas of skin will reduce the haemobactericidal power. (3) The skin is kept in a constant light-sensitive state. Immunity and resistance to erythema reaction of ultra-violet rays will follow thickening of the epidermal cells and hyperplasia caused by repeated weak and suberythema doses of ultra-violet rays. The penetration of the short wave-lengths are arrested. (4) The dangers of "overdosage" are prevented; these may occur when wide areas of skin are irradiated. (5) Suberythema and weak doses may be insufficient and of no therapeutic value, as the biological reactions of ultra-violet rays follow an "all or nothing" law.

There is little doubt that the longer wave-lengths also have therapeutic value; the observations made by Kovacs are well established, but if the high-pressure quartz mercury vapour lamp is to be used for this purpose it is necessary to screen or weaken the short wave-lengths of ultra-violet rays as long exposures are needed. Other lamps are more suitable for this purpose. The quartz mercury vapour lamp is a valuable agent for the treatment of disease and the maintenance of good health. Its use is most suitable in hospital, in private practice, and in industry, but the best results will follow correct supervision of apparatus, personnel, and dosage. Caution is needed when such lamps are installed in factories, the home, and elsewhere.—I am, etc.,

London, W.1, Jan. 27. ALBERT EIDINOW.

Effect of Morphine after Cholecystectomy

SIR,—A paragraph in Mr. Michael J. Smyth's article on exploration of the common bile duct for stone (January 25, p. 111), describing recent work on the action of different drugs on the sphincter of Oddi, explains to me a long-standing puzzle, and brings forward a point that may be of some practical importance at this time. Ever since a cholecystectomy many years ago a patient has shown what I wrongly supposed to be an idiosyncrasy towards morphine and its derivatives, even the tiny dose of codeine in a veganin tablet causing severe pain, now for the first time easily understood. There must be in the country a fair number of people without gall-bladders, who are potential air-raid casualties and to whom, if they become casualties, a full dose of morphine will probably be administered by a doctor who knows nothing of their medical history. One supposes that, far from relieving their pain and shock, this may increase it.

It is clearly impossible to obviate this risk completely, but I have given to my patient a note as follows to keep in the cover of her identity card.

IMPORTANT NOTE

A cholecystectomy has been performed. Morphine in *any form* causes spasm of the sphincter of Oddi with severe pain.

If morphine has been given or is absolutely necessary pain due to it can be relieved by

Inhalation of capsule of amyl nitrite *or* glyceryl trinitrate, gr. 1/100.

I have advised the patient to carry one or two amyl nitrite capsules with her.—I am, etc.,

North Shields, Jan. 27. J. B. WILLIAMSON.

The British Drug Industry

SIR,—In an article under the title "Rationalization of the British Drug Industry" in your issue of December 21, 1940, you take editorial responsibility for opinions which we submit are unjustified by the facts of the case. The official character of your journal makes it necessary for the Association of British Chemical Manufacturers to indicate to your readers certain of these facts. We therefore ask your courtesy in giving us space for this purpose and for making explanations which may help to remove the misconceptions to which your article has given rise.

The drug industry, like others born under a British system of free competition, is composed of a number of units in course of development. These are not, however, as you state, crowding each other out. On the contrary, through our Association, they are working closely together, and, contrary to your assertion, they have done so increasingly during the past year, though we readily admit that a still greater degree of co-ordination is desired by many of our members.

In addition to maintaining their own research departments, many British firms do also in various ways regularly lend considerable aid to research work carried out in the laboratories of universities and medical schools, and the suggestion

that they make no contribution whatever to such work stands in need of revision.

We acknowledge that greater unity in the naming of new drugs is desirable. Indeed, with this end in view, it was the Association of British Chemical Manufacturers who in 1939 first sought the help of the British Pharmacopoeia Commission in giving names for drugs formerly not made in this country that were known by registered trade names of foreign origin. These pharmacopoeial names are, with few exceptions, now used generally by members of the Association of British Chemical Manufacturers, although frequently in addition to their own registered trade marks. The purpose of the latter, however, is not to disguise the nature of the drug, but to identify it as the product of a particular manufacturer.

Your statement that it is due to the initiative and drive of the Medical Research Council that the drugs in the Addendum have been so quickly made available in this country also needs correction. Long before the war the British drug manufacturers took the initiative in asking for medical advice as to what drugs not already made here were to be considered as really essential to the medical profession. The Medical Research Council gave this advice, but it is due to the initiative and drive of the manufacturers and to the fact that they had previously established strong research and production departments that these drugs in the Addendum, as well as many others, have quickly been made available to the medical profession in a state of purity and in adequate amounts by the members of our Association.—We are, etc.,

THE ASSOCIATION OF BRITISH CHEMICAL MANUFACTURERS.
166, Piccadilly, London, W., Jan. 30.

The B.M.A. and Medical War Issues

SIR,—The *Journal* of January 4 contains a letter from Dr. Margaret Lowenfeld containing the following paragraph: "As a profession we are responsible to the people for their health. Is it not time we roused ourselves and as a body saw to it either that the Central Government makes use of those powers we have delegated to it or that by other and more direct means this objective is gained? *We have in the B.M.A. the necessary instrument to collect information, disseminate it, and see that pressure is brought to bear on the authorities. Let us take responsibility for our part of the war and 'go to it.'*" (The italics are mine.) In the same number of the *Journal* is a report of the last Council meeting, at which I made (not for the first time) similar remarks.

At the moment there is one important issue about which the Association is in a position to collect information and bring pressure to bear on the authorities so that the requisite action may be taken—and that is the medical aspect of the invasion we have been told by the Prime Minister to expect.

We have been told to stay put in the event of invasion. We know that the unprotected population flying from the intense aerial bombardment contributed in no small measure to the defeat of France. Does our experience in the bombed cities lead us to suppose that the refugee population in the reception areas will stay put in the event of an intense bombardment unless there is some reasonable protection? However high may be the morale of the civilian population in reception areas, we must consider the possibility that, in the face of the kind of attack we are expecting, they will try to escape by dispersing throughout the countryside. Leaving out all military considerations, have full medical preparations been made to deal with the disruption caused by this dispersal? Such a dispersal may well give rise to a spate of epidemics, and, apart from this, it will entail serious effects on the mental and physical welfare of the future generation.

A question that has been asked me more and more of late by doctors in my area is, "What are we expected to do in the event of invasion?" They want to be prepared for their duties, and so far as is possible in advance. Has the Association taken this matter up with the proper Departments? Is it decided which doctors should remain? Has the treatment of casualties in the civil population or in the Home Guard in the event of invasion been considered? If there is information on these points, is it not important that it should be disseminated as soon as possible?

The medical risks of a dispersal of the population in the event of invasion would be to a large extent lessened if there were adequate protection for the civil population in the reception areas of the country. Although such protection is primarily a military matter, it has a vital bearing on the medical aspect and is therefore one on which the Association should make its voice heard. In this connexion it is a matter for regret that the Association has not taken an active interest in the construction of shelters. Here again the questions of security against bombs and security against disease are closely linked, and if we are to envisage a long war it is still not too late for the Association to take this matter up.

In the report of the last Council meeting in the *Journal* of January 4 there is a reference by a member of the Council to the use of the *Journal* and the futility of ordinary committee methods. I agree that ordinary committee methods are futile at a time like this and believe that the columns of a weekly journal have the disadvantage that information in it does not lead to speedy action. The present machinery of the Association is adapted for the single purpose of obtaining personnel for the Forces and not for that of dealing quickly with day-to-day problems. What machinery is there for seeing that speedy action may be taken on vital matters? I would suggest that there is none, and also that it is still not too late for us to modify our organization so that we can more promptly meet the urgent needs of the moment. Relevant to this matter is the following quotation from an article in the *Sunday Times*, in which it was stated that the recent fire of London "revealed certain facets in the English character—a certain inability of the unimaginative official mind to prepare sufficiently in advance against the anticipated but unexperienced."

Let us, therefore, form a small body open to receive suggestions whose watchwords will be "speed" and "action," a body to prepare adequately in advance against the anticipated, so that it will no longer be possible to level against the Association that accusation—"too slow" or "too late."

Finally, may I say that a draft of this letter was shown to the Chairman of the Council before publication.—I am, etc.,

Birmingham, Jan. 31. S. WAND.

Medical Planning Commission

SIR,—The almost simultaneous publication of Sir John Orr's recent address (*Journal*, January 18, p. 73) and the details of the Medical Planning Commission (*Supplement*, January 4, p. 1) is indeed a blessing, for the former has given you, Sir, an opportunity to criticize it in the same spirit which has animated the minds of those who are responsible for the formation of the latter.

While there can be no quarrel with the essential medical points raised in Sir John's address, there is, as already evidenced by your public correspondence, a great deal of dismay and dissatisfaction with the manner in which the Medical Planning Commission has been constituted and the qualifications of its personnel to consider contemporary medical problems of fundamental importance, and your leading article (p. 91) on Sir John's address may swell the dissatisfaction, for it does not indicate that one of the main points raised in this address has received that wider and more intelligent consideration that is its due.

In the first place medicine of the future must be closely bound up with politics, and the sooner that fact is realized by the profession the sooner will we get a really intelligent survey of the problems which concern us. In the second place politics in the past has inevitably meant party politics, but it need not so remain in regard to medical matters if the profession can convince the public in the meantime that it has set its own house in order and is able to produce a cast-iron case for reform in practically every branch of its work. If the profession can produce such overwhelming evidence, as indeed it can and must, no political party would dare oppose or question such evidence, and the result would be a general acceptance by all political parties of this evidence.

How, then, must the profession proceed to make such a possibility a reality? The answer is simple enough to any unbiased mind—namely, the setting up of a commission composed of men and women who have practical experience of the many and complex problems which must figure in its terms of reference; and how extensive these terms of reference must be I hope to indicate at a later date. The reason for the discontent in regard to the present Medical Planning Com-

mission is due to the fact that the personnel has not been chosen with any real comprehension of the issues at stake, and until such a commission is appointed any findings of a commission with such obvious limitations as the present Medical Planning Commission, as constituted, will not carry the weight or authority of the profession, and will have the further unfortunate effect of misleading and puzzling politicians and public alike.—I am, etc.,

London, S.W.1, Jan. 28. R. PROSPER LISTON.

SIR,—While probably all are agreed upon the necessity for action the Medical Planning Commission as proposed has so many hostile critics that it would be wise to consider whether a better scheme might not be devised. It is clear that most of the criticism is caused by the fear that one interest or another will not receive due consideration; another ground of objection is that younger members of the profession are not adequately represented. It must be admitted that the findings of so large a body must depend on the votes of the majority, and as a consequence points of importance to a relatively small section may, if not presented with sufficient force and logic, be lost sight of, especially as an unbiased and judicial attitude cannot be expected from a body of men so many of whom have been appointed to represent sectional interests.

I suggest that a better method would be to appoint a small body, say six members, half from general practice and half from consultants and specialists, chosen only for their ability to form an impartial opinion and with a reputation for sound judgment, together with a chairman from outside the profession, perhaps a legal authority who would at the same time view the problems from the point of view of the general public, the patients. Witnesses, who would be chosen to represent all sections of the profession and all aspects of the problem, would give evidence before this commission. In due course a report would be prepared which might be expected to be impartial and comprehensive.

Such a small commission might be appointed by the Medical Planning Commission as at present constituted and the report when prepared would be presented to them. Later the report and their observations upon it would be made public for wider criticism, and the Commission might then formulate a scheme to be put into practice at the appropriate time with the whole weight of the profession behind it.—I am, etc.,

Buxton, Feb. 1. CHARLES W. BUCKLEY.

SIR,—Every right-minded practitioner will agree with the letter of Dr. Alfred Cox (January 11, p. 61) in commending the Association's initiative in setting up the Medical Planning Commission. The constitution of the Commission, however, is causing considerable misgiving, although, of course, no possible exception could be taken to any individual member. It seems probable that 90% would be a more correct estimate of the proportion of the profession made up by general practitioners than the 80% of Dr. H. Dundas McCall (January 25, p. 132). On the Commission there are only eighteen members whom the most elastic standard of classification could describe as general practitioners, while there are twenty-nine consulting surgeons and physicians, seven other specialists, and three deans of medical schools.

Many will be rendered still more uneasy by the fact that they agree with Mr. P. L. Giuseppi's vision (January 18, p. 97) of a full-time medical service. But among general practitioners there is a growing feeling that their interests, which they believe in health matters to coincide with those of the nation, are not likely to be best sustained by the hands of consultants. It is not many years since many of our eminent colleagues were constantly assuring us that the family doctor was the backbone of the profession. But we do not forget that at the same time agreement was reached with a Ministry of Health scheme which had the effect of driving the thin end of the wedge between the general practitioner and the practice of midwifery, and which may ultimately lead to the complete disappearance of that part of his practice. And in spite of hopeful words, encroachments upon general practice grow daily.

If a full-time service should ever come into being, the importance of the part which the Association can play in its delivery cannot be exaggerated. But it can only play such a part if it can command the solid confidence and support of all ranks of the profession. I submit, Sir, that it is urgent that such a pronouncement shall be made at once as shall silence once and for all suspicions of the kind expressed above.—I am, etc.,

Croydon, Jan. 23. J. NEWTON HUDSON.

Medicine in a Changing World

SIR,—Sir John Orr in his lecture on trends in nutrition expresses his conviction that what may be termed the creation and preservation of "positive" health of body and mind of the community is the primary duty of the medical profession. Naturally it should accompany or precede the reorganization of the preventive and curative medical services in the more limited sense of these terms.

Sir John Orr's address shows good "visibility" and comprehensiveness and is medical planning on a national basis, the only complete and lasting form of planning, and is refreshing. In it he claims that doctors should take their rightful place as citizens in the "New World Order," of which we hear much, and he makes certain recommendations to bring this about. He refers to the recent letter by Dr. R. W. L. Ward in the *Journal*, which says that "the profession has been too much occupied with its own remuneration and failed to recognize the responsibilities towards the bigger issues of national life." He advises the British Medical Association to define the conditions which we, as doctors, would plan as necessary for the benefit of the needs and health of the people in our social and economic systems. This would require a reconstitution of the functions and composition of the Medical Planning Commission, but it would be well worth it.

In your leading article on medicine in a changing world in the same issue you remark that "medicine cannot concern itself with the economic man, the political man, the religious man, or the legal man." Again you say that on such subjects as diet and nutrition doctors must speak in medical terms only, "uncontaminated with political partisanship or economic theorizing." Why so? Are there no honest men and women and sound knowledge in these and all callings of life? Indeed a good number of doctors, including myself, have practised such collaboration for years and found that many of these people would promote and advance the conditions doctors advocate. Our experience tells us that *if* the British Medical Association in drawing up the plans for the common health and welfare *ignores* the knowledge of the economists (who work out their financial aspect), or the help of the politicians (who would make honest laws to ensure them), or the lawyers (who would formulate these laws), or the men of religion (who practise and preach the lesson of the Sermon on the Mount), or, may I add, the cobbler who makes our shoes or the public who is to take our advice, then the Commission and the British Medical Association are again doomed to failure.

We shall be regarded as "shadow" doctors only and as a body of emasculated citizens, not full, free, equal, and good ones, unless we ask and call in any and all necessary technical advice and enlist the active personal support of one and all, and the good will, common sense, and co-operation of all good citizens, and translate our "prescription" into active scientific "treatment." Professional remuneration can be rightly left to the respect and the resources of the State and the community that provide the payment (and take our treatment) by mutual arrangement with the doctors and their allied and auxiliary colleagues, all of whose status and services would be enhanced in value.—I am, etc.,

Woking, Jan. 20. F. G. BUSHNELL, M.D.

SIR,—Your leading article on medicine in a changing world and the policy of the B.M.A. presumably expressed in this article should come as a shock to no one. The individual practitioner, by the very nature of his work, has the opportunity of becoming the most knowledgable of citizens, and by virtue of his scientific training is tempted to inquire into the political, economic, and other causes giving rise to the disease of mind and body affecting his patients. Knowledgable and scientifically minded citizens are potentially very dangerous to the peace of mind of Government Departments and centralized bureaux; they ask inconvenient questions at inconvenient times, and tend to start other members of the community thinking about the whys and wherefores of our present social disorder.

Your implied advice to the individual practitioner that he should be careful not to let Sir John Orr put dangerous ideas into his head, but instead be a busy little doctor getting on with his doctoring, so avoiding political and economic contamination, is most timely. So many members of the community already are under the impression that they are engaged in a war to defend the liberties of citizens against the tyrannies of power-drugged Governments and bureaux. That the cobbler must stick to his last and probably eschew any spare-time process of critical thought or inquiry inherent in good citizenship is, if disregarded in a totalitarian State, so apt to lead to liquidation.

Happily the individual practitioner has, in large part, been saved from these dangerous, citizenly activities by being allowed the barest minimum of spare time. He can now see that the close co-operation of the B.M.A. with the Ministry of Health, resulting in the increasingly onerous terms of service under the Ministry of Health and under central and local government bodies, has ensured his being kept safely tied to his stethoscope.

An editorial caveat against listening to the broadcasts of Mr. J. B. Priestley might guard the individual practitioner from this source of citizenly contamination.—I am, etc.,

Trentham, Jan. 27. R. CRICHTON PEATE.

SIR,—Surely you dismiss Dr. Maitland Radford too summarily. If we accept Sir John Orr's conclusions (and I take it they are not seriously questioned by the profession), then, since the nation will have to take action, we shall be expected to give some kind of a lead. Action will be political action, so we cannot keep politics out of it. But are we not citizens as well as doctors, and citizens with a special responsibility in this matter? Where but in our professional journals should we discuss ways and means to end this deplorable national failure? Of course there will be differences of opinion: of course our individual party politics will colour our arguments; but out of a free discussion some practical proposals may emerge upon which we can concentrate.—I am, etc.,

London, W.1, Jan. 30. C. E. WHEELER.

The Myotonic Pupil

SIR,—As a friend of the late W. J. Adie's my opinion on the direct issue which Mr. R. Foster Moore's letter (January 18, p. 99) raises would inevitably be too biased, and I refrain from expressing any. There are others with fuller knowledge of the circumstances and therefore better qualified to speak concerning Mr. Foster Moore's particular plaint. (It may, however, not be inappropriate to point out that Dr. F. M. R. Walshe, in his recent book *Diseases of the Nervous System*, speaks simply of the "myotonic pupil.") I have been interested to hear in conversation various and contrary opinions expressed on Mr. Foster Moore's letter. Might not the occasion afford an incentive to a discussion of more general interest—for example, on the historical significance of the value attached to academic eponymy, as an implement of success and power, in its broad relationship to various outstanding trends in our present-day Western civilization?

In a previous letter (October 23, 1937, p. 827) Mr. Foster Moore himself confessed that "claims for priority are apt to be undignified," but when we take into consideration the spirit of the times we should allow that there can be justification for such anxiety. In an age which measures "success," "cleverness," etc., on the basis of journalistic "scoops" those of us who might in other circumstances prefer the tranquillity of the study may have little choice than to acclaim our wares from the house-top as the only alternative to relative extinction. The significance of the modern value attached to "priority" in matters of "observation" is a very important aspect of competitive professionalism, if only because it has such a harmful influence on teaching.

It would be interesting to hear a discussion on this subject, and if Mr. Foster Moore's letter reveals—as it probably will—the impossibility of arriving at finality on such a small and particular issue as he raises, it will have served a useful purpose if it initiates some clarification of much more general considerations which its publication stimulates.—I am, etc.,

London, Jan. 27. BASIL GRAVES.

SIR,—It is clear that both your correspondents, Dr. Parkes Weber and Dr. Pappworth, have found published cases of abnormal pupil reactions which we may accept as examples of the condition under discussion; Dr. Pappworth refers to a case so early as 1813, and, as he very properly says, earlier cases may have been reported. No one, I fancy, would accept the publication of a single case of a condition as being sufficient to justify the application of the term "syndrome" to it; Dr. Pappworth does not state whether any of the published cases referred to by him are sufficiently comprehensive to justify such a term.

Had there been any inaccuracy in my letter it would be proper that it should be pointed out, and as such has not been done it may be taken that its accuracy is accepted, that in fact the characteristics and definition of the condition based on my series of cases were published in 1924—that is, a number of years before Adie published a single case of it. Dr. Pappworth says that my publication "has never received the recognition which it has deserved" because it was published in a specialized journal. Can he, however, suggest a more suitable medium for the publication of a group of cases of abnormal pupil reaction than the *Transactions of the Ophthalmological Society of the United Kingdom* and a textbook on medical ophthalmology? And, in any case, it was in the former *Transactions* that Adie published his cases six or seven years later.

I should like to say one further word on what Dr. Parkes Weber calls "wrangling on the question of priority" and Dr. Pappworth refers to as "haggling." Neither of these remarks seems to me in any way applicable to a letter which was a statement of facts which were left to speak for themselves; there was no mention of priority; it may, however, be noticed that Dr. Parkes Weber goes on "to claim priority" for a single case of his colleague and himself, and is sufficiently dogmatic to state that "this was the first demonstrated case" of the condition.—I am, etc.,

Salisbury, Feb. 3. R. FOSTER MOORE.

Medical Examination of Home Guard

SIR,—Dr. E. Wynne-Jones's letter (January 25, p. 137) was especially interesting in regard to the suggested appointment of a medical officer to each Home Guard battalion. This surely should be considered an absolute essential for any unit such as the Home Guard, who are undertaking active service and who, necessarily, should have not only a medical officer but also medical personnel to deal with casualties; also plans must be made in advance so that these casualties may be effectively treated and evacuated.

In the Edinburgh zone Home Guard medical officers have been attached to all the battalions since August, and they have had plenty of work to do, not in examining volunteers as Dr. Wynne-Jones has done, but in training personnel in first-aid work, forming battalion and company first-aid posts, looking after the various sanitation problems which arise, and making the necessary arrangements for the evacuation of casualties to the aid posts and therefrom. All these doctors have enrolled in the Home Guard as ordinary volunteers in the first instance and have then been posted to the various battalions as medical officers, being accorded the same status as that of a company commander. The senior medical officer, who is attached to zone headquarters and is responsible for the co-ordination of all the medical arrangements and collaboration with the military and civil authorities for the evacuation of casualties and other matters, is accorded the same status as a battalion commander. He attends all the zone headquarter conferences so that he can keep *au fait* with all that is going on and can give advice on all medical matters.

It is only by a scheme such as the above that casualties in the Home Guard can be effectively dealt with, and it seems extraordinary that this has not yet been apparently recognized and it has been left to individual Home Guard units to make their own medical arrangements without any help or co-ordination or even recognition of medical officers as such.—I am, etc.,

W. F. T. HAULTAIN,
Jan 27. Senior M.O., Edinburgh Zone, Home Guard.

The Scottish Ploughman's Dietary

SIR,—In the *Journal* of January 11 (p. 63) I mentioned Robert Burns's diet—that of the Scottish ploughman—as a matter of interest merely, not as illustrative of what the diet could do! It would be absurd to measure the value of the particular diet by the years of Burns's life (which, after all, is to be reckoned by what he was and achieved rather than by its length in years).

At the same time, it is known that, although Burns spent his life in hard toil and striving against poverty with its attendant evils, he did not suffer at any time from wrong or insufficient feeding. Energetic he was and of vigorous constitution, being of athletic build and powerful intellect. He was, however, always badly housed, and seemed compelled to live his short life in an environment bad in every respect. It was such adverse influence, along with occasional imprudent and indiscreet conduct—perhaps all too usual in those days—that predisposed him to an early death. Perhaps, too, Burns had to misguide him certain harmful peculiarities of temperament understandable in men of surpassing genius and brilliance, interested in everything and everybody but themselves and their own health and interests. At the last he developed a protracted illness which, from the clinical course it took, can only have been caused by a subacute infective endocarditis, not "rheumatism" or alcoholism, as has so often been said.

But, apart from all this, I believe that Dr. M. Newfield (January 18, p. 101) will agree with me that, if somewhat unappetizing, the ploughman's diet of oatmeal, broths in quantity, potatoes, milk, and the occasional herring, should constitute a sound basic diet for hungry days.—I am, etc.,

Bournemouth, Jan. 19. S. WATSON SMITH.

Perspiration and Flannel Clothing

SIR,—If Mr. R. Kennon (January 25, p. 137) will try the experiment of the flannel and the thermometer he will find *it does not work. The temperature remains obstinately* at 98.4°.—I am, etc.,

London, W.1, Jan. 31. C. K. VARTAN.

The Services

DEATHS IN THE SERVICES

Major-General Sir GEORGE BRADSHAW STANISTREET, K.B.E., C.B., C.M.G., late R.A.M.C., died at Bournemouth on January 26, aged 74. He was born on May 13, 1866, at Malahide, County Dublin, the son of Dr. Richard Stanistreet, and educated at Windermere College and at Trinity College, Dublin, where he graduated M.B., B.Ch., and B.A.O. in 1889, after taking the B.A. in 1887. He entered the Army as Surgeon Captain on July 28, 1891, became Lieutenant-Colonel on September 13, 1913, Colonel on December 26, 1917, Major-General in 1918, and retired on September 16, 1922. He served on the North-West Frontier of India in 1897–8, in the Tirah campaign, receiving the Frontier medal with two clasps, and throughout the war of 1914–18, when he filled the posts of Deputy Assistant Director-General, A.M.S., in 1913–17, Assistant Director-General in 1917–18, and Deputy Director-General in 1918–22. He received the C.M.G. in 1917, the C.B. in 1918, and the K.B.E. in 1922. He had been a member of the British Medical Association for over fifty years.

Colonel CHARLES JAMES BAMBER, M.V.O., I.M.S. (ret.), died at Downpatrick on January 9, aged 86. He was born at Chittagong on July 14, 1855, the son of Mr. Henry Bamber, and was educated at Bedford Grammar School and at St. Bartholomew's Hospital, taking the M.R.C.S., L.R.C.P. in 1878 and the Cambridge D.P.H. in 1892. Entering the I.M.S. as surgeon in 1878, he became colonel in 1910 and retired in 1915. Most of his service was spent in the Punjab in civil employ, which he entered in 1887. He held various civil surgeoncies, including the important one of Rawalpindi, 1893–8, before he was appointed sanitary commissioner to the Punjab Government in 1900, a post he held until 1910. From 1910 to 1915 he was Inspector-General of Civil Hospitals in the Punjab, and held that post until his retirement. He was administrative medical and sanitary officer, Delhi Durbar, 1902–3 (medal), administrative medical and sanitary officer, Coronation Durbar, 1911 (medal), and a member of the Coronation Durbar Committee. He served on the North-West Frontier of India in the Mahsud Waziri campaign of 1881, in Burma in 1886–7 (medal and clasp), and on the North-West Frontier, Malakand, 1897 (medal); he received the M.V.O. in 1911. Colonel Bamber was the author of a work on *The Plants of the Punjab*, 1917. He had been a member of the British Medical Association for thirty-one years. He leaves a widow.

Obituary

PROF. K. F. WENCKEBACH, M.D.
Hon. F.R.C.P.

We much regret to learn of the death of Dr. Karel Frederik Wenckebach, emeritus professor of medicine in the University of Vienna, whose name as a cardiologist is honoured throughout the world. He came of Dutch parentage and was born at The Hague on March 24, 1864. After studying at the University of Utrecht he graduated M.D., and was appointed in 1888 assistant in the Institute of Zoology, and afterwards in the Department of Pathology and Normal Anatomy. In 1901 he was elected professor of internal medicine at Gröningen, and from 1911 to 1914 held the same post at the University of Strasbourg. He was then called to the chair of medicine at Vienna, and was made emeritus professor in 1929. Throughout those years Wenckebach identified himself with progress in the study, pathological and clinical, of diseases of the heart and circulatory system, publishing many important contributions to cardiological knowledge between 1901 and 1932. For some years he edited jointly with Drs. Falta and Jagic the *Wiener Archiv für innere Medizin*.

Prof. Wenckebach, apart from his scientific and professional eminence, was a man of personal charm. He spoke English fluently and felt genuine affection for this country, where he had many friends. He was an Honorary Fellow of the Royal College of Physicians and of the Royal Society of Medicine, and a Foreign Corresponding Member of the British Medical Association.

Sir THOMAS LEWIS writes:

Many of us in this country will hear with great regret of the death of Prof. Wenckebach, realizing that a chief link with a period of work of extraordinary productivity has been broken. For Wenckebach was one of that brilliant group, which included Cushny, Mackenzie, Einthoven, who simultaneously engaged, intensively and often in collaboration, in studying irregular action of the heart in man. When as a young man I first met Wenckebach it was at Gröningen, where he then held the chair of medicine. He had already reached fame by his independent analysis of cardiac irregularities, using the radial pulse only; this work, published as a whole in his first book, *Die Arhythmie*, in 1903, was a brilliant achievement and the foundation of much that followed. He continued for many years to publish important papers and to stimulate thought and work in this same field, in which he will always be recognized as having been a pioneer. In later years, by publishing an instance in which quinine stopped attacks of auricular fibrillation, he made a first observation that led quickly to the successful use of quinidine for chronic fibrillation. His work upon beriberi heart, undertaken in post-war years in the Dutch East Indies, again broke fresh ground and must be regarded as of high importance.

There are those of us who will recognize not only that a leader, but that an old friend, has passed away. "Venky," as he loved to be called by his intimates, was a genial, good-hearted fellow, full of enthusiasm for work, inspiring to others, and a great teacher of students; we remember how his work carried him from Holland to Germany and then to Austria, and how, unhappily, two war periods came to separate him from his British friends. But neither one nor the other could dim our affection or admiration for this great Dutchman.

SIR WILLIAM HORROCKS, K.C.M.G., C.B.

Colonel, late R.A.M.C.

Sir William Heaton Horrocks died on January 26 at Walton-on-Thames, aged 81. He was born at Little Bolton, Lancashire, on August 25, 1859, and educated at Owen's College, Manchester. He graduated as B.Sc. in 1878 and as M.B. with honours in 1883 at London University, also taking the B.Sc. Victoria University in 1882, the M.R.C.S. in 1882, and the D.P.H. of the London Colleges in 1901. Entering the R.A.M.C. as surgeon on February 3, 1887, he became lieut.-colonel on May 19, 1911, brevet colonel on May 20, 1911, colonel in the long war promotion list of March 1, 1915, and retired at the end of 1917. Throughout his service he was employed almost entirely on scientific work, in which he made a great name. In 1897 he was appointed assistant professor of military hygiene at the Army Medical School, Netley, and continued to hold that post at the Royal Army Medical College, Millbank, till 1903. He was medical officer and sanitary officer at Gibraltar from 1903 to 1909. In 1904–6 he served as a member of the Royal Society's commission on Malta fever, or Mediterranean fever, in which capacity he did his best work and made his name. Sir David Bruce had previously proved that the cause of this fever was a microbe, *Micrococcus melitensis,* but it was Horrocks who discovered that the disease was transmitted by goat's milk, and could be avoided by not using such milk.



In January, 1915, Colonel Horrocks was awarded the Chadwick gold medal of the Royal Society of Arts for the best work done in promoting the health of the men in the Army. When the war began in 1914 he was appointed chairman of the Anti-gas Committee to devise methods for counteracting the use by the enemy of poison gases. In 1914 he was appointed Honorary Surgeon to the King, and received the C.B. in 1917 and the K.C.M.G. in 1918. He was the author of *The Bacteriological Examination of Water,* for long the standard work on this subject, and along with Colonel Firth edited the second edition of Notter and Firth's (originally Parkes) *Theory and Practice of Hygiene.* He also edited the *Journal of the R.A.M.C.* till quite recently, and wrote many scientific treatises and articles, the list of which fills half a page in Johnston's *Roll of the R.A.M.C.* In 1894 he married Minna, the daughter of the Rev. J. C. Moore, of Connor, County Antrim; she died in 1921, leaving one son and one daughter.

Brigadier E. M. COWELL writes:

The name of Sir William Heaton Horrocks will be for ever perpetuated in the Army because of the contribution he made to the improvement of the hygiene of the Army by the introduction of the "Case, water-testing—sterilization," or, as he loved to call it, "My little box." Sir William was a great man with a wide outlook and an untiring devotion to detail. He retained his interest in the *Journal of the R.A.M.C.* until the end, being entirely responsible for the editing of all the articles since the beginning of the war. The writer had been privileged to see something of Sir William in the past few months. He was a little, frail, sweet-tempered gentleman, old in years but young in mind, living in the country but in touch with the office of his beloved journal at the War Office. He felt out of the world, and said, "Everyone has forgotten me." When told that his "little box" was in constant use and that the benefit of his discovery would last for ever, he was happy. Sir William has achieved the happiest of endings, dying "in harness."

[The photograph reproduced is by Russell, London.]

SIR PENDRILL VARRIER-JONES, M.A., F.R.C.P.

Founder and Director of the Papworth Village Settlement

The premature and sudden death of Sir Pendrill C. Varrier-Jones at Papworth on January 30 deprives the profession of a great authority whose work, though now widely recognized, he did not regard as nearly complete. Endowed with great power of work, enthusiasm, and sane imagination, he had a genius for organization.

Born on February 24, 1883, as the only son of the late Dr. C. Morgan Jones, he was educated at Epsom College, St. John's College, Cambridge (foundation scholar), where he was placed in the first class of the Natural Sciences Tripos, 1905, Part I, and in the second class of Part II in the following year, and at St. Bartholomew's Hospital, where he was house-physician. Then as a research worker at Cambridge, dealing with the temperature of patients throughout the twenty-four hours, he temporarily acted as tuberculosis officer for Cambridgeshire, and then realized the farce of giving advice, such as light work in the open air and a good diet, to a man with pulmonary tuberculosis who could not secure these benefits. Accordingly in 1915 with the encouragement, and their collaboration in published papers, of Sir Clifford Allbutt and Sir German Sims Woodhead, he opened at Bourn, at first with one patient, the Cambridgeshire Tuberculosis Colony, which in 1918, with twenty-five patients, moved to Papworth Hall, the colony of which now contains 1,200 residents in hospitals, hostels, and cottages, 500 being in hospitals. Here for twenty-two years there followed remarkable and constant additions: a surgical hospital and unit for tuberculous disease, other hospital blocks, a home for tuberculous nurses, research laboratories with a *Bulletin,* and especially the fine workshops where workers with arrested lesions work under medical care. He was a good judge of his assistants, trusted them, and attached them to himself for many years. In a letter written on January 15 last Varrier-Jones said that the sales of the Papworth industries exceeded those of the record year 1939. He was always on the watch for advances and new lines of activity, and was looking forward to the establishment of a school of tuberculosis at Papworth. He did much to help similar colonies for subnormal men —such as Enham (now allied with Papworth), Preston Hall treatment and training colony for tuberculous ex-Service men, near Maidstone, Peamount village settlement, near Dublin—and had much at heart the wide extension of this method of dealing with tuberculosis.

At the time of his death he reached the summit of his career, and had received the recognition he so thoroughly deserved. He was knighted in 1931; at the Royal College of Physicians of London he was elected a Fellow in 1934, gave the Mitchell Lecture on the subject of village settlements for the tuberculous in 1927, and was awarded the Weber-Parkes prize for tuberculosis in 1939. Medical men from distant parts constantly visited Papworth, and Varrier-Jones would have been the Government's representative at the meeting in Berlin arranged for September, 1939, of the International Union against Tuberculosis. The Duke of Kent has been president of Papworth since 1935, and six members of the Royal Family are its patrons.

HUMPHRY ROLLESTON.

It will be of interest to readers to know that Varrier-Jones at the time of his death was actively engaged in developing a scheme to add teaching to his other work. He proposed to hold a course of instruction in the diagnosis and treatment of

pulmonary and other forms of tuberculosis at Papworth Village Settlement. The course would include instruction in clinical methods, radiology, and chest surgery, and special attention would be given to the sociological and economic aspects of the disease.

Sir ARTHUR MACNALTY writes:

It is with great sorrow that I hear of the death of my friend, Pendrill Varrier-Jones. It is hard to realize that a man of such genius, courage, and enthusiasm for the welfare of the consumptive has left us, harder still to realize what Papworth can be without him, for he was in a very special sense the personification of the great institution which he founded. But Papworth is much more than an institution; it embodies the secret of successful treatment of tuberculosis. Varrier-Jones, with the rare insight of the pioneer, saw tuberculosis as a social and economic problem as well as a medical one, and at once began to seek a solution. The axioms on which his work was founded were simple. His experience as tuberculosis officer in Cambridge showed him that the consumptive worker was in the majority of cases a damaged life, that through sanatorium treatment he frequently obtained arrest of his disease, but when exposed to the strain and stress of competition with healthy labour he broke down and his last state was worse than the first. He became unemployed, a charge upon the State, and, what was worst of all, he lost hope. As Sir Clifford Allbutt said, the work of Varrier-Jones was to restore that hope. The consumptive at Papworth remains under medical supervision. He passes through the stages of hospital and sanatorium treatment, and is provided with occupation suited to his state of health. When afebrile he works at a trade, for which he receives trade union rate of wages. He resides in a hostel or, if married, in the village settlement with his wife and family. If at any time his health relapses he is sure of prompt and expert treatment in the institution.

"Who hath despised the day of small things?" Varrier-Jones started his village settlement at Bourn in Cambridgeshire in 1915, with one patient in a shelter. He saw this nucleus develop into a great institution at Papworth with 500 acres of land, administrative blocks, hospital blocks provided with every facility for modern treatment, a large sanatorium section, laboratories and research institute, a village settlement of a hundred cottages and more, hostels for men and women, and factories equipped with labour-saving machinery, with annual sales amounting to well over £88,000 per annum.

Sir Robert Morant did much to help on the scheme in its early days, and the Ministry of Health made monetary grants. In 1919–20 Varrier-Jones, Dr. Nathan Raw, M.P., and I constituted a small departmental committee which was set up to explore the possibilities of establishing village settlements for tuberculous ex-Service men throughout England and Wales. We paid many visits to possible sites and conferred with a number of local authorities. In the end it was considered better to develop existing settlements at Papworth and Preston Hall than to provide new organizations. Papworth alone did not occupy Varrier-Jones's boundless energies. He was honorary medical director of the Enham Village Centre for ex-Service men, replanned the Preston Hall Village Settlement at the request of the British Legion, and advised on the establishment of a village settlement at Peamount near Dublin. A firm and kindly administrator, he had a profound knowledge of men and business affairs, which greatly contributed towards the success of Papworth. He was, indeed, a "captain of industry" who employed his gifts solely for the benefit of the consumptive worker. I have never known a man of greater single purpose. He devoted his rare holidays for the most part to visits abroad in order to study foreign problems of tuberculosis. He was ever planning new departures to meet the existing situation. Only a few days ago I received a letter from him outlining a scheme for undergraduate instruction in tuberculosis. "If necessary I shall start with one student," he wrote characteristically.

He was a generous host and a witty companion, with a keen sense of humour. Those who considered him intolerant misunderstood him. It was zeal to reach his goal that made him press on and sometimes show impatience. Varrier-Jones's place in the history and development of anti-tuberculosis work is a very high one, and mankind has lost one of its benefactors.

F. TEMPLE GREY, M.B., CH.M., M.R.C.P.

We regret to announce the death of Dr. F. Temple Grey, barrister-at-law, which took place in London on January 23. He had made a place for himself in the two professions of law and medicine. He was as much at home in the Grotius Society wrestling with the intricacies of international law as he was in the pathological department of the hospital which he dearly loved, the Princess Elizabeth Hospital for Children at Shadwell. His death, at the age of 54, following a long illness, has cut short a career of great promise.

Francis Temple Grey was born in London in 1886, the son of an officer in the British Army in India. He was educated privately, and afterwards entered Wadham College, Oxford, at which university he took his M.A. Later he went to Australia, and it was there in 1914, at the University of Sydney, that he qualified in medicine. For a time he served as house-surgeon and resident pathologist at the Sydney Hospital, afterwards becoming a surgeon in the Royal Navy during the last war, when he was decorated for gallantry on service in the Dardanelles. Returning to this country after the war, he was for six years pathologist to the Ministry of Pensions. Gradually he built up a reputation as an authority on certain branches of medical jurisprudence, and was an expert witness in several criminal trials in which the question of death by poisoning was the issue. He was deputy coroner for the Eastern Division of Middlesex, also honorary pathologist to the East End Maternity Hospital. In 1924 he was "called" at Lincoln's Inn. His outstanding work on the legal side was his editorship of the fifth edition of Pitt Cobbett's *Cases in International Law*.

A man of frail physique—though that did not prevent his participation in strenuous sports like swimming and yachting—Dr. Grey was a man of acute intellect and considerable gifts of teaching and exposition. The smaller the class to which he lectured at the Princess Elizabeth Hospital, and the scantier the attendance at small medical societies which he addressed in and around London, the more he seemed to expand. His quick mind, his clear diction, and his illustrations from his growing experience of unusual medico-legal cases made his informal lectures both fascinating and instructive. He was a quiet but effective worker for the British Medical Association, which he had first joined in Australia in 1915. On returning from service after the war he threw himself into the activities of the Marylebone Division, of which he was honorary secretary for some years, and chairman in 1937–8. He also served as the representative of his Division at the Annual Representative Meetings from 1927 to 1936, with one or two exceptions, and his interventions in debate, which were generally on medico-legal or ethical subjects, were always worth listening to, especially when he took an unpopular view, as he not infrequently did. He was a member of some headquarters committees, notably the Committee on Lunacy Law and Mental Disorder from 1928 to 1930, the Science Committee from 1929 to 1931, and the Library Subcommittee from 1929 until his death. He was the originator of an improved technique for blood transfusion. His articles in the medical journals were largely on the subject of diphtheria, on the bacteriological aspects of which he had specialized. The articles on "Medical Jurisprudence," "Legal Aspects of Insanity," and "Capital Punishment" in the current *Encyclopaedia Britannica* were also from his pen.

W. CECIL BOSANQUET, M.D., F.R.C.P.

Consulting Physician to Charing Cross and the Brompton Hospitals

Dr. William Cecil Bosanquet, who died in London on January 24 at the age of 74, was well known as a general physician and pathologist and for his interest in tuberculosis and other diseases of the chest.

He was born at Whiligh, Sussex, on October 12, 1866, son of Admiral G. S. Bosanquet, and from Eton, where he was a King's Scholar, he went up to New College, Oxford, taking a first class in Classical Moderations in

1887 and a first class in *Lit. Hum.* in 1889. From 1891 to 1897 he held a Fellowship of New College, during which time he studied medicine at Charing Cross Hospital. He took the M.A. degree at Oxford in 1892 and the M.B. and M.D. in 1897, and was elected F.R.C.P. in 1904. At Charing Cross Cecil Bosanquet was in turn pathologist, assistant physician, and full physician, and he was for many years physician to the Brompton Hospital for Consumption. He had also been physician to out-patients at the Victoria Hospital for Children, Chelsea, and physician to the London Lock Hospital. During the last war he was attached for two years to the *à la suite* staff of the 4th London General Hospital with the rank of major R.A.M.C.T., and thereafter served with the 44th General Hospital in India, and was consultant physician to the North-West Frontier Force in 1919. At the Royal College of Physicians he was examiner in 1923–7, a member of Council 1927–9, and then Censor for a year. At the Annual Meeting of the British Medical Association in 1904 at Oxford he was honorary secretary of the Section of Medicine.

Bosanquet wrote jointly with Prof. Eyre a small work on serums, vaccines, and toxins in treatment and diagnosis which reached a third edition in 1916, and collaborated with Mr. H. S. Clogg in a publication on the stomach, intestines, and pancreas. He also edited the thirteenth edition of *Green's Pathology and Morbid Anatomy*. In 1937 he published an interesting book under the title *Meditatio Medici: A Doctor's Philosophy of Life*; it bore the marks of wide reading and much reflection, well phrased in scholarly English.

Dr. MAURICE DAVIDSON writes:

It is difficult to do justice to the memory of Bosanquet's personality. His private life was remote from his professional activities, and few, if any, of his medical friends were permitted really to see behind the veil. His refinement of intellect and exquisite scholarship were apparent to all who associated with him in hospital; these were, perhaps, the most conspicuous elements in the personal charm which endeared him to his colleagues, but behind him and beyond them lay something rarer—a real unselfishness and a deep consideration for the feelings of others. It is, perhaps, in moments of physical weakness that such qualities are sometimes seen to stand out in clear relief. During the last few weeks of a distressing illness nothing was more in evidence than Bosanquet's innate gentleness and courtesy, which seemed to show themselves more and more as his bodily strength grew weaker. Indifferent to his own feelings and to the consciousness of failing powers, he thought only of those around him and of how he could still be to them the kindly and gracious host that he always was. The writer has occasion to recall with gratitude the kindness and attention received at Bosanquet's hands during a long illness some years ago, and in memory of this to mourn the passing of a great gentleman, whom he was also privileged to look on as a personal friend.

The death occurred at his home, St. Anns, Carlisle, on January 13, of Dr. GEORGE DUNCAN LOGAN, who for over forty years was in practice at Ecclefechan, Dumfriesshire. He was born of Border farming stock at Balmacara in the West Highlands in 1859, and was educated at George Watson's College, Edinburgh. Keen on athletics, he boxed and played football, and his name appears in about a third of the entries for the events at the first school sports of that institution. He then entered Edinburgh University and graduated M.B., C.M. in 1882, proceeding M.D. in 1915. After acting as house-physician and house-surgeon at the Royal Northern Infirmary, Inverness, and gaining experience in psychiatry at Derby County Asylum and the Murray Royal Institution at Perth, he became an assistant in practice in Cumberland and later went into practice on his own account in Ecclefechan. He had been a member of the British Medical Association for thirty-nine years. T. McL. G. writes: A man of exceptional ability and outstanding personal qualities, Logan's fame spread far beyond the borders of his village, and his practice gradually became one of the largest in the country. He became known and respected by consultants in Edinburgh, London, and Glasgow, and had many interesting tales of the giants of the medical past. As a student he had "sprayed" for Lister, and assisted at the first operation for removal of an ovarian cyst done in Edinburgh. The patient was a Highland girl whose only language was Gaelic, which was that of Logan's childhood, and he acted as interpreter. He retired from practice in 1925, and after a year or two in other places he bought St. Anns, with its beautiful gardens, in which he spent many happy hours at his favourite hobby, gardening, at which he was very expert and of which his knowledge was encyclopaedic. He was widely read in other subjects beside his own, and excelled at fishing and shooting. In the days when night journeys were done in open horse-drawn vehicles he studied the stars, and knew a vast amount of astronomy. By day he studied birds, and had many wild birds sufficiently tamed to eat from his hand and his pocket. An interesting conversationalist and a charming host, he made his home a place "that liked to be visited." Three years ago he celebrated his golden wedding. He is survived by his widow, and by a granddaughter and great-grandson who are in South America.

Dr. JOHN DUDGEON GILES, O.B.E., medical superintendent of Hope Hospital, Salford, was killed by enemy action in December, 1940. He was the son of the late Rev. Alexander Giles of Ashkirk, Selkirkshire, and was educated at the University of Edinburgh, where he graduated M.B., Ch.B. in 1903. He proceeded M.D. in 1909, being commended for his thesis. He also studied in London at King's College and Middlesex Hospitals. After graduating he served as assistant medical superintendent of Bermondsey Parish Infirmary, as resident medical officer of Middlesbrough Union Hospital, and as medical superintendent of South Shields Union Infirmary. At Salford, in addition to being in charge of the Hope Hospital, he was medical officer of Salford Old People's Homes and consulting medical officer to the Salford Municipal Maternity and Babies' Hospital. He had been a member of the British Medical Association for twenty years.

Dr. JAMES THORESBY JONES, J.P., who died at Antrim Mansions, London, W., on January 20, aged 90, had been a member of the British Medical Association for fifty-three years. A student of University College and Hospital, London, he qualified as M.R.C.S.Eng. in 1877, obtained the L.R.C.P.Ed. soon afterwards, and took the M.D. degree of Durham University in 1894. As a young man he served as house-surgeon at University College Hospital and at St. Bartholomew's Hospital, Rochester. Settling in practice in London he became surgeon to the Western General Dispensary and to the Post Office and Board of Education, and district surgeon under the L.C.C. and the Metropolitan Water Board; he was also for many years physician to the School for Mothers and Child Welfare at Paddington. Dr. Thoresby Jones was a regular attendant at the meetings of the Medical Society of London, and had held office as president of the Harveian Society.

Dr. THOMAS VINCENT DICKINSON, a former Master of the Society of Apothecaries, died in London on January 21, aged 83. The son of a medical man, Dr. Dickinson was a medical student at King's College, London, and at St. George's Hospital, and qualified M.R.C.S. in 1879 and L.R.C.P. in 1880. His qualification by no means ended his student career, for within the next year he had taken the London M.B., with honours in physiology and histology, and in the following year the M.D. His specialty was the diseases of women and children, on which he wrote a number of papers in the medical journals. Early in his career he became attached to the Chelsea Hospital for Women, and served that institution as a member of its visiting staff for many years. From 1892 until 1897 he was an examiner in obstetrical medicine for the Society of Apothecaries, and thus began a close association with that body which culminated in his election as Master for 1925–6. During the war of 1914–18 Vincent Dickinson, who received special mention for his services and was made a Commander of the Crown of Italy, served on the Italian Government Medical Commission from the time of Italy's entrance into that war on the side of the Allies until the

armistice. His services were highly valued by pre-Fascist Italy, and to the cause of Anglo-Italian co-operation Dr. Dickinson continued to devote himself with great enthusiasm. He was, first, physician, and afterwards consulting physician, to the Italian Hospital in London, and he was the founder of the Anglo-Italian Literary Society. He also gained the medal of the Royal Society of Arts for Italian. After the end of the last war he served for fifteen years, until 1933, as chairman of medical boards under the Ministry of Pensions. He was also medical adviser to the Admiralty Welfare Department. To the end of his life he held the post of visiting apothecary to his old hospital, St. George's. His contributions to medical society life were mostly made to the Chelsea Clinical Society, of which he was at one time president, and to the History of Medicine Section of the Royal Society of Medicine, of which he was a vice-president.

Dr. JOHN JAMES ADAMS of Ashville, Antrim, has died in his ninety-second year. He was appointed coroner for the Antrim district in 1886, and on completion of fifty years' coronership a number of his friends presented him with his portrait in oils. Dr. Adams was educated at Queen's College, Belfast, graduating M.D. of the Royal University of Ireland in 1875, and M.Ch. in 1877. Respected as a man of sterling character and a fearless critic, he was also noted for his practical benevolence; the town and district have many memorials of his public spirit and generosity. At an inquest in the board room of Antrim Union the deputy coroner, Dr. Hall Stewart of Randalstown, paid a high tribute to the work and personality of Dr. Adams, saying that he was beloved not only by his professional colleagues but also by that wide circle of patients and friends with whom he came into contact. Dr. Adams was one of the outstanding figures in the public, social, and charitable life of Northern Ireland, and they were the poorer because of his passing. As a coroner he was most acceptable to everyone concerned, for he was genial, approachable, and thoroughly human.

Dr. DANIEL CHRISTOPHER MULLALLY, who died with tragic suddenness on January 27 from pulmonary embolism following an operation, was only 26 years old. He graduated M.B. of Queen's University, Belfast, in 1936, and last year, in spite of the handicap of ill-health, passed the examinations for M.D. and M.R.C.P.Lond. During 1939 he was house-physician in the National Temperance Hospital, and subsequently blood transfusion officer there, under the E.M.S. His work (writes J. B. Y.) was of the best. He had great gifts and qualities of mind and character which seemed to mark him out for future distinction in the profession. Medicine can ill afford to lose one of such promise, and his early death is indeed a tragedy.

Universities and Colleges

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

DIPLOMA IN CLINICAL PATHOLOGY.—G. Prasad, J. H. Stritch, Freida Young.

BRITISH POSTGRADUATE MEDICAL SCHOOL

ACADEMIC POSTGRADUATE DIPLOMA IN CLINICAL PATHOLOGY.—A. R. Aidin, J. W. Clegg, J. T. Quinlan.

Diploma in Psychological Medicine

The last date for obtaining the entry form for the examination for the postgraduate diploma in psychological medicine, March–April, 1941, is February 24; entry closes on March 1; and the examination begins on March 25 (Part A) and April 8 (Part B). Entry forms may be obtained from the University Extension Registrar, University of London, Royal Holloway College, Englefield Green, Surrey.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At the quarterly Comitia of the Royal College of Physicians of London, held on January 30, with the President, Sir Robert Hutchison, in the chair, the following representatives of the College were elected: Sir Charles Wilson, Dr. H. L. Tidy, Prof. J. A. Ryle, and Prof. H. P. Himsworth on the British Medical Association Medical Planning Commission; Dr. A. Feiling on the Council of the Queen's Institute of District Nursing; Dr. A. S. Barnes on the Court of Governors of the University of Birmingham; Dr. P. Hamill on the Advisory Committee of the Ministry of Health to compile a War Emergency Formulary.

Membership

The following candidates, having satisfied the Censors' Board, were admitted Members of the College:

James Brown Arthur, M.B.Ed., John Donald Bail, M.B.Lond., Thomas Edward Dowrick Beavan, M.B.Birm., Aaron Jacob Bernfield, M.B.Lond., Stanford Cade, F.R.C.S., William Edward Clarke, M.B.Lond., Constance Elaine Field, M.D.Lond., Michael Oliver John Gibson, M.B.Camb., Alfred Gordon Heppleston, M.B.Manch., Hugh Martin James, M.B.Camb., Raymond Benedict Magill, M.B.Belf., Robert Hereward Mole, M.B.Oxf., Narayan Vasudeo Nene, M.B.Bomb., Elizabeth Herman Rosenberg, M.B.Lond., Gerard Sanderson, M.B.Liverp., Shital Prasad Sinha, M.B.Patna, Geoffrey Reginald Steed, M.D.Lond., Clive Henry Critchett Upjohn, M.B.Camb., Charles Keith John Vautier, M.B.New Zeal., Celia Kathleen Westropp, M.B.Oxf.

Licences and Diplomas

Licences to practise physic were granted to the following 177 candidates (including 22 women) who had passed the Final Examinations in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the necessary by-laws:

J. P. Adlam, B. Alexander, A. J. C. Allen, G. J. Amiel, A. W. Anderson, C. M. Arango, A. Arnstein, M. W. Arthurton, W. Aspinall, Islay C. Barne, J. Barrow, D. H. Bennett, F. A. Binks, A. Bogdanovitch, C. Brun, J. M. Burbury, C. R. K. Carroll, D. I. Chapman, H. R. Claff, L. Cohen, Brenda Collar, C. W. Coplans, J. A. B. Cotsell, W. R. Cyrlas-Williams, J. H. Dadds, E. B. Dawe, J. Denfield, G. D. Denlow, A. G. Doughty, C. E. Drew, Margaret D. D. Dudley-Brown, C. T. F. Ealand, W. K. Earle, H. H. G. Eastcott, Christine Ecroyd, E. M. Ensor, E. G. Essery, Joan Fitzherbert, B. J. Fowler, A. J. Fraser-Simson, S. M. Frazer, F. Freund, P. D. Gange, O. F. Garar, L. Garland-Collins, A. J. Gaskell, J. E. Gilbert, R. A. Gill, B. M. Girgis, G. Godfrey, A. H. F. Gow, C. N. Grainger, J. C. Gray, J. L. Greaves, Barbara J. Greenwood, C. H. Greer, A. G. Gregory, E. W. Guillaume, J. W. P. Gummer, A. W. Hagger, F. A. H. Hall, Winefride M. Hamilton, G. P. Hartigan, P. L. M. Hartley, M. C. Head, E. H. Hemsted, G. G. Henn, M. Hershman, J. H. Hicks, A. C. Higgett, G. de B. Hinde, J. C. Holman, Emily M. Horsfall, E. W. Hyde, N. N. Iovetz-Tereshchenko, J. D. James, Elizabeth E. Johnson, A. C. V. Jones, H. W. Jones, H. P. Jones, H. O. Jones, R. D. Jordan, H. L. Joyce, H. Kanter, Marie D. Kelleher, R. E. Kelly, E. R. Keyworth, J. H. Kirkham, S. H. Kutar, R. U. F. Kynaston, B. Lewis, D. W. Liddell, Isobelle G. Little, R. R. H. Lovell, N. W. R. Lucas, Silvia C. Lucas, W. C. Lyon, G. E. McFall, W. E. Mahon, J. Manhas, F. R. C. Manning, L. W. C. Massey, T. R. Maurice, Joyce B. M. Mayes, F. B. Meade, V. C. Medvei, Joan S. Millett, A. F. Mohun, R. A. R. Montgomery, J. V. Morris, Madeleine B. Morris, J. H. MacL. Munro, S. Muntarbhorn, T. A. Narayanan, L. P. A. Newborne, D. J. O'Brien, W. O'Brien, C. B. O'Carroll, E. E. Oddie, F. H. Packer, R. H. A. Parker, C. N. Partington, A. J. Patenall, G. H. Pearson, Rosa M. Pigot, L. Portelli, F. T. G. Prunty, S. D. Purcell, H. Reeback, H. N. Reed, P. A. Rees, R. L. Rees, R. E. Renaud, G. K. C. Rettie, R. E. Rewell, Florence C. R. Richardson, Kathleen P. Richardson, M. J. Riddell, E. F. Ridley, R. Robins-Browne, G. K. T. Roche, J. A. J. Sandilands, W. Schey, Isabel B. Schooling, C. M. Shafto, R. G. Sheppard, J. C. Smith, R. J. Stanley, R. B. Stark, T. Sternberg, J. N. Stirling, H. A. W. Stormont, R. J. Stout, F. G. Strong, P. N. Swift, J. M. Swithinbank, M. R. Thompson, D. N. Thornton, R. Tilley, St. J. M. A. Tolhurst, S. Tomback, Eileen D. Trafford, Ruth D. Usher, P. C. van der Westhuizen, A. S. Veeder, J. H. E. Verdon, G. B. R. Walkey, F. J. H. Walters, W. R. Watson, S. D. V. Weller, B. W. Wells, Moyra Welply, H. Whittaker, R. D. Wilkins, R. J. G. Williams, A. R. H. Williamson, J. B. Wyman.

Diplomas were granted, jointly with the Royal College of Surgeons of England, as follows:

DIPLOMA IN PUBLIC HEALTH.—G. P. Charles, Gwendoline M. Edwards, Joan M. Faulkner, S. Leff, I. B. Sen Gupta.

DIPLOMA IN MEDICAL RADIOLOGY.—B. Jolles, J. H. Wilding.

Diplomas in Anaesthetics were granted to the twenty-eight persons whose names were published in the report of the meeting of the Royal College of Surgeons of England in the *Journal* of December 21, 1940 (p. 888), as were the names of the four persons who were granted Diplomas in Laryngology and Otology. Diplomas in Psychological Medicine were granted to the three persons whose names were published in the report of the meeting of the Royal College of Surgeons of England in the *Journal* of January 18 (p. 101).

Medical News

We publish in the *Supplement* this week (p. 15) the tenth list of donations to the Medical War Relief Fund. It reflects once again the practical sympathy of medical men in the British Dominions and Colonies for their colleagues in this country who have suffered loss or deprivation through the war. Medical officers of the Basutoland Government Service who cannot be released for active war service have now added their contributions to the subscriptions and collections which have arrived from Australia, Canada, South Africa, the Gold Coast, and Assam.

The Tavistock Clinic (Institute of Medical Psychology) has arranged a discussion on the shelter problem, to be held at Westfield College, Kidderpore Avenue, N.W.3, on Saturday, February 15, at 2.30 p.m. It will be open to registered medical practitioners free of charge, and those wishing to attend are asked to notify the Educational Secretary at Westfield College.

At a meeting of the Pharmaceutical Society of Great Britain at 17, Bloomsbury Square, W.C., on Wednesday, February 12, at 2.30 p.m., an address entitled "Early English Materia Medica Cabinets in Cambridge" will be given by Mr. E. Saville Peck, M.A., member of council. There are three of these cabinets in Cambridge—namely, Vigani's at Queens' College, Addenbrooke's at St. Catharine's College, and Heberden's at St. John's College—the earliest dating from 1701.

Lord Horder, chairman of the Empire Rheumatism Council, has received from the President, H.R.H. the Duke of Gloucester, a letter acknowledging receipt of the encouraging report for 1940, and conveying his congratulations on the good work of the past year and confident hopes of full success in the future.

The Davyhulme Military Hospital Medical Society held its inaugural meeting at the hospital on Thursday, January 30, when Major R. W. Fairbrother read a paper on cerebrospinal meningitis. The object of the society is to encourage the meeting together of medical men and women in all the Services (including civilian) for the discussion of problems of common interest. Membership is open to any medical man or woman in the area. The next meeting will be held at the hospital on Thursday, February 13, at 3 p.m., when Lieut.-Colonel W. E. Underwood will read a paper on gunshot wounds in the field. Will anyone interested kindly get in touch with the hon. secretary, Major William Brockbank, Military Hospital, Davyhulme, near Manchester.

The Ministry of Health has ordered half a million "germ masks" to be supplied to public air-raid shelters for issue to people as a protection against the spread of epidemic catarrhal diseases by droplet infection. The standard type of mask is made of non-inflammable cellulose acetate film, 5½ in. square, to which is attached a narrow strip of elastic so that the film, placed across the bridge of the nose, is held in position by putting the elastic band over the head. This type, apart from being made for free issue, can be obtained from most chemists' shops for 2d. or 3d. Satisfactory substitutes can be made at home from transparent paper or oiled silk.

An intensive campaign for the education in health matters of people using air-raid shelters as dormitories is already well under way. A supply of two posters for display in surface and in large public shelters is being sent to local authorities by the Ministry of Health, and the Central Council for Health Education, at the Ministry's request, is preparing leaflets and posters which will be available to all local authorities. Some of the Central Council's leaflets, notably that on "Shelter Health," have already been distributed. In a recent circular from the Ministry local authorities are asked to make use of the Central Council's facilities, and to get in touch with them with a view to making appropriate arrangements. They are also informed that in allocating the two posters now being sent to them up to 50% of the sites in shelters should be used for (1) other Ministry posters relating to help after air-raid damage or to advice about rest centres, and (2) posters from the Central Council.

Medical Notes in Parliament

Science and Government

At the annual meeting of the Parliamentary and Scientific Committee at the House of Commons on January 28 the Earl of Dudley was elected president for 1941 and Prof. A. V. Hill a vice-president. In an address to the committee Prof. A. V. Hill said safeguards must be maintained to ensure the independence and integrity of science in the increased volume of State-aided research. He would like to see introduced into each Department or organization some Scientific Advisory Council similar to that now working so well in the Ministry of Supply. There should be regular interchange of personnel between Government research establishments, organizations, universities, and other independent institutions in which research was done. Some kind of "family doctor" was needed to watch over the scientific health of Government Departments, who would call in consultants when and where needed. One of the great tasks lying before scientific people after the war would be to rebuild on a firmer foundation the international scientific organizations. With regard to international co-operation, Prof. Hill referred to the difficulties which had arisen in the past through political considerations being introduced into what should have been purely scientific gatherings. After the war we should rely so far as possible on the help and advice of our American scientific friends.

Diphtheria Inoculation.—Miss HORSBRUGH told Mr. Brooke on January 22 that available information suggested that the appeal for parents to have their children inoculated against diphtheria had, in many areas, met with a good response from parents and local authorities. It was too early to assess the measure of success achieved. She promised Sir Stanley Reed that she would make inquiries if she were sent details of an organization which, according to Sir Stanley, was trying to persuade parents not to have their children inoculated.

Chronic Sick in London Hospitals.—Mr. MACDONALD told Mr. George Strauss on January 23 that the number of old and chronically sick cases in the London hospitals had been very much reduced, and was less than half the normal. Many of those who remained had expressed unwillingness to go. Top floors and other particularly exposed parts of the hospitals were not in use, and casualties had been few. It was not practicable at the present time for all the remaining chronic sick to be moved out in view of the heavy calls made on the outer beds by acute sick, air-raid casualties, and Service cases.

Scabies.—Sir ALFRED KNOX suggested on January 23 the making of regulations under the Public Health Act, 1936, to provide for the notification of scabies. Mr. MACDONALD answered that scabies was a skin condition produced by the burrowing into the skin of a parasite. It was not, therefore, an infectious disease in the accepted sense. Many cases never came under the notice of a doctor. Compulsory notification was not the most suitable method of dealing with the problem. Sir ALFRED KNOX stated that since evacuation began one of the boroughs in the Wycombe division of Buckinghamshire had had 150 cases.

R.A.M.C. and Treatment of Air-raid Casualties.—Co-operation of the R.A.M.C. in the work of treating casualties in bombing raids has been agreed in principle and has in considerable measure been put into force, particularly in the case of specialist officers. In some cases R.A.M.C. orderlies have assisted in the initial treatment of civilian casualties. Captain Margesson and Mr. MacDonald are continually reviewing the position with a view to increasing the co-operation between military and civilian medical officers.

Alternatives for Imported Drugs.—Mr. MACDONALD told Sir Francis Fremantle on January 30 that a Regulation had been made to limit the prescription by medical practitioners of non-essential imported drugs and the sale of such drugs as ingredients in imported medicines. Suitable alternative materials would be provided for prescription. The Regulation would be published in a few days. He intended to give advice to general practitioners in this matter, details of which would appear in the medical journals.

Calcium Deficiency.—Major LLOYD GEORGE, in a reply to Sir Ernest Graham-Little on January 30, said there were reasons for distrusting the conclusions by the Liverpool Institute of Research that there was no general deficiency of calcium in the people's diet and danger in increasing the calcium content of bread. The results of this research were under consideration on behalf of the Medical Research Council. The Ministry of Food still proposed to add calcium to the reinforced loaf.

EPIDEMIOLOGICAL NOTES

Influenza in Week Ending January 25

The increase of influenza deaths from 99 to 120 (see tables below) is not startling. Taking, however, a figure of about 100 as evidence of the beginning of prevalence, great or small, we have had two instances of severe epidemics in which the first pair were virtually the same as this—namely, in 1929, when 99 was followed by 122 and the eventual maximum was 2,183; and in 1932–3, when 85 was followed by 120 and the eventual maximum was 1,934. On the other hand, after 94 last year the next figure was 158, but the maximum was only 629. It may be added that certain more recent information for London supplied to the Ministry of Health is somewhat reassuring, as it shows that there has been no further increase in the numbers of admissions of influenza, bronchitis, and pneumonia to hospital. The conclusion is that there is no immediate sign of danger, but we cannot yet give an optimistic forecast. The age distribution of the influenza deaths is of the normal inter-pandemic type.

Total of Influenza Deaths and Deaths in Age Groups in 126 Great Towns for Week Ending January 25

All Ages	A Under 1 year	B 1–5	C 5–15	D 15–25	E 25–35	F 35–45	G 45–55	H 55–65	I 65–75	J 75 and over
120	3	—	3	6	5	8	14	22	23	36

Regional Totals of Influenza Deaths for Week Ending January 25

South-Eastern Area: Greater London 40, Rest of S.E. 13	53	Midland Area	20
		Eastern Area	1
		South-Western Area	4
Northern Area	46	Wales and Monmouthshire	2
Total for 126 Great Towns, including the Outer Ring	126		

Cerebrospinal Fever

Although the number of notifications of cerebrospinal fever increased in the whole country, the number of administrative areas notifying cases fell from forty-four to forty-one, and, with the exception of the West Riding of Yorks, where cases rose from 5 to 26, virtually the same areas were affected—namely: Lancaster 30 (Liverpool 10, Manchester 4, Bacup 2, Barrow-in-Furness, Blackpool, Bolton, Bootle, Burnley, Bury, Preston, Ashton-under-Lyne, Crosby, Fleetwood, Lancaster, Morecambe and Heysham, Huyton with Roby U.D., and Whiston R.D., 1 each); Yorks, West Riding, 26 (Sheffield, 9, Leeds 8, Bradford 2); London 14; Warwick 14 (Birmingham 11, Coventry, Leamington, and Rugby, 1 each); Gloucester 13 (Bristol 5, Gloucester 4, Cirencester R.D. 2, and 1 each in Stroud U.D. and R.D.); Essex 11 (West Ham 3, East Ham 2, and 1 each in Colchester M.B., Ilford M.B., Romford M.B., and the urban districts of Brentwood and Thurrock, and the rural district of Halstead); Surrey 11 (2 each in Guildford, Kingston, and Wimbledon, and 1 each in Epsom and Ewell M.B., Mitcham M.B., Sutton and Cheam M.B., Woking U.D., and Hambledon R.D.); Chester 8 (Birkenhead 2, Chester 2, and 1 each in Wallasey C.B., Bebington M.B., Wilmslow U.D., and Runcorn R.D.); Glamorgan 8 (1 each in Cardiff, the urban districts of Aberdare, Caerphilly, Llwchwr, Maesteg, and Port Talbot, Rhondda, and the rural district of Cowbridge); Southampton 8 (Portsmouth 3, Southampton 2, and 1 each in Bournemouth C.B., Aldershot M.B., and Eastleigh M.B.); Stafford 8 (Smethwick 2, and 1 each in Burton-on-Trent, Stoke-on-Trent, Walsall, Wolverhampton, Rowley Regis M.B., and Stafford M.B.); and 5 cases each in Lincoln (Lindsey), Middlesex, Worcester, Yorks, North Riding, and Monmouth. In Scotland notifications rose from 35 to 43; these were recorded in the counties of Aberdeen, Ayr, Dumbarton, and Fife, 2 each; in Angus, East Lothian, Midlothian, Perth and Kinross, Renfrew, Clackmannan, Dumfries, and Zetland, 1 each; and in Glasgow 15, Edinburgh 4, Aberdeen 3, Falkirk 2, and 1 each in Arbroath, Dundee, and Dunfermline.

No. 1

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended January 4, 1941.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	(b)	(c)	(d)	(e)	1940 (Corresponding Week) (a)	(b)	(c)	(d)	(e
Cerebrospinal fever	229	14	43	—	6	52	4	13	—	—
Deaths		3	1				2	—		
Diphtheria	1,396	59	405	29	40	796	31	202	32	35
Deaths	54	2	13	—	2	23	1	7	1	
Dysentery	68	—	17	5	—	35	1	18	—	—
Deaths			—	—	—			3	—	—
Encephalitis lethargica, acute	2	—	1	—	—	3	—	18	—	—
Deaths		1	—	—	—		1	3	—	—
Enteric (typhoid and paratyphoid) fever	18	—	7	6	—	12	2	4	4	—
Deaths	—	—	—	—	—	1	—	—	—	—
Erysipelas		21	53	9	3		—	65	4	7
Deaths		—	—					1		
Infective enteritis or diarrhoea under 2 years										
Deaths	34	4	7	5	2	26	3	6	3	4
Measles	17,916	496	90*		5	2,534	17	14		135
Deaths	21	5	2	1		3	—	—	—	3
Ophthalmia neonatorum	62	4	6		—	67	1	16		1
Deaths										
Pneumonia, influenzal†	1,297	67	15	—	13	1,106	96	21	8	23
Deaths (from influenza)	53	8	4	6	—	94	20	12	1	1
Pneumonia, primary	—	—	260	8		—	—	349	16	
Deaths		79		12	22		71		11	19
Polio-encephalitis, acute	1	—				3	—			
Deaths		—					—			
Poliomyelitis, acute	9	—	2		—	7	—	—	—	1
Deaths		—					—			
Puerperal fever	2	2	4	2	1		2	7	2	—
Deaths		—					1‡			
Puerperal pyrexia	120	4	10		2	124§	10	5		1
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,335	74	176	46	36	1,123	44	171	50	70
Deaths	3	—	1	1		3	1	—	1	1
Small-pox	—	—	—		—	—	—	—		—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	1	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	2,783	24	81*		23	727	20	10		3
Deaths	27	2	6	3	1	4	—	1	—	1
Deaths (0–1 year)	432	37	65	39	29	380	40	53	27	15
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	7,273	1,187	730	235	197	7,756	1,433	1,000	255	194
Annual death rate (per 1,000 persons living)			15.9	18.9	17.3			20.2	19.2	17.0
Live births	4,789	363	316	267	257	6,532	901	900	370	261
Annual rate per 1,000 persons living			17.8	19.1	22.5			18.2	20.9	22.9
Stillbirths	204	16	43			269	30	39		
Rate per 1,000 total births (including stillborn)			50					42		

* Notification in certain administrative areas only.

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

‡ Death from puerperal sepsis.

§ Includes figures for puerperal fever.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Why Not Morphine for Small Babies?

DR. W. F. MOORE (Inch, Co. Wexford) writes: When I was a student I was taught that morphine ought not to be given to young children, and I notice that Dr. Leonard A. de Dombal (January 4, p. 32) in the case of young babies gives pot. brom. instead of morphine. After being in practice some years I ignored the above teaching, and found morphine a useful and safe drug, even in very young babies. I worked out a dose which I found to act quite well: for each month of the child's age I gave 1/16th of a minim of liq. morph. mur.—that is, for a child, say, 5 months old I added 5 minims of liq. morph. mur. to a 2-oz. bottle of water and gave teaspoonful doses. I gave this even to younger babies. This small dose seemed to give great relief and was quite safe.

Income Tax

Wife Living Abroad

"J. A." has a wife and child living abroad. "Owing to adverse conditions" he was not able to send his wife her remittance for 1939, but is now sending her a draft to cover her expenses for that year. He has been refused the marriage allowance for 1939–40.

*** We assume that "J. A." is not legally separated from his wife, in which case the fact that they are residing in different countries for the time being would not appear to invalidate his claim to the married man's allowance. In any case, however, the fact that he is now sending his wife a draft to cover her "support" for 1939–40 goes to show that he supported her for that year. If the local inspector declines to make the allowance we advise our correspondent to write to the Secretary, Board of Inland Revenue, Somerset House, W.C.2. The inspector's request for "a record of *personal* expenses" is quite unusual. In the absence of any statement as to the particular reason for the request, however, we cannot make further comment.

LETTERS, NOTES, ETC.

Treatment of Paronychia

DR. H. G. LANGDALE-SMITH (Tarrington) writes: Paronychia was more prevalent than usual last autumn, and although sulphanilamide preparations applied locally had little effect I found that good results were obtained if Bier's congestive treatment was preceded by administration of sulphanilamide. Sulphanilamide is absorbed into the blood stream within half an hour of its administration by the mouth, and is distributed evenly in the circulation, reaching its maximum concentration within six hours. If Bier's treatment is applied within this period one would expect a high concentration of the drug to the affected region. I wonder if this could not be applied to war wounds infected by the streptococcal group. One well remembers the devastating effect of infection in the last war and the many methods used to mitigate it.

With regard to the usual instruction of withholding eggs, onions, and salts during administration of a sulphonamide, one wonders if it is necessary to include salts. I understood from one authority that the only contraindication to using salts was that peristalsis liberated free sulphur from the intestinal contents, and that any aperient might do the same. It seems probable that salts are not altered chemically in the small intestine, or else there would be little osmosis effect; whereas the sulphur of eggs and onions would no doubt be split up in the small bowel and would find its way through the portal system into the systemic.

Diphtheria Incidence

DR. R. M. COURTAULD (Earls Colne, Essex) writes: While thanking Dr. Anderson (January 25, p. 144) for his letter, I am bound to say that I do not find in it the explanation for which I asked. The question is: Why, when many more children than previously have been immunized against diphtheria, is there more diphtheria now than there was a year ago? In the Epidemiological Notes in the *Journal* of January 18 there are comments upon the present incidence of diphtheria, but I cannot find in them the explanation asked for. If a record were kept of the respective numbers of inoculated and uninoculated diphtheria patients admitted to isolation hospitals a practical test would be provided of the efficacy of the immunizing methods now in use.

Human Fertility

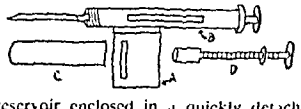
DR. ELLIA BERSTOCK (Maltby) writes: I have been interested in Dr. John Pryde's article (January 4, p. 12) and in the correspondence culminating therefrom. In matters concerning the menstrual cycle and the fertility of women during certain periods of this cycle one cannot state any dogmatic rules. Every woman is a law unto herself. I should say, from various observations I have made, that 50% of women at various times of their menstrual cycle as well as at various different times of the year are less fertile than at others. We know that is a fact with the majority of other mammals. The "safe period of Knaus" does exist, but no reliance can be put on it unless the woman has had coitus previously and did not conceive; even then it is possible that all the various adjuvants to conception taking place may not have been present—that is, love-making, desire of the two parties, etc. Often when sexual intercourse is denied, as in the case cited by Dr. R. Palmer (January 25, p. 137), it is found that when renewed after a period of continence the safe period which may have existed before in the woman is in abeyance, partly because of the repression and the intense desire of the two parties for cohabitation, and possibly because of the greater sperm strength and motility.

Medical Service in China

DR. ANDREW MORLAND, chairman of the Medical Subcommittee, Friends Ambulance Unit, writes from 135, Harley Street, London, W.1: It is hoped to send a fully equipped ambulance convoy of some fifty or sixty members of the Friends Ambulance Unit to Central China as soon as possible, and the Foreign Office has approved of the expedition. A number of doctors will be required, and it is hoped that the convoy will comprise a mobile team. Qualified men of British nationality who would like to join the convoy should apply to me.

A Repeating Syringe

MAJOR E. M. ROBERTSON FRAZER writes: Recent experiences have led me to experiment with a syringe which would be capable of carrying its own "magazine" of solution, and, by "pre-setting" the dose, could be used in the dark or for dealing with numbers of cases all requiring the same dose. Such applications would be found in the injection of morphine or in inoculations. Messrs. Abbott's Laboratories (England), Ltd., have now placed such an instrument on the market.



A is a glass reservoir enclosed in a quickly detachable metal cover fitted with a "window" and holding 50 c.cm.

B is a 2-c.cm. glass syringe enclosed in a metal barrel (with slit window).

C is a quickly detachable metal needle protector.

D is an adjustable stop to limit the travel of the plunger and thus regulate the capacity of the barrel.

The whole can be carried in the pocket and cannot be spilled. The dose may be "pre-set" from 0.1 c.cm. to 2 c.cm. as in the regulation Army syringe, but the presence of air can be detected in the window. The mechanism is simple, and the two ball-valves cannot get out of adjustment. The needle cap can be kept filled with a quantity of carbolized vaseline, the needle stylet being left *in situ*. In action, one withdrawal of the plunger fills the syringe, one "push" completes the injection, and the syringe is recharged with the next withdrawal, and so on, until the reservoir is empty. Injections are made as easily as with the standard type of syringe, and the time saved when dealing with large numbers is considerable. The whole instrument may be sterilized by washing out with alcohol or by boiling, while the needle may be changed between injections or sterilized by flame. It is suggested that such an instrument might also be of use to school and public health clinicians, or for intravenous anaesthesia.

BRITISH MEDICAL JOURNAL

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THE EFFECT OF PERITONEAL IRRITATION ON THE ACTIVITY OF THE INTESTINE

BY

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AND

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The management of abdominal distension occurring in the course of diffuse peritonitis is still a major surgical problem. Two principal views are widely held concerning the pathogenesis of the condition, the one contending that the distension is the result of multiple adhesive obstructions in the intestine, and the other that the activity of the intestine is reflexly inhibited by reason of the peritoneal irritation. The views might reasonably be termed respectively "mechanical" and "neurogenic." These two concepts are of more than academic interest, since the mode of treatment, operative or conservative, is influenced by the view held by the individual surgeon. There are, of course, cases in which the obstructive element is quite obvious. The patient who is suffering from painful attacks of colic and in whom peristalsis is audible often even without the use of a stethoscope is evidently not suffering from inhibition of intestinal activity. But it must be confessed that such cases are less common than those in which little evidence of intestinal activity can be detected.

The purpose of this paper is to present some observations on the effect of peritoneal irritation on the activity of the intestine. It is apparent that, in order to study reflex phenomena adequately, it is necessary in some way to separate the receptor and the effector elements in the hypothetical reflex arc. In other words, if equivocal results are to be avoided the adequate stimulus must be delivered at a site remote from that in which the reflex effect is to be studied. It was by the application of this principle that Pavlov was enabled to study the various phases of gastric secretion. The pouch which bears his name was so devised that he could collect samples of gastric juice from a portion of the stomach which, while retaining its nerve supply, was completely cut off from the adequate stimulus, which was the entry of food into the remainder of the stomach.

We endeavoured to find a method whereby this principle could be applied to the study of paralytic ileus; in other words, we wished to devise a preparation which would permit of the production of diffuse peritoneal irritation without at the same time producing local peritonitis of the intestine in which the reflex effect of the peritoneal irritation was to be expected. We believed that any effect which might be observed could, if time relations were compatible, be reasonably regarded as reflex in character, and would be a suitable phenomenon for the study of mediation of inhibition in the intestine in response to peritoneal irritation.

A complete review of the literature which has accumulated, particularly on the clinical side of this field, would be outside the scope of a communication of this type. Accordingly, it is proposed to refer only to the more important papers in the experimental field on which the neurogenic concept of paralytic ileus is based. Van Braam Houckgeest in 1872 made the observation that abdominal section and exposure of the intestines had an inhibitory effect on intestinal activity. It was not till 1899 that Bayliss and Starling found that this inhibition could be overcome after a short latent period by section of the splanchnic nerves. Cannon and Murphy (1907) showed that a similar type of intestinal inhibition could be caused in cats by local trauma to the intestines or reflexly by trauma to the testes, and, similarly, that this inhibition could be prevented by previous splanchnicotomy. In the rabbit, Melzer and Auer (1907) and Hotz (1909) demonstrated that certain inhibitory intestinal reflexes could be prevented by destruction of the cord to the third dorsal segment or by splanchnic section. Arai (1921) observed intestinal inhibition in cats after the intraperitoneal injection of irritant solutions, and King (1924) demonstrated similar inhibition in dogs from stimulation of bladder, rectum, peritoneum, and various skin areas. Olivecrona (1926–7) concluded that, in the cat, local reflexes mediated by way of the coeliac ganglia were capable of causing intestinal inhibition. Markowitz and Campbell (1927) and Ochsner, Gage, and Cutting (1928) showed that the inhibition of peritonitis in dogs could be prevented by spinal or splanchnic anaesthesia. Alvarez and Hosoi (1929) suggested that in the ileus of peritonitis a flattening of the normal gradient of forces occurred. Demel (1926) reported that atony of the bowel of the dog could be produced by retroperitoneal injection of blood. The recent work of Youmans, Herrin, and Meek (1938) suggests that distension of one part of the intestine causes inhibition of other parts.

Experimental Methods

Three main problems confronted us at the outset of this study. The first has already been referred to—namely, the devising of a suitable preparation. The second was the difficulty of finding a standard by which

inhibition of intestinal activity could be judged; the third was the choice of a method for the production of peritoneal irritation.

The first problem was solved by means of the preparation described by Biebl (1930) for the collection of samples of intestinal contents and used later by Castleton (1934) and Wangensteen (1937). It consists of an exteriorized loop of intestine, in continuity, with extrinsic nerve and blood supply intact, enclosed in a bipedicled tube of skin exactly similar to that used in plastic surgery (Fig. 1). The parietal and visceral peritoneum at the

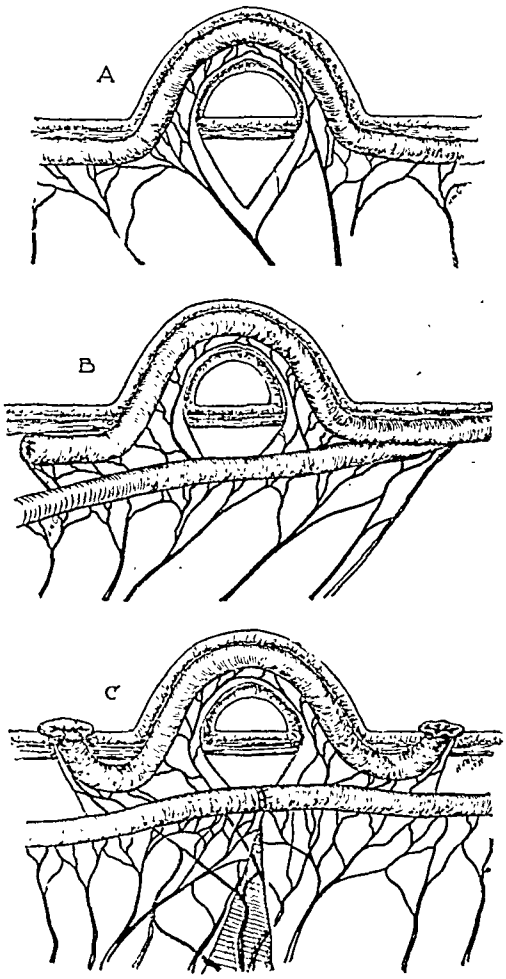


FIG. 1.—Types of exteriorized loops of intestine enclosed in bipedicled skin tubes. A: In continuity as used in the present study. B: Short-circuited. C: Isolated—analogous to the Thiry-Vella loop.

exit and entrance of the loop from the peritoneal cavity become firmly adherent to each other and so effectively seal off the whole loop from the peritoneal cavity, while the lumen of the bowel, exactly comparable to a colostomy loop before opening, remains patent. By virtue of the exteriorized position of the loop and of the effective sealing off of its visceral peritoneal surface from the general peritoneal cavity it is possible to set up an inflammatory process within the latter without in any way directly affecting the former. The operative procedure involved in the preparation of these loops is simple, the operative mortality is low, and the animals can be observed in good health for many months. The advantages and disadvantages of the preparation have been discussed in a previous communication (Douglas and Mann, 1939). For the present purpose the advantages appeared to outweigh the disadvantages.

As to the second problem, it requires only a cursory glance at the literature to realize that no accurate concept exists as to what constitutes inhibition of intestinal activity. One of the main causes of this confusion appears to lie in the fact that a great diversity of methods have been used to study intestinal activity. Thus workers with an intraluminal technique naturally tend to regard inhibition in terms of tonus; workers using enterographic methods lay stress on diminution of amplitude and rate of contraction; and those using radiographic technique speak in terms of the progress of food residues. Since coincident with a fall in tonus there may be an increase in the amplitude and rate of contraction, and vice versa, it is easy to see how conflicting results may arise. In order to avoid confusion of this type the term "inhibition of intestinal activity" in the present study has been taken to mean absolute quiescence of the intestine—that is, where neither by the recording technique nor visually could any movement whatever be observed. Inhibition was considered to have come to an end when the first contraction, however small, reappeared. Thus it was possible with some degree of accuracy to measure quantitatively the duration of inhibition.

In the production of peritoneal irritation the intraperitoneal injection of irritant solutions was adopted for the following reasons: (1) the technique of intraperitoneal injection is a well-standardized procedure, simple of execution, requiring no anaesthesia, and without detrimental effect on the animal; (2) the method has been used extensively in studies of this nature, and the injection of a known quantity of irritant solution is in some respects quantitative and is easily controlled by the injection of bland non-irritant solutions; (3) the injection is in the nature of a sudden peritoneal insult analogous to the perforation of a hollow viscus, and is therefore well suited to the present study; (4) finally, recovery from the small quantities of irritant solution used was rapid and uneventful.

In view of the species differences which are said to exist with respect to intestinal activity it was thought wise to study two types of animals. The rabbit and the dog were therefore used, and, in order to have data on the small and large intestine, loops were prepared from the caecum of the rabbit and the ileum of the dog. Records of intestinal activity were taken in the rabbit by an enterographic method and in the dog by a double-tambour air-displacement system (Fig. 2).

Procedure of the Experiments.—The same technique was used throughout. The animal was fed before the experiment to ensure maximum activity of the intestine. It was then placed on an observation table, upon which it had been previously trained to lie. A 20-gauge needle was inserted into the peritoneal cavity and a length of rubber tubing attached to it, secured to the abdominal wall by adhesive tape. A control tracing of intestinal activity was then taken for a period of fifteen minutes. A measured quantity of Ringer-Locke's solution at 39° C. was now injected into the peritoneal cavity and the tracing was continued for thirty minutes. A similar quantity of irritant solution at 39° C. was then injected and the tracing was continued for a period of two to three hours. Since the tracing was taken continuously throughout the whole of the experiment it was possible to record the reaction of the exteriorized loop of intestine to the intraperitoneal irritative process. In no instance did the injection of Ringer-Locke solution have any effect on the intestinal activity.

Preparations.—Experiments were carried out in the following preparations: (1) the normal animal; (2) the animal with bilateral splanchnic section; (3) the animal with bilateral vagal section; (4) the animal with unilateral splanchnic section; (5) the animal with bilateral adrenal-

ectomy. The splanchnic nerves were severed through a lumbar approach, the vagi through a thoracic approach immediately above the oesophageal hiatus in the diaphragm. No experiments were carried out after the nerve sections until a period of at least three weeks had elapsed. This was to allow of degenerative processes in the synaptic connexions which these nerves make in the myenteric plexus. The adrenalectomized animal was given a daily maintenance dose of adrenal cortical extract and a diet

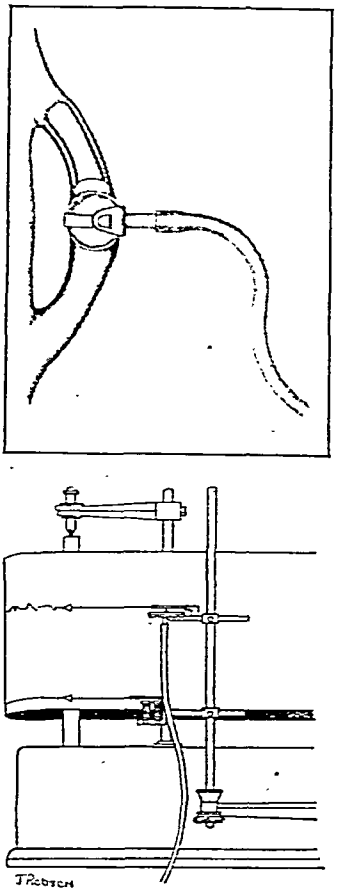


FIG. 2.—Simple air-displacement system. The receiving tambour is attached to the intestinal loop by an inelastic aluminium clip.

low in potassium. Both the animals with nerve sections and the adrenalectomized animal maintained good health and, so far as could be judged by bowel habits and tracings of intestinal activity, showed no deviation from the normal in respect of the alimentary canal. This is in accordance with the findings of other observers.

Results

THE RABBIT

The Normal Rabbit.—Eleven experiments were carried out in the normal rabbit. In all of them immediate and prolonged inhibition of the movements of the loop was observed in response to the intraperitoneal injection of a small amount of irritant solution (Table I). The nature of the irritant solution did not appear to be of importance, since sodium ricinoleate solution, turpentine emulsion, and Lugol's iodine solution produced a similar result.

TABLE I.—*Effect of Intraperitoneal Injection of Irritant Solution on the Activity of the Intestine of the Rabbit*

Animal	Irritant	Quantity in c.cm.	Dilution	Inhibition	Duration in Mins.
		Normal Rabbit:			
1	Sodium ricinoleate	5	1 : 50	+	120
2	Lugol's solution	3	1 : 10	+	35
3	Turpentine	2	1 : 20	+	103
4	Lugol's solution	2	1 : 10	+	30
5	"	2	1 : 10	+	43
6	"	3	1 : 10	+	47
7	"	3	1 : 10	+	62
8	"	2	1 : 10	+	40
9	"	2	1 : 10	+	32
10	"	3	1 : 10	+	45
11	"	2	1 : 10	+	33
		Splanchnicotomized Rabbit:			
12	Lugol's solution	3	1 : 10	Nil	
13	"	3	1 : 10	"	
14	"	3	1 : 10	"	
15	"	3	1 : 10	"	
16	"	3	1 : 10	"	

The Splanchnicotomized Rabbit.—Five experiments were performed in the rabbits which had had both splanchnic nerves previously sectioned. Although these animals showed a similar systemic response to the injection of the irritant, in no case was inhibition of movements of the extraperitoneal loop observed (Table I).

THE DOG

The Normal Dog.—Five experiments were carried out in the normal dog. As in the normal rabbit, immediate and prolonged inhibition of activity in the extraperitoneal loop was observed (Table II and Fig. 3).

TABLE II.—*Effect of Intraperitoneal Injection of Irritant Solution (Lugol's Iodine) on the Activity of the Intestine of the Dog*

Animal	Quantity in c.cm.	Dilution	Inhibition	Duration in Mins.
		Normal Dog:		
1	4	1 : 2	−	75
2	3	Undiluted	−	240
3	4	1 : 3	+	54
4	4	1 : 3	−	53
5	4	1 : 3	−	94
		Splanchnicotomized Dog:		
6	4	1 : 2	+	1
7	4	1 : 2	Nil	
8	4	1 : 2	+	0·25 (15 sec.)
		Vagotomized Dog:		
9	2	1 : 3	+	75
9	3	1 : 2	+	64
		Unilaterally Splanchnicotomized Dog:		
10	4	1 : 4	+	81
10	3	1 : 4	+	72
		Adrenalectomized Dog:		
11	4	1 : 2	+	32
11	4	1 : 2	+	32
11	4	1 : 2	+	24

The Splanchnicotomized Dog.—Three experiments were carried out in the animals with bilateral splanchnic section (Table II). In one experiment no inhibition was noted in response to the intraperitoneal injection of the irritant solution; in the two others transitory delayed inhibition was noted (Fig. 3). The same experimental manœuvre produced in the normal dog immediate and prolonged inhibition.

The Vagotomized Dog.—Two experiments were carried out in the vagotomized dog. Prolonged inhibition of intestinal activity was observed in both (Table II). The reaction was similar to that seen in the normal dog (Fig. 3).

The Unilaterally Splanchnicotomized Dog.—Two experiments were carried out in the unilaterally splanchnicotomized dog. As in the normal dog and the vagotomized dog, prolonged inhibition of activity in the extraperitoneal loop occurred (Table II and Fig. 4).

The Adrenalectomized Dog.—Three experiments were carried out in the dog which had had both adrenal glands removed three weeks before. In all three experiments a result similar to that seen in the normal dog was noted—namely, immediate and prolonged inhibition of intestinal activity (Table II and Fig. 4).

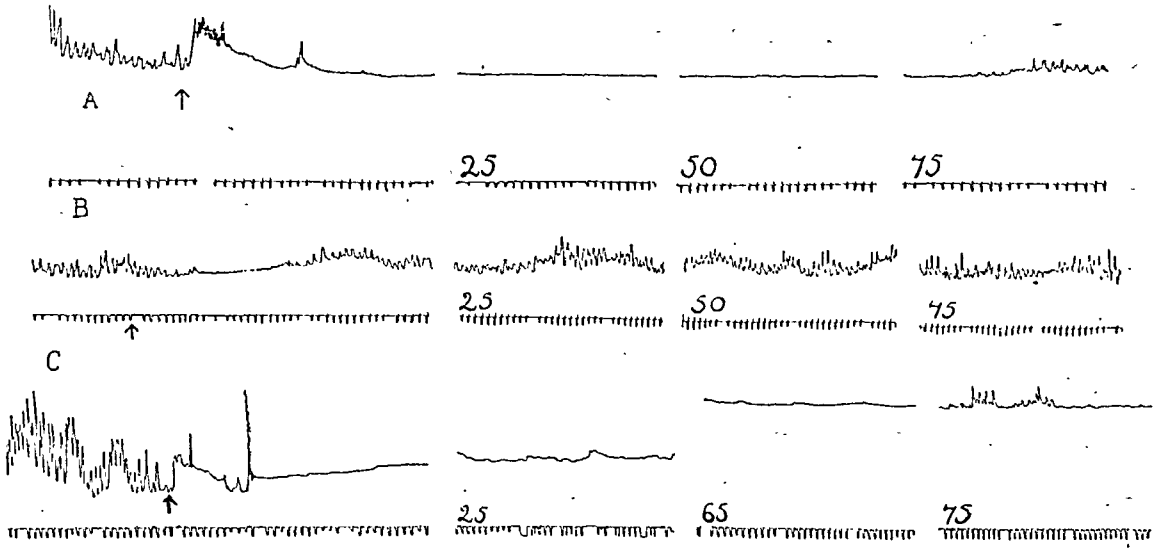


FIG. 3.—Effect of intraperitoneal injection of irritant solution on the activity of the intestine. At arrow, standard quantity of solution injected into peritoneal cavity. Large numbers indicate minutes. Time in 5-second intervals. A: Normal dog. B: Dog with bilateral splanchnic section. C: Dog with bilateral vagal section.

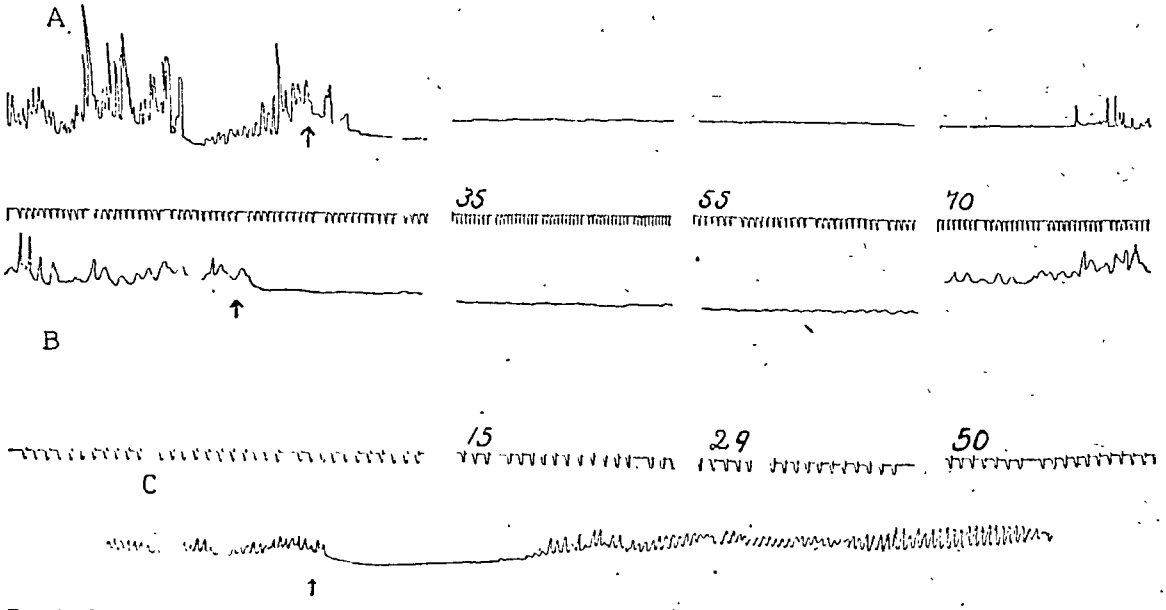


FIG. 4.—Effect of intraperitoneal injection of irritant solution on the activity of the intestine. At arrow, standard quantity of solution injected into the peritoneal cavity. Large numbers indicate minutes. Time in 5-second intervals. A: Dog with unilateral splanchnic section. B: Dog with bilateral adrenalectomy. C: Effect of intravenous injection of 0.25 c.cm. of adrenaline on the activity of the intestine.

Comment

The arrest of intestinal activity consequent on the injection of irritant solutions into the peritoneal cavity noted in this study is in all likelihood true reflex inhibition, since no drugs were used, there was no handling of the bowel, and no foreign bodies were introduced into the bowel. Moreover, the arrest occurred irrespective of the nature of the irritant solution, and no arrest was observed when a non-irritating solution such as Ringer-Locke was used. A direct effect on the bowel could be excluded because of the extraperitoneal situation of the bowel under study.

The experiments after bilateral vagal section indicate that the vagus nerves play little part in mediating the inhibition either as afferents or efferents, since the inhibition is similar to that seen in the normal animal. Similarly, the observations after unilateral splanchnic section indicate that the absence of the splanchnic nerves on one side alone does not prevent the mediation of the inhibition. The experiments after bilateral splanchnicotomy, on the other hand, indicate that the inhibitory process is mediated through the splanchnic nerves, since either no inhibition occurred or, as in two experiments, it was momentary.

It is well known that adrenaline causes inhibition of intestinal activity (Fig. 4). It was with this consideration

in mind that experiments were carried out in the adrenalectomized animal. The inhibition seen in the adrenalectomized animal was similar to that in the normal animal, though of shorter duration. It may be that part of the inhibition observed in the normal animal is mediated by the adrenal medullary principle and that the transient inhibition seen in two experiments in the splanchnicotomized animal was similarly effected.

Olivecrona (1926-7) attempted to draw a distinction between rhythmic and peristaltic activity in respect to their response to peritoneal irritation, indicating that the latter type is very readily inhibited whilst the former persists. An analysis of this type is extremely difficult under reasonably normal experimental conditions, and it was therefore purposely avoided in this study. Since, however, we took absolute quiescence as the criterion of intestinal inhibition the problem did not arise.

We are well aware of the danger of applying experimental observations to clinical problems. Nevertheless it seems of considerable interest that an irritative process within the peritoneal cavity is capable of bringing about a prolonged arrest of activity in intestine which is entirely remote from the peritonitis. We take this as reasonable evidence that the neurogenic or reflex concept of distension in diffuse peritonitis is not the chimera which many authors suggest, particularly when so many cases recover without operative intervention. To enter into a discussion on the virtues of the various lines of treatment would be outside the scope of a paper of this kind, but it is permissible to suggest that enterostomy or enteroanastomosis is not likely to meet with success in cases in which the activity of the intestine is inhibited. We would therefore plead that, in the absence of obvious intestinal activity, there are good grounds for the adoption of conservative measures in the treatment of the distension of peritonitis. Measures calculated to overcome splanchnic inhibition such as splanchnic block or the use of acetylcholine protectives such as prostigmin would appear to be rational therapy.

Summary

1. Extraperitoneal loops of bowel in continuity were prepared in the rabbit and dog. A loop of the caecum was chosen in the former, of the small bowel in the latter.

2. Peritoneal irritation produced by intraperitoneal injections of a standard irritant solution was constantly associated with prolonged arrest of movements in the extraperitoneal loop in the trained animal.

3. The arrest of intestinal movements occurred after degenerative section of both vagus nerves, of one splanchnic nerve, and after bilateral adrenalectomy.

4. After degenerative section of both splanchnic nerves the arrest did not occur or was only temporary.

5. The arrest is in the nature of reflex inhibition, because by reason of the extraperitoneal situation of the loop of bowel the stimulus is delivered to afferents other than those in the loop.

6. The anatomical pathway of the reflex arc is not fully determined.

(*a*) The receptor endings are in the peritoneal cavity, but whether in parietal or visceral peritoneum or both is unknown. Cannon and Alvarez have each found evidence for visceral receptors; Hotz and King have found evidence for parietal receptors.

(*b*) The afferent limb of the arc is similarly unknown. Cerebrospinal afferents from the parietal peritoneum are almost certainly involved.

(*c*) The connector element is made up of the preganglionic neurones of the thoracic outflow which constitute the splanchnic nerves.

(*d*) The efferent limb of the arc is made up of the postganglionic sympathetic neurones issuing from the coeliac plexus.

(*e*) The effector endings are in the extraperitoneal loop of the bowel.

7. In the normal animal it is possible that part of the duration of the inhibition may be mediated by adrenaline, and that in the animal with bilateral degenerative section of the major splanchnic nerves the transitory inhibition noted was similarly mediated.

The findings are taken to indicate that prolonged intestinal inhibition may result reflexly from irritation of the peritoneum, that the inhibition is mediated by the splanchnic nerves, and that there is a sound physiological basis for the neurogenic concept of paralytic ileus.

It is a great pleasure to make acknowledgment to the Commonwealth Fund, New York, and to the Mayo Foundation, Rochester, Minnesota, for their kindness and for the facilities for carrying out this work.

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TREATMENT OF OPEN WOUNDS BY THE SULPHANILAMIDE PACK

BY

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Major, R.A.M.C.

This is an account of a method of treatment for open wounds employed by the surgical specialist to a casualty clearing station during the fighting in France and Belgium which ended with the evacuation of Dunkirk. If the reader finds the article lacking in specific detail he is asked to remember that all the writer's records, together with the rest of his personal belongings, were lost at Dunkirk, and that the paper is not meant to be an exhaustive survey from which conclusions may be drawn, but rather one surgeon's experience in a limited number of cases.

The method used in this treatment of open wounds was to pack them with powdered sulphanilamide. Sulphapyridine (M & B 693) was never used. At no time during the treatment was sulphanilamide given by mouth, nor was it given to controls treated with a flavine pack. Any effect was exerted by the presence of sulphanilamide locally in the wounds. The anaesthetic employed was sodium pentothal, combined with gas-and-oxygen.

Technique

Pre-operative treatment was as in ordinary surgical procedure. The skin edges of the wound were then excised and the depths of the wound examined. After the extent of the wound had been ascertained the skin opening was enlarged and the whole area laid open to allow for drainage. As a general rule the area of damaged muscle was very much greater than the aperture which led to it through the skin. This was particularly the case in wounds from trench-mortar fragments.

All muscle fragments, all discoloured muscle, and all muscle which although apparently healthy in colour did not respond to stimulation by contraction or twitching were removed. Whenever doubt existed as to the viability of the muscle it was left and no extensive excision was undertaken. The wound was made shelving so far as possible during this excision of muscle. Absolute haemostasis was then secured, all bleeding points being ligatured and all the oozing checked by the introduction of hydrogen peroxide into the wound. Powdered sulphanilamide was then placed in the cavity. It is of the greatest importance to introduce it into every corner, pocket, etc., of the wound. Failure to observe this precaution is, in my opinion, responsible for partial failures and doubtful results. When treating the first few cases sulphanilamide was poured into the wounds. This was found to be unsatisfactory, as some corners were left untouched. A large Volkmann spoon was then used to introduce the powder. This was also found to be unsatisfactory, although better than merely pouring it in. When in contact with the serous exudate on the surface of cut muscles the powder becomes a paste and adheres to the muscle, so that most of it is lost from the spoon by the time the deeper recesses are reached. Moreover, the remainder tends to adhere to the spoon, will not pour, and is difficult to get into the deeper recesses. Finally, half a tablet of sulphanilamide was held in the jaws of a pair of Spencer Wells forceps, and introduced into the depths of the wound at the required site. The half-tablet was then crushed by the forceps, the forceps withdrawn, and the crushed half-tablet left in the required position. This procedure was repeated in any part of the wound that seemed unlikely to be reached by the mere pouring in of powder. After all recesses had been filled in, the main cavity was packed with powdered sulphanilamide, 20 grammes being introduced. Insufflation might be still more simple than the above method. I have not tried it, as the necessary equipment was not available.

After the wound had been filled in with sulphanilamide it was left open, no attempt at suture being made. The open wound was covered with gauze smeared with sterile vaseline, and over this was placed elastoplast or zinc oxide strapping, with the intention of closing the wound and of drawing the skin edges together so far as was possible. Wool was superimposed and the whole bandaged. If the wound involved a compound fracture the appropriate extension was applied.

During the ensuing twenty-four hours there was always some blood-stained serous ooze which soaked through the wool and bandage. This did not necessitate removing the bandage, but a fresh layer of wool was applied, this being covered with a fresh bandage. This procedure was repeated if necessary. The wound was not interfered with. No further treatment was undertaken until the fifth day after operation, when the wound was dressed and delayed primary suture was undertaken. By this time all the sulphanilamide had dissolved, and the wound was clean, had begun to granulate, and was suitable for suture.

The total number of cases treated by this method amounted to between 40 and 50. They fell into two groups—those treated previous to May 10, 1940, and those treated between May 10 and May 29. The former group comprises cases arising when an army is in the field and not in action with the enemy, and consists of compound fractures and penetrating wounds arising from road accidents, football accidents, etc.—exactly similar to cases met with in ordinary civil practice. The second group comprises cases resulting from enemy action —gunshot wounds, wounds from bomb splinters, trench-mortar splinters, etc.—cases similar to those met with in this country after enemy air raids. All the cases treated were wounds of limbs: no attempt was made to treat by this method abdominal, chest, or head wounds.

Group I: Cases Treated Before May 10, 1940

Cases treated in this group show a further difference from the cases treated subsequently. A culture was taken from the depths of the wound before any treatment was instituted, and a further culture was taken five days later when the wound was first dressed. Working in a C.C.S. I did not see the results of my treatment, since the cases had been evacuated to the base by the fifth day; but by courtesy of Colonel Leonard Colebrook, R.A.M.C., I was supplied with details of the progress of my cases, and could thus form an estimate of the value of this method of treatment.

After May 10 there was neither time nor opportunity for the procedure carried out previously. Cases were treated with the sulphanilamide pack, and owing to the delay in evacuation it was often possible to observe them for five days after treatment. A further difference between the two groups must be emphasized. Before May 10 cases were admitted and treated shortly after their injury, the usual interval being six hours or less, except in those with severe shock, which it was necessary to treat before attempting anything else. After May 10 cases were admitted to the C.C.S. days, not hours, after being wounded. Forty-eight hours' interval was normal; seventy-two hours' interval was frequent. Consequently infection was established before treatment was instituted; so that while it may be said that this treatment before May 10 was prophylactic, after May 10 it was definitely curative in action.

Group I cases comprised compound fractures of the long bones, penetrating wounds of joints, deep lacerations of the limbs, and two cases of stab wounds. Their total number was 15. They were all treated in the manner described under the heading "Technique," except that in the early cases not enough care was taken to ensure that the powder reached every recess in the wound. Certain of these cases have remained in the memory. They are given here, not necessarily in chronological order.

Case 1. A Motor-cycle Accident.—The left foot had been nearly avulsed. The patient was suffering from a compound comminuted fracture of the lower end of the left tibia, the capsular ligament of the left ankle-joint had been ruptured, and the cavity of the joint was exposed. The patient was admitted about six hours after the injury had been inflicted. The wound was excised and sulphanilamide introduced. A culture was obtained before treatment. This failed to grow organisms. The joint was fixed in the best position for ankylosis, on a back splint, and forty-eight hours later the patient was transferred to the base. After five days the wound was dressed and found to be completely sterile. It was sutured, and so far as my information extends the patient made an uninterrupted recovery.

Case 2. A Motor-cycle Accident.—There was a penetrating wound on the inner side of the right knee-joint. The joint surfaces were exposed, and much debris was present in the wound. The synovia was sutured with interrupted suture. The remainder of the wound was excised and packed with sulphanilamide. A culture was negative. The joint was fixed in the best position for ankylosis. After five days the wound was sterile. Delayed primary suture was performed, and the patient made an uninterrupted recovery.

Case 3. Deep Laceration of Anterior Aspect of Thigh.—Preliminary culture was sterile. Sulphanilamide was poured into the wound. This was an early case. The report from the base was to the effect that on dressing the wound five days later most of it appeared to be healthy. However, a bead of pus was noticed in one corner of the wound. Cultures of this bead revealed the presence of *Streptococcus haemolyticus.*

Cultures from the remainder of the wound were sterile. The patient suffered from no general disturbance, and his temperature and pulse were normal.

In no case was there any rise in the temperature or the pulse rate during the first forty-eight hours after treatment in patients treated by this method. They, without exception, described themselves as feeling very well. They slept well and morphine was not required. There was no cyanosis, and no signs were observed of overdosing with the sulphanilamide. Sulphanilamide is not a very soluble substance, and the powder is dissolved gradually and gives a steady supply of the drug. Other information about these cases is not available. Two cases revealed the presence of *Streptococcus faecalis* after five days, and in these I am doubtful of the efficacy of my technique.

Group II: Cases Treated After May 10, 1940

These comprise cases which were for the most part heavily infected before treatment was started. These patients had been wounded days before they arrived for treatment. No cultures were taken, and no attempt was made to diagnose the individual infection, but a rough classification was made into wounds infected by gas-producing organisms and wounds not so infected. The latter included both staphylococcal and streptococcal infections. The former included presumably infections by all forms of gas-producing organisms. These were diagnosed by the smell issuing from the wounds, the crepitus in the surrounding tissues, the presence of frothy discharge in the wound, the presence of blackened muscle bellies adjacent to apparently normal muscle, and the general condition of the patient: running pulse, brown furred tongue, intense toxaemia, and sometimes delirium. As the arrangements for evacuation were not working smoothly we were compelled to keep our wounded for some time until new arrangements could be improvised. This enabled us to watch the progress of each case for a period longer than was possible during the time that routine evacuation was taking place.

In this period, also, circumstances compelled us to treat many wounds with a flavine pack, since our supplies of sulphanilamide were limited. Thus an involuntary system of controls was instituted, and we were able to watch the progress of a series of wounds treated with sulphanilamide and to compare them with a series treated with flavine. As a general rule we reserved our sulphanilamide for the more serious, the more heavily infected, and the more extensively lacerated wounds. Flavine was used for gunshot wounds, for wounds that did not seem seriously infected, and for cases in which, whatever—within limits—the condition of the wound, the patient's general condition, the absence of toxaemia, etc., showed that he was resisting well without outside aid. All wounds in which crepitus extended from the wound and in which frothy discharge showed infection with gas-forming organisms were treated with sulphanilamide so far as our means allowed.

The following two cases seem worthy of mention:

Case 4.—Described to me by the surgical specialist of another C.C.S. Case admitted three days after wounds from bomb splinters. Wound of lower portion of left thigh involving compound fracture of left femur, and a further wound of the upper portion of the left leg involving the antero-external muscular part of the leg. There was also a compound fracture of the left tibia in its upper end and gas gangrene in both wounds. Wounds excised: gangrenous muscular bellies removed. Twenty grammes of sulphanilamide packed into each wound. Within twenty-four hours patient's general condition greatly improved. Pulse below 100; temperature, which had been subnormal, normal. This improvement was maintained. Two and a half days after the pack was introduced the patient complained of pain in the lower wound. The dressings were removed: no sulphanilamide powder remained; all had been dissolved. The wound appeared clean. A gauze pack was inserted. Subsequently the patient was encountered in England with his left leg amputated. He said that the lower wound had bled several times and was discharging pus. His left popliteal artery had been ligatured through the upper wound. This intervention had lighted up the gangrene infection and had necessitated amputation of the leg.

Case 5.—Wound of upper part of right thigh. Gas-gangrene crepitus extending over the anterior abdominal wall as far as the umbilicus. Excision and sulphanilamide pack. Complete recovery.

In most cases the early results were notable: within twenty-four hours after the treatment the general condition of the patient was much improved; toxaemia was greatly if not completely reduced, the pulse rate was down to normal, and the patient suffered from no pains and was alert, taking an interest in what was going on around. This improvement lasted for the whole time these patients were under our care. No patient who had received this treatment died while he was in the C.C.S.: this in spite of the fact that the wounds were heavily infected before admission. The same cannot be said for the cases treated with a flavine pack. In these cases toxaemia, a rapid pulse, and general asthenia persisted as a marked feature, and several patients who received no more than a flavine pack died whilst under our care. I am ignorant of the later results of this treatment, and indeed it is possible that these will not be as good as the early indications promised. Nevertheless, for the surgical specialist in a C.C.S. here is a treatment which appears to control infection in wounds at least long enough to get the patients back to a base hospital under normal conditions of evacuation, and this in itself is a great advance. It is possible that the work of the surgical specialist to a C.C.S. will in future resolve itself into securing haemostasis and packing with sulphanilamide in wounds of the limbs, if not of the abdomen, chest, and head.

Mode of Action

The mode of action would appear to be both general and local. Sulphanilamide has a general effect when injected subcutaneously, since cases of cerebrospinal meningitis in which persistent vomiting has prevented the oral administration of sulphanilamide have responded to the drug when injected subcutaneously; on the other hand, the necessity of applying the powder to every part of the wound points to some local action over and above the general action already noted. It may be that the gradual dissolving of the powder produces a local concentration which has a more powerful effect. The fact that large quantities of the drug have been used in the pack without signs of overdosing would seem to show that some local action takes place and that all the powder introduced does not get into the general circulation. These considerations raise the point as to whether it is necessary, in cases of multiple wounds, to pack each wound with sulphanilamide. If the action is solely a general one it should suffice to pack one wound only, or to insert the powder at a convenient site away from any wound. If there is a local effect superimposed on the general effect it will be necessary to pack each wound separately.

Summary

A number of wounded patients have been treated by packing the wounds with sulphanilamide powder. The technique of this method is described.

A number of cases are recorded, with the early results of the treatment, and the mode of action is discussed.

It is claimed that this treatment will at least save labour and time in casualty clearing stations by controlling infection until the patient arrives at a base hospital.

PARESIS FOLLOWING HERPES ZOSTER

A REPORT OF TWO CASES

BY

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Herpes zoster is usually a benign type of infection mainly affecting the sensory part of the nervous system. Motor symptoms occur infrequently, although both upper and lower motor neurone palsies following typical zoster have been recorded. Upper motor neurone lesions were described by Besta and Vercelli (quoted by Rocchi, 1938), Bruce (1907), and Worster-Drought and McMenemey (1933). In each of these cases there seemed no other explanation for the pyramidal lesions, although Alajouanine and Griffith (1931) recorded an enlightening case in which herpes zoster followed by upper motor neurone paresis of the right leg occurred in a girl aged 17 who six years later developed typical disseminated sclerosis. Among the lower motor neurone palsies the one most often encountered is facial paralysis and occasional deafness complicating geniculate zoster. Examples of this syndrome were described by Ramsay Hunt (1907), and it is now known by his name. The next most frequently reported palsy appears to be oculomotor paresis complicating trigeminal zoster. Cases of this type have been described by Essen-Möller (1936), Federici (1937), Carmody (1937), and others.

Brachial and abdominal palsies are more uncommon: Kinnier Wilson (1940) describes a zoster of C4 segment with weakness of the deltoid and biceps (C5). He also mentioned that in any given segment concerned "either all or a few or only one muscle may be affected." Taylor (1895) recorded a case of right abdominal zoster with paralysis of the recti and obliques, and Rocchi (1938) a case of zoster affecting segments D12 and L1 on the left side with weakness of the corresponding obliques, which showed a partial reaction of degeneration. Similar cases have been described by Bloedorn and Roberts, Worster-Drought, Taylor and Chairon (quoted by Kinnier Wilson, 1940).

Lower motor neurone paralysis complicating lumbar or sacral zoster seems a rare condition. Hardy (1876) and Cornil (1930) each described one case—the former zoster of the sciatic nerve with paresis of the calf muscles, the latter zoster of the thigh with atrophy of the quadriceps and loss of the knee-jerk. Davidsohn and Oppenheim (quoted by Rocchi, 1938) observed in a sacral zoster transitory motor disturbances of the bladder and rectum.

Two personal cases of lumbar zoster, very similar in distribution and course, are described here, both complicated by lower motor neurone paresis involving the affected segments.

Case I

A widow aged 73 was admitted to the Central Middlesex Hospital on January 15, 1940. For several years she had had epigastric pain of a typical peptic ulcer pattern. Apart from this she had been well until an attack of shingles in the right leg two months previously. Since then she had been shaky, and complained of neuralgia in and weakness of this leg, which tended to give way on walking.

On examination the patient was found to be, for her age, a very well preserved woman with a slight tremor of the lips, tongue, and arms. The scars of a recent herpes zoster were present on the inner side of the right thigh and on the front of the leg in the distribution of the third and fourth lumbar roots. Cutaneous sensation to pin-prick and cotton-wool was slightly diminished over this area; elsewhere it was normal. The right quadriceps was slightly wasted and its power and that of the abductors of the thigh diminished. All the tendon reflexes were brisk, with the exception of the right knee-jerk, which was absent. The plantar reflexes were flexor and the abdominals were absent. The arms, the cranial nerves, and the fundi oculi were normal. The peripheral arteries were hardened, but the heart and lungs were normal; blood pressure was 150/90, and the urine was normal. The occult blood reactions in the faeces were positive on two out of three examinations, and a barium meal showed evidence of a simple pyloric ulcer. A fractional test meal gave a normal result.

The cerebrospinal fluid on January 20 was under normal pressure and was clear and colourless. There were 21 cells per c.mm. present—1 polymorphonuclear leucocyte and 20 lymphocytes. The total protein was 0.035% and the Lange curve 0001221000. The Wassermann reaction was negative. On February 1 the fluid contained only 14 cells per c.mm.—1 polymorph and 13 lymphocytes. A radiograph of the spine showed osteo-arthritis and some osteoporosis of the thoracic and lumbar vertebrae.

The patient was given a course of faradism and exercises to the affected muscles. A gradual improvement in power took place, and before her discharge on February 21 the right knee-jerk was noted as just present; the neuralgia was less severe than on admission. In addition she had been put on to a peptic ulcer regime with marked benefit.

She has been seen at monthly intervals since, and the cerebrospinal fluid was re-examined on April 22 and was found to contain only 1 lymphocyte per c.mm. The protein was 0.035% and the Lange curve negative. The slow improvement in power continued, and the knee-jerk was gradually increasing in briskness. When last seen on July 20, nine months after the onset of the eruption, she was looking extremely well. She had lost her dyspeptic symptoms and had gained 10 lb. The neuralgia was occurring occasionally at night only and had diminished in intensity. The right leg now appeared to her to be as strong as the left, but on examination slight weakness of the quadriceps remained and the right knee-jerk was not quite as brisk as the left.

Case II

A married woman aged 53 was admitted to Shenley Hospital on April 3, 1938, with a severe depressive reaction state and suicidal tendencies. She slowly improved mentally and was occupying herself fairly well when on September 17 she complained of severe stabbing pain in the front of the right thigh. Next day she had a temperature of 99.8° and developed a typical herpetic eruption on the front of the thigh, which spread to the inner side of the right leg the following day. The lesions approximated to the distribution of L3 and L4 spinal segments. On this day—September 19—lumbar puncture was performed, and clear fluid under normal pressure was obtained. This contained 38 lymphocytes per c.mm. and 0.05% of protein. Four days later her temperature had settled, and she complained that she could not lift her right leg from the bed. The herpetic eruption had begun to heal, although pain was persistent: some analgesia was found between the drying vesicles. Wasting of the quadriceps was observed (half an inch), with almost complete loss of power; the adductors were normal; no fibrillation was present. Tendon reflexes were normal except that the right knee-jerk could not be obtained. On September 26, eight days after the eruption, the cerebrospinal fluid showed 28 lymphocytes per c.mm., with 0.045% protein. There was slight weakness of the adductors and complete flaccid paralysis of the quadriceps; the knee-jerk was still absent, and wasting had increased to 1 inch in circumference of the thigh. There was no improvement in the paralysis until October 1, when she could just extend the knee and flex the thigh, and the cerebrospinal fluid now showed 16 lymphocytes per c.mm., with 0.03% protein. The vesicles had disappeared, but nocturnal neuralgia still troubled her, although it was controlled by analgesics. Movement gradually improved with massage and exercise, and she had regained about half her power by October 14, although the knee-jerk was still absent.

On October 20, nearly five weeks after the beginning of the illness, the cerebrospinal fluid contained 11 lymphocytes, with 0.03% protein. Gradual improvement followed, and on November 17 it was noted that the right knee-jerk was just present. On December 19 the last lumbar puncture was done and 8 lymphocytes with 0.032% protein were found. Wasting was persistent and she still complained of occasional twinges of pain in the thigh and leg. The knee-jerk had returned almost fully five months after the onset, and power was fair, although she still used a stick.

When last seen about a year after her illness she was symptomless, except that the right leg tired easily. Examination revealed half an inch of wasting in the right quadriceps, persistent scars of the eruption, and great improvement in her mental condition. The right knee-jerk seemed as brisk as the left.

Commentary

These two cases demonstrate an unusual complication of herpes zoster. Although no complement-fixation test was done there was no reason to doubt the diagnosis, as the clinical features and the course were typical. It was considered important to exclude any underlying condition which might have been responsible for the paralysis, since it is well recognized that zoster may occur in other diseases of the spinal cord, particularly in disseminated sclerosis, tabes dorsalis, and cases of cord compression. There were no clinical signs to suggest the presence of any such lesion in our cases, although in Case I the history of dyspepsia and a positive occult blood reaction in the faeces led us to exclude by radiograph spinal metastases from possible carcinoma of the stomach.

The pathology of herpes zoster is still somewhat obscure, as so few cases come to necropsy. Head and Campbell in 1900 in an exhaustive paper mentioned that Bärensprung in 1861 first showed that zoster was a disease of the nervous system associated with changes in the posterior root ganglia. They described their post-mortem findings in 21 cases in which death occurred at all stages of the disease from three days to over two years after the outbreak of the eruption, and concluded that the primary lesion was an acute round-cell infiltration with areas of haemorrhage in the affected posterior root ganglia, and that changes found in the posterior nerve roots and spinal cord were secondary degenerative processes. The fact that Price (1937) gives a similar account of the pathology of zoster without mentioning the existence of any spinal cord lesions suggests that Head and Campbell's ideas are still in the main accepted in this country.

This view has been challenged by the French school, notably by Jean Lhermitte and his collaborators, who in three communications reported acute inflammatory changes not only in the ganglia but also in the posterior roots, the meninges, and the cord itself. In the first of these papers Lhermitte and Nicolas (1924) described the post-mortem appearances of a patient dying of bronchopneumonia seven weeks after the onset of the herpetic eruption. They found perivascular infiltration of leucocytes and mononuclear cells with vascular dilatation and demyelination in the posterior horns of the affected segments. The anterior horns showed atrophic changes in the cells with demyelination of the nerve roots and some lymphocytic infiltration: in spite of this no paralysis was observed clinically. There were no changes in the white matter except for one area in the pyramidal tract in which perivascular "cuffing" was observed. It is of interest to note that the cerebrospinal fluid of this case showed a pleocytosis of 88 lymphocytes per c.mm. on the second day of the eruption. Similar observations were recorded in two subsequent papers (Faure-Beaulieu and Lhermitte, 1929: Lhermitte and Vermès, 1930). In the former, lesions spreading to neighbouring segments were found in the posterior horns. Kinnier Wilson (1940) records similar findings by Nicolesco, Thomas and Laminière, and Schlesinger.

The view that the infection involves the meninges and the cord as well as the posterior root and its ganglion is supported by the frequent occurrence, according to Kinnier Wilson, of a pleocytosis in the cerebrospinal fluid. Both our cases were typical in this respect.

It would appear probable, therefore, that zoster is essentially an acute posterior poliomyelitis involving the whole of what we suggest may be called the "segmental sensory neurone." Although anatomically the root ganglia are placed outside the spinal cord, they consist of cells which have migrated out from the posterior horn, and thus their constant involvement is understandable. The finding of inflammatory changes in the anterior horn by Lhermitte and others is presumably due to the spread of the virus from the posterior horn, and would explain the occasional occurrence of motor lesions in a disease which primarily involves the sensory system.

Since so few cases have been described it is impossible to determine accurately the course and prognosis of paralysis complicating zoster. Our cases, in which identical segments were attacked, ran similar courses. The pleocytosis took many weeks to subside: Case I showed 14 lymphocytes three months after the onset, and Case II 8 cells nine weeks afterwards. When last seen, nine and twelve months respectively after the eruption, neither of these patients had fully returned to normal: Case I was complaining of nocturnal neuralgia in the leg and had a slightly diminished knee-jerk, and Case II showed slight wasting of the affected muscles. The crural paralyses in both Hardy's and Cornil's cases appear to have gradually improved, and in Rocchi's case the paralysis of the obliques had almost disappeared within a year. These cases show that though recovery is slow, satisfactory function can return within a year. The observation of further cases for longer periods would be necessary to determine whether this is the rule and whether complete recovery may not be possible.

Summary

Two cases of lower motor neurone paralysis complicating herpes zoster are described, and the pathology is discussed.

We desire to thank Dr. H. Joules for permission to publish Case I, which was under his care, and Dr. V. C. Robinson for his help in translating the literature.

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A. Christie (*J. Pediat.*, 1940, **17**, 502) reports that a follow-up study of children to test the duration of Schick immunity was made with various antigenic materials with the following results. According to the type of material, doses given, and the period between injections and the Schick test, 77 to 95% of the group showed negative Schick reactions in four to twelve weeks. After a four to nine year follow-up period 46 to 88% of the known Schick-negative reactions were found to be still negative and 12 to 54% had become positive. Christie concludes that all children immunized in the first year of life should be Schick-tested again on admission to school, when those who are positive should be given a stimulating dose of toxoid.

BELL'S PALSY AND HERPES ZOSTER

BY

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Major, R.A.M.C.

Clinical evidence has long led to the belief that the commonest aetiological agent in Bell's palsy is exposure to a cold draught. But its mode of action is obscure, and whether cold alone is adequate or whether it exerts its effect upon an already susceptible nerve has been the subject of much debate. Were cold *per se* the deciding factor one would expect a greater incidence, both total and seasonal. Seasonal figures, however, show no great variation, although it is a fact that one new case is commonly followed by several others at certain seasons of the year (Walshe, 1940). Instances of bilateral, recurrent, hereditary, or even familial peripheral facial paralysis seem to support the idea of a predisposing factor (anatomical or otherwise). On the other hand, the facial nerve seems to be just as susceptible to toxic and infective conditions as to the common draught. Such conditions may be general—for example, polyneuritis—or local, such as tetanus.

When Ramsay Hunt (1907) described herpetic involvement of the geniculate ganglion of the facial nerve he focused attention on the virus of herpes zoster as a possible cause of Bell's palsy. In the syndrome which now bears his name we find the combination of peripheral facial paralysis and a herpetic eruption in and around the external auditory meatus of the same side. Vesicles may also be present on the pillars of the fauces and the anterior two-thirds of the tongue on that side. The subject usually complains of pain in the ear, herpetic vesicles make their appearance, and facial paralysis follows in a few days. This sequence is not constant, and the condition may be ushered in with a painless facial paralysis. The small size and the transient nature of many vesicles, and their frequently hidden position in the meatus, make geniculate zoster a condition easily missed. The eruption may precede the paralysis by a week or more, and many cases must then be labelled Bell's palsy. The obvious question that arises is whether Bell's palsy is ever due to invasion of the geniculate ganglion by the zoster virus. It is not difficult to imagine geniculate zoster without the cutaneous eruption. Aitken and Brain (1933) were able to demonstrate by complement-fixation tests that in the blood serum of patients with geniculate zoster there were antibodies to the zoster virus. The sera of twenty-two cases of Bell's palsy were found to contain zoster antibodies in only four instances. Serological evidence therefore points to zoster infection as a probable though uncommon cause of Bell's palsy. It is thus of interest to record a recent clinical experience which supports this view.

In March, 1940, a number of cases of herpes zoster were encountered. They occurred in crops of two, three, or four at a time, presented no unusual features (with one exception), and ceased to appear at the end of the month. In all there were perhaps twenty cases; probably others occurred but were not seen. That these cases represented a small epidemic is supported by their rarity during other months of that year. Many men were but mildly affected and did not take to bed. A few, however, showed general disturbance, with a profuse painful eruption, and were admitted to hospital. In one ward, at one time, there were five such cases.

Case Reports

Case 1. Herpes Zoster involving Th. 9 Segment on Left Side.—The illness was ushered in with headache, malaise, and a bout of sickness four days before admission. Burning pricking pain in the skin of the affected segment followed, and a typical herpetiform rash subsequently developed. During the acute stage there was pyrexia of 101°, but this subsided to normal in three days. There was no glandular enlargement: a white cell count was normal (8,700 cells per c.mm.), but there was a slight lymphocytic reaction in the cerebrospinal fluid (15 lymphocytes per c.mm.); the protein content was normal (25 mg. per 100 c.cm.). Pituitrin injections were ineffective. Recovery was uneventful.

Case 2. Herpes Zoster affecting Th. 7 and 8 Segments on Left Side.—Anorexia, lassitude, and pyrexia (100°) preceded the onset of neuralgia and the appearance of the rash by three or four days. The latter was profuse, and much pain was experienced for a time. Lumbar puncture was not done. There were no enlarged glands. Pituitrin was without effect.

Case 3. Herpes Zoster involving L. 1 and 2 Segments on Right Side.—In this case the rash was rather late in appearing. The patient experienced severe pains and dysaesthesiae for a week before its arrival. A diagnosis was made of meralgia paraesthetica before the vesicles were detected. There was a curious frequency of micturition, with pyrexia (99°), shivering attacks, and discomfort over the bladder. The urine was normal on several examinations, however, and cultures were negative. The remote possibility of vesical herpes zoster was considered. At first the rash was practically confined to the first lumbar segment, but later it spread to involve the adjacent area below. A normal cerebrospinal fluid was found and there were a few painless glands in the inguinal regions. Pituitrin was not beneficial.

Case 4. Herpes Zoster involving Th. 6 Segment on Left Side.—This patient, who came from the same unit as Case 3, developed pain, pyrexia (99°), and a rash one day before admission. The vesicles were sparse, but there was much neuralgia and cutaneous hyperaesthesia. Three days after the rash had appeared it would have been impossible to recognize the true nature of the eruption, which could well have been missed and the condition labelled "intercostal neuralgia." Lumbar puncture revealed a normal fluid. Pituitrin apparently reduced the pain and discomfort.

Case 5. Herpes Zoster of the Trigeminal Nerve with Ipsilateral Facial Paralysis.—This patient, aged 24, was admitted to hospital with a history of severe pain in the left side of the face for three or four days. A profuse herpetiform rash developed during the night before admission. Within twenty-four hours numerous large coalescing blisters were clustered over the lower half of the left side of the face. There was much redness, swelling, and oedema of the tissues, with a brisk general reaction. The temperature remained at 100° for forty-eight hours and malaise and anorexia were marked. The vesicles were distributed over the areas supplied by the maxillary and mandibular divisions of the trigeminal nerve; a few were clustered together on the lower eyelid, and others on the chin just crossed the midline. There were no vesicles or other form of eruption in the auricular zone. The tympanic membrane, external auditory canal and meatus, concha, tragus, antitragus, helix and fossa, and posterior surface of the lobe of the ear were entirely normal. There was no earache throughout the course of the illness. In the area of the ophthalmic division no eruption appeared, but tactile and painful sensations were diminished. This was especially marked in the supra-orbital and nasociliary areas. Owing to the profuse rash it was impossible to be certain whether there was any sensory change over the areas subserved by the second and third divisions of the fifth nerve. Later in the illness tactile and painful sensations were diminished. The corneal reflex was almost absent, but a feeble conjunctival response persisted. The mucous membranes of the cheek, lips, gums, tongue, and fauces were normal. The sensation of taste was normal and there was no weakness of masseter or temporal muscles.

On the morning of the fifth day in hospital, when pain had subsided and the rash was drying up, the patient awoke with a complete peripheral facial paralysis on the left side. There had been no earache and the ear was normal. The mucous membranes of the mouth were still healthy. The sense of taste, however, was almost completely absent over the anterior half of the tongue on the left side. The patient was unaware

of this hemiageusia. Blunting of sensation over the left side of the forehead and cheek was still present. He remained in hospital for several weeks and made a complete recovery. The sensory changes persisted for a few more days: the hemiageusia disappeared between the nineteenth and twenty-third days of the illness, while the facial paralysis had practically gone three weeks after its appearance.

Case 6.—While the above five cases of herpes zoster were in hospital I saw a case of Bell's palsy in the out-patient department. It was a typical peripheral facial paralysis in all respects and there had been no pain or rash or general reaction. The man made a good recovery within a month He was employed in the same unit as the first patient (Case 1), and I learned that there had been two or three other instances of herpetic eruption there. Cases 2, 3, and 4 came from separate units, but their quarters were adjacent. I saw several other cases of herpes zoster from the same unit as Case 5. The observation of Case 6 during the height of the epidemic becomes significant when it is stated that only two instances of Bell's palsy have been seen at this hospital during the past twelve months. The second occurred in September, 1940

Commentary

The first interesting feature of these cases was the development in one of them, on the eighth day, of an ipsilateral facial paralysis. The herpetic eruption was confined to the second and third divisions of the trigeminal nerve, but there was diminished sensation to touch and pain over the first division. *No auricular zoster developed* Undoubtedly, then, the herpes virus had invaded both the Gasserian and geniculate ganglia. The former resulted in the facial eruption and the latter in the facial paralysis. Whether these manifestations appeared in order of the involvement of these structures can only be surmised. We do not know what interval elapses between the time of infection of the ganglion cells and the appearance of the rash, but it is quite possible the virus attacked the geniculate from the Gasserian ganglion by way of the superior superficial petrosal nerve. It was not until the infection reached the cell stations in the geniculate ganglion of the fibres of the chorda tympani nerve that taste was affected.

The absence of auricular herpes is especially interesting. It indicates that herpetic invasion of the geniculate ganglion can take place without any cutaneous manifestation in the distribution of its sensory fibres. Facial palsy may be the only sign. Hemiageusia would probably be a more frequent sign in facial paralysis due to geniculate ganglionitis than in that due to a lesion arising at the stylomastoid foramen.

Another interesting feature was the isolated occurrence in the same unit as one of the herpes zoster patients of a typical Bell's palsy; this suggests a common aetiological agent. The possibility of coincidence cannot, of course, be denied, but it remains that this case of Bell's palsy was the only one observed at the hospital for a period of nine months. When considered in the light of Case 5—in which zoster and facial paralysis were present simultaneously—the suggestion of a virus origin of Bell's palsy becomes highly probable.

Such findings suggest the possibility of analogous lesions in other sensory nerves. The abortive nature of the rash in Case 4 brought to mind the condition of intercostal neuralgia, and the lumbar neuritis in Case 3 suggested a diagnosis of meralgia paraesthetica during the week preceding the rash. Some cases of facial neuralgia may be due to herpetic Gasserian ganglionitis.

Summary

In a small outbreak of herpes zoster one case of combined trigeminal and geniculate zoster was encountered. It was characterized by facial herpes and an ipsilateral facial palsy. The former preceded the latter by five days. No auricular or faucial herpes developed. Facial paralysis and hemiageusia were the only signs of geniculate involvement. During this zoster epidemic there occurred the only instance of Bell's palsy seen at the hospital for a period of nine months. The patient came from the same unit as one of the zoster cases.

This evidence supports the view that some cases of Bell's palsy are due to herpetic infection of the geniculate ganglion.

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AN OUTBREAK OF TRICHINIASIS IN WOLVERHAMPTON AND DISTRICT

A CLINICAL ACCOUNT OF SEVEN CASES

BY

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Acute trichiniasis is produced by the embryos of *Trichinella spiralis* during their migrations from the human intestine to the voluntary muscles, and, though extremely rare in Great Britain, the disease is not uncommon in America and Germany. The life history of the parasite is adequately described in the standard textbooks, and, as is well known to medical practitioners and students, infection in man is acquired by eating raw or undercooked pork. The clinical features of the cases described in this article were distinctly unusual and caused some difficulty in diagnosis. Nephritis, pneumonia, renal damage, influenza, pyrexia of unknown origin, suspected enteric fever, and pyelitis were the conclusions arrived at before admission of the patients to New Cross Hospital.

The predominating signs and symptoms consisted of oedema of the eyelids, headaches, conjunctival haemorrhage or injection, mental torpor with lethargy, drowsiness, confusion, and slowed cerebration, heaviness in the limbs, generalized aches and pains, muscular tenderness and stiffness, disturbances of reflex action, paresis, and severe constipation. Vomiting occurred at the outset in two cases and colic in one. My colleagues and I were aware that we were confronted with a distinct clinical entity which was hitherto unknown to us. Blood urea investigations were carried out in the early cases and yielded results which fell well within normal limits. Examination of the blood was next decided upon, and the presence of eosinophilia was discovered. The patients were then seen in consultation with Dr. J. H. Sheldon, consulting physician to New Cross Hospital, who put forward a tentative diagnosis of trichiniasis.* Clinically this disease is generally described in three stages in accordance with the life history of the parasite. Carmichael Low and Hamilton Fairley (1933) state that for the first week during the invasion period gastro-intestinal symptoms develop, with nausea, vomiting, colic, and diarrhoea with perhaps blood and mucus; then when migration of larvae begins myositis of the tongue, laryngeal, and intercostal muscles, and the diaphragm occurs, giving rise to difficulty of swallowing, speech, and respiration. The muscles of the jaws, arms, legs, and abdomen may also be involved, with stiffness and pain: the affected areas are extremely tender and hard to the touch. Oedema, especially of the face, urticaria, leucocytosis with high eosinophilia, prolonged remittent fever (102° to 104° F.), and sweating are said to be characteristic. Cachexia and subcutaneous oedema

* A preliminary account of the present epidemic is given by Dr. Sheldon in the current issue of the *Lancet* (February 15).

and finally, during the period of larval encystment, death may take place from toxaemia, with respiratory disturbance and coma. The fact that many of these symptoms were not shown by the patients under consideration threw doubt upon the diagnosis, and the high incidence of the disease in women also caused suspicions to be directed elsewhere for a time. However, on January 24 biopsy of the pectoral muscle was performed, and the diagnosis was established by the identification of the coiled-up embryos of *Trichinella spiralis* in the characteristic lemon-shaped areas. There was little or no capsule formation, and Dr. Paul B. Beeson of Harvard, who was shown the specimen and confirmed the diagnosis, was of the opinion that the parasite had only just reached the muscle. On January 27 further confirmation was obtained when another successful biopsy was performed.

Case I

A previously healthy 21-year-old married woman noticed puffiness of her eyelids on waking on the morning of December 22, 1940. On the same day she developed severe temporal headache and pain in the left loin. The temperature was normal; there was no cough and no diarrhoea. Vomiting occurred once daily from December 23 to 25 inclusive, and aching pains in the limbs supervened during the same period. Insomnia was present on December 25 and 26. The swelling of the eyelids and the aching pains in the limbs persisted, and she was admitted to hospital on December 28.

Examination showed marked puffiness and swelling of the eyelids and injection of the conjunctival vessels, and the facies was that of a woman twice her age. The only other abnormal physical signs present were a few crepitations in the left lung. There were no abnormal constituents in her urine; the blood pressure was 126/84, the temperature 99°, the pulse 104, and the respirations 24; the blood urea was 37 mg. per 100 c.cm. The mental attitude was distinctly unusual; she complained of feeling "all fuddled," took no interest in her surroundings, and felt very miserable. She showed signs of impairment of memory, and appeared to be dazed and somewhat confused.

Gradual improvement took place, and she was discharged from hospital on January 11, 1941, free from symptoms.

Case II

A housewife aged 36 years developed severe headache, backache, and pains in the left groin on the morning of December 19, 1940. During the afternoon of the same day she observed that her eyelids and the upper part of her face were becoming puffy and swollen. The swelling of the eyelids continued to increase slowly, and aching pains appeared in the limbs and neck on December 21, when the arms felt too heavy to lift, and all her muscles ached to a severe degree even when moving. In spite of her illness she left home to do some shopping, and on returning home in a low-spirited and depressed condition the severity of the headache and backache together with the tiredness of the limbs was such as to cause her to drop into a chair in a fainting condition. There was no history of diarrhoea.

On admission to hospital on December 22 the patient appeared to be in a state of abject misery, was obviously ill, and had extensive swelling and puffiness of the eyelids together with conjunctival haemorrhages. The oedema of the eyelids was sufficient to interfere with vision, and she was unable to see a coin placed in her hand; the temperature was 100°, the pulse rate 120, and the respirations 24. Areas of tenderness were present in both loins, in the back, and to a less extent in the abdomen. Stiffness of the neck, which was most noticeable when she sat up, occurred on December 22 and lasted for three days. Vomiting was present on the second and fourth days after admission; the urine was normal and the blood pressure was 160/110. The patient's mental attitude was abnormal; there were evidences of confusion and slowed cerebration, and when addressed she had to think for some time before she was able to understand what was required of her.

During the night of December 26 loss of power in the left leg supervened, and next morning this limb could not be moved, being described by the patient as heavy and numb. This paresis persisted for twenty-four hours, after which gradual improvement took place. The knee-jerks and ankle-jerks were present; the left plantar reflex was practically absent, and the right easily flexor.

Constipation was pronounced and insomnia troublesome during the first week in hospital. The blood urea was 33 mg. per 100 c.cm. and the urea-clearance factor 88% of normal. Discharge from hospital took place on January 11, 1941, when the patient was free from symptoms.

Case III

A married woman aged 29 years became ill on December 22, 1940, the initial symptoms being supra-orbital headache and swelling of the eyelids. She sought medical advice and was thought to have nephritis. On December 24 the swelling of the eyelids became much worse—the face and forehead were affected; the head felt much larger than normal, and headache assumed a violent character. Abdominal aches and pains next developed; there was no vomiting and no diarrhoea, and the urine was stated to be scanty and dark in colour.

On admission to hospital on December 25 pronounced oedema of the face, eyelids, and frontal area of the scalp, together with chemosis and conjunctival haemorrhages, was noted. The temperature was 102°, the pulse rate 120, and respirations 24; stiffness of the neck and some muscular tenderness were also present. The urine, which was normal on admission, contained a large amount of albumin on December 28 and 29, and albuminuria reappeared on January 1, persisting for six days.

Loss of power in the left arm and to a less extent in the right supervened on December 29, and this paresis, which was not a true paralysis, persisted for three days. During mealtimes, while using a fork, evidence of true incoordination in the left arm was noted. Drowsiness and lethargy developed on December 31, cerebration became slow, the memory was impaired, and mental confusion existed; finding everything an effort, the patient felt miserable. This state of mental torpor continued for four days, during which time she did not recognize her husband and showed a complete lack of interest in her surroundings. Low pyrexia of an irregular type continued for eleven days, and severe constipation necessitated enemata and aperients. The urea-clearance test showed the blood urea to be 40 mg. per 100 c.cm., and the urea-clearance factor was 100% of normal.

Convalescence was gradual, and the patient was discharged on January 14, 1941, free from symptoms.

Case IV

A housewife aged 36 years had a cold in the head on December 16, 1940, and three days later sought medical advice on account of swelling of her face, eyes, and lips. Violent headache set in simultaneously, being accompanied by severe pains in the lower abdomen, most pronounced in the left iliac region. Retention of urine and complete constipation occurred on December 19 and 20. Weakness of the left hand appeared on the third day of her illness; there was no history of diarrhoea.

On admission the clinical picture was that of uraemia: drowsiness and lethargy were extremely well marked; inability to sit up in bed existed for two days after admission; slight oedema of the upper part of the face and eyelids was still visible; and retention of urine, lasting for four days, was present, catheterization being necessary. The urine contained a trace of albumin, which disappeared in the course of a few days; the blood pressure was 104/90, and severe constipation called for treatment.

There was paresis of the left hand; the grip was weak, incoordination was detected by the finger-nose test, and with the exception of the biceps-jerk all the left arm reflexes were absent. The right arm reflexes were sluggish, both knee-jerks were practically absent, and the plantar reflexes were flexor. No muscle tenderness was elicited, and there was no disturbance of joint sense. The blood urea was 46 mg. per 100 c.cm., and the urea-clearance factor 160% of normal.

Convalescence was uninterrupted, and the patient returned home on January 15, 1941.

Case V

A housewife aged 37 years complained of severe headache, giddiness, and swelling of the eyelids on December 14, 1940. Heaviness of the legs developed at the outset of the illness; they seemed to droop when attempts were made to raise them, and felt as if they were made of lead. To a minor extent similar sensations were experienced in both arms. Oedema of the eyelids persisted for some time, and on December 18 was remarked upon by a relative. Vomiting started on December 20 and ceased on December 24; pyrexia, sweats, and loss of memory were present, but no abdominal pains and no diarrhoea.

On admission to hospital on December 28 the clinical picture was that of tuberculous meningitis; some degree of coma, with signs of meningeal irritation, cervical rigidity, and slight head retractions, was noted. At intervals the patient gave vent to a peculiar high-pitched piercing "meningeal" cry, of which she was conscious. Kernig's sign was positive on both sides; the right plantar reflex gave an extensor response, whereas the left was flexor; the abdominal and ankle reflexes were absent, the knee-jerks practically so, and examination of the optic disks revealed slight papilloedema. The skin was moist, the face puffy, and incontinence was present.

Lumbar puncture revealed clear colourless fluid, very scanty lymphocytes only in films—1 cell per c.mm.—chlorides 710 mg. and protein 10 mg. per 100 c.cm., and globulin within normal limits. The temperature was 101°, the pulse rate 120, respirations 26, the blood pressure 100/80, and the blood urea 35 mg. per 100 c.cm.; the urine contained no abnormal constituents. The hands and legs became oedematous on December 29, and three days later considerable muscle tenderness was present, pinching of the calves causing the patient to flinch even though she was incapable of answering questions. Both plantar reflexes were now extensor; the legs were drawn up, and she appeared to be gravely ill. This stage of meningeal irritation passed off gradually; control of the sphincters was regained on January 4, 1941, but drowsiness and lethargy remained for a time.

Examination on January 9 revealed no nystagmus; the disks were normal, and the pupils equal and reacting; the arm muscles were feeble and all reflexes absent, and there was a gross incoordination of the arms with severe dysdiadokokinesia, suggesting a cerebellar lesion. Joint sense was normal in the arms but absent in the legs; the knee-jerks were sluggish and the ankle-jerks were absent; the left plantar reflex was flexor and the right plantar reflex doubtful. The heel–shin test was badly executed and the abdominal reflexes were absent. Constipation was extremely troublesome in spite of aperients and enemata.

By January 16 the patient was greatly improved and her mentality was normal; muscle power in the arms was normal, but there was still incoordination in the right arm; oedema of the left foot and leg was present, the knee-jerks were sluggish, and the plantar reflexes were flexor. A week later constipation still persisted and some degree of faecal impaction occurred; there was considerable loss of postural tone on holding the arms outstretched, and gross incoordination of the right arm with some degree of dysdiadokokinesia; the arm reflexes were slightly increased, and all others were normal. On January 24 biopsy revealed the presence of the embryos of *Trichinella spiralis*. Atrophy of the extensor muscles of the right thigh and calf muscles was noted on January 29; nystagmus was also present for the first time. The patient was unsteady when she sat up and appeared to have some degree of ataxia, which, together with other findings, suggested a cerebellar lesion.

Case VI

A 36-year-old labourer became ill on January 4, 1941, with severe persistent headache and irritability. He avoided conversation with others, resented being disturbed, and retired to bed on account of general weakness. On the 9th he was told that his face was swollen, and next morning he complained of heaviness of his right leg, which was swollen and puffy. Drowsiness supervened and an attack of acute gastro-enteritis lasting for twenty-four hours ensued.

On admission to hospital on January 14 difficulty was experienced in obtaining an accurate history owing to the mental torpor which existed; cerebration was slow, the memory was impaired, and the patient, who appeared to be somewhat bewildered, wore a strange and puzzled expression. He was lethargic, drowsy, disoriented, and his speech was rambling in character. Haemorrhages into the distal end of the finger-nail beds taking the form of crescentic bands of ecchymosis were noted, together with conjunctival haemorrhages and oedema of the eyelids and the right leg. The temperature was 101.4°, the pulse rate 112, and respirations 20; the urine contained abundant albumin, and muscle tenderness was detected in the arms, calves, shoulders, and the right intercostal spaces. Good muscle power was present in both arms, some incoordination of the right arm was shown by the finger–nose test, and with the exception of the right biceps-jerk all arm reflexes were absent. The knee-jerks were sluggish, the plantar reflexes normal, and the muscle–joint sense was somewhat impaired in both legs. The heel–knee test revealed slight incoordination in the right leg, and Kernig's sign was positive on both sides.

Lumbar puncture revealed colourless fluid, scanty lymphocytes in films—1 cell per c.mm.—chlorides 700 mg. and protein 20 mg. per 100 c.cm., and globulin within normal limits. A search for the larvae of *Trichinella spiralis* in the cerebrospinal fluid was unsuccessful. During the first week in hospital constipation was marked and the tongue was dry; the mental confusion continued, the headache gradually diminished, and the mild pyrexia subsided; urinary incontinence occurred on two occasions. Biopsy of the pectoral muscle was performed under local anaesthesia on January 27 and the coiled-up embryos of *Trichinella spiralis* were identified.

Case VII

On January 18, 1941, a married woman aged 36 years was seized with pain in the right loin which travelled into the right side of the abdomen and then became generalized. The pain persisted, and vomiting occurred on January 20 and continued. On the next day severe supra-orbital headache developed, accompanied by knife-like pains down both sides of the face; the face became slightly swollen, leg pains appeared, but there was no diarrhoea. She was admitted to hospital on January 23, and was said to be suffering from pyelitis.

The temperature was 102°, pulse rate 120, respirations 18, and there was pronounced tenderness, with some degree of resistance, in the right loin and lower abdomen. Slight oedema of the eyelids and mild injection of the conjunctival vessels were observed: muscle tenderness was present in the calves and shoulders, but there was no paresis. Leg reflexes were normal, but all the arm reflexes were diminished. The urine contained a trace of albumin, a few pus cells, and very scanty *B. coli*: these findings did not appear sufficient to account for the illness, and questioning failed to elicit any urinary symptoms. Puffiness of the eyelids and conjunctivae became more marked during the first two days in hospital, and the temperature returned to normal by lysis four days after admission. The leucocyte count revealed an eosinophilia of 24%.

Table enumerating the Leucocytes

Case	Date	White Cells per c.mm.	Polymorphs %	Lymphocytes %	Eosinophils %	Monocytes %	Basophils %
I	31 12 40	5,200	63	25	8	3	
	9 1 41	9,600	64	25	7	4	
II	31 12 40	14,800	73	13	11	3	
	9 1 41	11,600	73	19	8		
III	30 12 40	19,400	85	12	2	1	
	9 1 41	6,100	57	39	1	3	
IV	31 12 40	12,000	79	14	7		
	9 1 41	12,400	68	27	3	2	
V	30 12 40	11,800	84	12	3	1	
	9 1 41	9,200	70	20	9	1	
VI	23 1 41	15,000	43	22	33	1	1
	15 1 41	16,400	43	6	49	2	
VII	27 1 41	11,600	74	16	5	3	2
	27 1 41	12,000	61	13	24	2	

Summary and Conclusions

Seven cases of acute trichiniasis presenting atypical features have been described and attention has been drawn to the manner in which this disease may simulate nephritis,

uraemia, tuberculous meningitis, and pyelitis. The outstanding symptom in all cases was oedema of the eyelids, and this, in conjunction with the presence of eosinophilia, may be regarded as diagnostic. The abnormal mental state appears to have been inadequately described in the past, and is worthy of special note. Haemorrhages into the conjunctivae and nail-beds constitute strong supporting evidence, and these signs appear to be attributable to larval embolism. Definite indications of involvement of the central nervous system were observed, and in one case the clinical signs suggested a cerebellar lesion, possibly also of embolic origin. Muscle tenderness was present in most cases, and a surprising feature was the existence of constipation, which was exceedingly troublesome and resulted in faecal impaction on one occasion.

I desire to express my thanks to Dr. J. H. Sheldon, consulting physician, New Cross Hospital, Wolverhampton, for his co-operation and help; to the resident medical officers for their clinical assistance; and to Mr. K. R. Vasey.

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TRICHINIASIS IN HERTFORDSHIRE

BY

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The following brief account of some cases of trichiniasis recently diagnosed in Harpenden, Herts, may be of service to others called upon to recognize this disease.

Information that trichiniasis had appeared in this country reached one of us on February 1; in the practice of the other there had been several cases presenting unusual features, of which the most arresting was oedema about the eyes. A connexion between these facts was suspected, and blood films from two of the cases were examined forthwith. Each showed an extreme eosinophilia. Five typical cases were then investigated further. Their clinical histories are as follows:

Case Histories

Case 1.—Female aged 44. Had been feeling ill for three days before January 23, when she first noticed puffiness of the eyes and had general muscular pains; she also complained of severe temporal headache. On January 24 her temperature was 101° and her pulse 100; she had a harsh barking cough and marked oedema of the eyelids. Physical examination revealed nothing else abnormal, and there was no albuminuria. Fever of 99° to 101.6° has now persisted for sixteen days: muscular pain, chiefly affecting the calves of the legs, neck, and shoulder girdle, is now diminishing. She also complains of vague abdominal discomfort, sometimes amounting to pain.

Case 2.—Male aged 36. Onset on January 21 with swelling of the eyelids and face, temporal headache, and pain, particularly in forearms and legs. No abnormal physical signs except muscular tenderness; no albuminuria. Fever persisted for three or four days, muscular pain for about ten days, accompanied later in the forearms by oedema. Recovery complete in a fortnight.

Case 3.—Female aged 34, the wife of the foregoing patient. Had an illness with identical features at the same time, but was less ill; continued her ordinary life, and was neither examined nor treated.

Case 4.—Male aged 53. Onset on January 31, with oedema of the eyelids; no headache and no muscular pain. On February 1, temperature 100°, well-marked oedema of the eyelids; physical examination otherwise negative; no albuminuria. Temperature since has varied between 99.6° and 101.6°, and some muscular stiffness and a feeling of ill-being have developed: this attack has now lasted eight days and continues.

Case 5.—Female aged 44. Had a headache for two days before January 21, when her eyes became puffy and she had pain in the muscles of the neck, arms, and legs, and some vague abdominal discomfort. First seen on January 23, when she had a temperature of 100° and marked oedema of the eyelids. Physical examination negative; no albuminuria. Pain and a feeling of ill-being lasted for ten days, by which time the oedema had also nearly subsided. She was quite well within a fortnight.

Pathological Investigations.—Differential leucocyte counts gave the following results:

	No. of Days since Onset	W.B.C. per c.mm.	Percentage of Eosinophils	Eosinophils per c.mm.
Case 1 ..	12	13,400	28	3,752
Case 2 ..	14	8,000	27	2,160
Case 3 ..	14	11,600	27.5	3,190
Case 4 ..	5	12,000	31	3,720
Case 5 ..	14	17,800	47	8,366

There was thus a pronounced eosinophilia in all cases, although in one the duration of the disease had been only five days, and in three the attack had been brief and was clinically over when the counts were made.

Muscle biopsy was performed in three cases, small pieces of the deltoid being removed for us under local anaesthesia by Mr. Michael Harmer, whose help we gratefully acknowledge. In Cases 2 and 5 no embryos were present, but a single coiled embryo lying among the fibres was discovered in the specimen from Case 1. These examinations were made on the same day of the disease as the blood counts.

In Case 4, the most recent, two stools passed after 4 grains of calomel were examined for adult worms with no result, and in 10 c.cm. of blood lysed in an excess of distilled water and centrifuged no embryos were found.

Dietetic History.—All these patients could recollect having eaten sausages during the fortnight preceding the onset of their illness. Two of them had been in Birmingham and one in London during this period, and might have acquired the disease there; but its local origin is certain in Case 5—this patient having had no meals away from home—and particularly in Case 3, which patient had not only been continuously at home but had admitted having eaten two locally bought sausages *raw* on or about January 14. Her husband, Case 2, ate four of the same sausages cooked.

Other Cases.—One of us (D. M.) has seen several similar cases, all during the last three weeks of January, in which no laboratory investigations were made. We mention in passing that one of these patients gave blood for transfusion on the day before his illness became noticeable: the number of embryos so transmitted would be small, but it should presumably be recognized as inadvisable that anyone suspected of having trichiniasis should act as a blood donor. It is not assumed that these were necessarily cases of the disease, and, indeed, we have reason for believing that the features of mild trichiniasis may be imitated by some other condition. A man complaining of fever and headache, who three days later developed conjunctival oedema but no muscular pain or other complaint, had an eosinophil count of only 132 per c.mm. on the sixth day after the onset. He had eaten sausages on several occasions, and his may be a case of trichiniasis in which eosinophilia has failed to develop. This explanation is almost impossible in another case under the care of Dr. K. H. C. Hester, to whom we are indebted for permission to mention it. She is a woman aged 48 who has developed marked oedema of the eyelids in association with a febrile illness having no other localizing features except upper respiratory tract catarrh. Not only is her eosinophil count merely 56 per c.mm., but she is a strict vegetarian, and close questioning has brought to light not even the possibility that she might have consumed meat in a sandwich without knowing what it was.

Commentary

The finding of a trichinella embryo establishes the diagnosis in Case 1 and thus proves the existence of the disease in this locality. The other four cases are clinically similar, and all exhibit an eosinophilia of the same order. There is no other febrile disease of such duration in which an eosinophilia of this degree occurs: during a known epidemic an eosinophil count of over 2,000 per c.mm. in any case with the clinical features of trichiniasis is almost certainly diagnostic.

A detailed analysis of the clinical features of so few cases is not called for, but the following points may be noted. The only constant feature is oedema of the eyelids, and maximum stress should be laid upon this in encouraging the search for further cases, although, as we have suggested, this sign should not be taken as pathognomonic. Severe headache localized just above the eyes and quite unrelieved by ordinary sedatives is common, as is a feeling of general ill-being. Muscular pain and tenderness are variable, and were accompanied in only two of these patients by recognizable oedema. Linear subungual haemorrhages were not observed. In no case was there any clear history of gastro-intestinal disturbance preceding the stage of invasion. Three of these cases were very mild, with a duration of little more than a week, and the remaining two, although of longer duration, are of only moderate severity. In such comparatively light infestation the examination of blood and stools for parasites is very likely to be fruitless. The same may be said of muscle biopsy unless the specimen is of adequate size and taken from a carefully chosen site. Out of consideration for patients who submitted to this operation rather in the public interest than for any benefit to themselves, the incisions made were small and the fragment obtained amounted to not more than about 0.1 gramme of muscle. Were we faced again with the need for proving the existence of this disease, we should advocate identifying a point of maximum tenderness, which is usually found near a tendinous insertion, and the excision therefrom of a strip of muscle at least 1 cm. long.

The source of the infested meat which must have been consumed by these patients is not yet known, nor is the distribution of other cases, if any, in the neighbourhood. It is certainly not confined, as we understand it has been elsewhere, mainly to people of the artisan class; on the contrary, none of these five is an insured patient and some of them are well-to-do. The mere fact that trichiniasis exists in a locality so remote from Wolverhampton—the principal area known at the moment to be affected—appears worthy of immediate record, since it strongly suggests that further cases may be recognized elsewhere as soon as their possibility becomes known.

We are indebted for confirmation of the diagnosis by muscle examination to the Institute of Agricultural Parasitology, St. Albans, which is the consulting laboratory for parasitology to the E.M.S.

J. L. Thorner (*Arch. Pediat.*, 1940, **57**, 437) records an abortive attack of measles in a female infant whose mother did not develop measles until nineteen days after delivery. As the mother had been nursing the child not only during the acute stage of the attack but also during convalescence, it was hoped that antibodies had been transferred through the milk, but to insure attenuation 15 c.cm. of whole blood was injected intramuscularly and only an abortive attack of measles ensued. Measles during the first six weeks of life is uncommon, but previous examples have been recorded by Musser (1927), Kohn (1933), Cogne (1924), and Ronaldson (1926).

Clinical Memoranda

Neurological Complications of Serum Therapy

The publication of the article on neurological complications of serum therapy by Drs. Thompson and Tombleson in the *Journal* of June 22, 1940 (p. 1015), prompts me to record my own personal case.

CASE REPORT

On June 3 or 4, 1939, I had a severe attack of dysentery. On the first day microscopical examination of my stools revealed plenty of Charcot-Leyden crystals, but no amoebae or cysts: characteristics of bacillary dysentery stools were not found in it. Moreover, I had had definite amoebic attacks once or twice before. Amoebic infection was diagnosed and injections of emetine hydrochloride were given, but there was no improvement after three 1-grain injections. Further examination of the stools revealed a bacillary infection; cultural examination was not done. Anti-dysenteric serum was then suggested. I generally test a patient's sensitivity to serum by giving him a very small preliminary dose intradermally, and I asked my attending physicians to test me in that way beforehand. The test was done: a little while after the test a big local wheal and very scratchy urticarial rashes broke out all over my body. Seeing that I was hypersensitive I refused to have the serum. During the next two or three days my symptoms did not abate with medicinal treatment and I lost a good deal of blood with stools: consequently it was decided that I must have serum. On June 12 the first dose (20 c.cm.) was injected subcutaneously in my right thigh, the only untoward effects being extensive and itchy rashes all over the body. On the 13th I had another dose of 20 c.cm. No rashes appeared, and I began to show signs of improvement. On the 14th I was practically cured, and felt very well. I went out on the 16th to see an urgent case.

On the 17th extensive rashes again appeared. I took a calcium injection and remained indoors for two days. On the 19th I had to go out to see some cases. Throughout the whole day I felt well, but in the afternoon had some malaise, with stiffness all over the body, just as before an attack of influenza or malaria, and I thought that a little exercise might help to pass it off. During a game of badminton I felt great pain in my back between the shoulder-blades: it radiated over both the shoulders and down the arms and forearms. I had to stop, and went to bed after taking a couple of aspirin tablets. The night passed without much trouble. The next morning I felt better except for some pain in the shoulders and arms. I visited my hospital patients as usual, but suddenly felt an excruciating pain between the shoulder-blades, radiating over both shoulders and down the arms. This completely incapacitated me. I was driven home very slowly and gently, as the slightest jerk aggravated the already excruciating pain to such an extent that I thought I would die before reaching home. A doctor was immediately sent for, and on arrival he gave me 1 ½ grain of morphine, which alleviated the pain slightly. I was confined to bed for three weeks, suffering extreme agony, unrelieved by anything but morphine, which had only a slight and temporary effect. For a few days my temperature rose a little, and I was delirious for many days, mostly at night (a confused state of mind lasted for about six weeks). Within a week of the first appearance of symptoms the muscles around my shoulders, especially of the right—the deltoid, supraspinatus, upper parts of biceps, and triceps—had shrivelled up to such an extent that the right shoulder and the upper part of the right humerus were left covered by mere skin and a few fibres of muscles, which could be felt like strands of thread on the bone. The supinator muscles of the forearm and the first dorsal interosseous of the palm were also more or less shrivelled up. All these muscles of the left arm were affected, but to a much less degree than those of the right. My right arm became completely paralysed, but the left could be moved with difficulty. There were patches of anaesthesia, hyperaesthesia, and paraesthesia on the skin of both the upper limbs. The left vocal cord was also affected. All these paralyses, and the atrophy of the muscles, occurred within a week or ten days. The pain was

intense, with but slight remission from time to time, and I hardly had any sleep for three weeks, during which period I lost nearly 3 stone.

At this stage I was transferred to Calcutta, a distance of 475 miles, for a course of hospital treatment. My pain did not abate for another three weeks, and only morphine gave the slightest relief. At this time cobra venom was tried. The first dose was injected probably on August 1, 1939, and this had a magical effect. Pain abated and I slept straight off for some hours. Thereafter the pain returned off and on, but the severity and duration grew gradually less, and I made an uneventful recovery. I was discharged from hospital by the middle of September, but had electrical treatment and massage for a further month in the out-patient department before returning home. Partial paralysis of both arms and of the vocal cord still persisted when I was discharged. At this time I could raise my arms only up to the shoulders; the atrophied muscles had grown, but were still far from their normal size, and my voice, though much better, was very weak and could be heard only by those near me. At the time of my discharge the specialists said it would be at least six months before my voice was restored (as my left vocal cord was still completely paralysed) and the atrophy and paralyses of my arms would disappear. Here I cannot help mentioning the interesting fact that after my discharge from hospital an ayurvedic practitioner took me in hand, and in less than three weeks my voice was completely restored and my arms got so much better that I could raise them straight to the sides of the head, though with some difficulty; other arm movements still remained restricted.

After nearly fifteen months I still occasionally feel some pain around my right shoulder and arm. A small portion of the posterior part of the right deltoid muscle has not yet fully regenerated, but the movements of the arms are practically normal. A sense of constriction round the right arm (as if a tourniquet was tightly wound round the limb spiral fashion from the shoulder to the finger-tips) and a sense of congestion and actual slight solid oedema of the skin of this arm, which were present from the onset of the disease, still return from time to time.

I may mention that this was the first occasion on which I had been treated with serum.

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Fatal Anuria following Sulphapyridine in Pneumonia

The admission to No. 4 General Hospital, B.E.F., of the case described below occurred shortly before the hurried evacuation of that unit from France, and it is regretted that as a consequence investigations were incomplete and records are deficient. It is felt nevertheless that, in view of its rather unusual nature, an account, however incomplete, may be of some value.

A necessarily brief review of the literature on the subject has produced few comparable cases of complete anuria following the administration of sulphapyridine, though the occurrence of haematuria seems to be not uncommon.

CASE RECORD

A lieutenant aged 42 was admitted to hospital on June 10, 940. He stated that, except for some bronchitis, he had been in good health until a few days previously, when during a train journey from the North of France he developed a pain in the right chest, not apparently severe at first. On the following day he had a severe pain in the right lumbar region lasting for fifteen minutes. On the day before admission the pain in the right chest recurred at frequent intervals, and was accompanied by shortness of breath. His temperature that evening was 100 F. On the morning of the day of admission his temperature was stated to be 99° F., he was short of breath, and he coughed up a small amount of blood-stained sputum.

On admission the patient's temperature was 100° F., the pulse 104, and respirations 24. He was a rather fat flabby man with ruddy complexion, not cyanosed and not very distressed, though respiration was slightly grunting. There were dullness, diminished air entry, and bronchial breathing at the right base behind; the lungs were otherwise clear. The pulse was full, bounding, and regular. It was apparently a case of lobar pneumonia. He was put on sulphapyridine at once—3 grammes at 6 p.m., 2 grammes at 10 p.m., and thereafter 1 gramme four-hourly. He was also ordered half an ounce of whisky every four hours as he admitted to a moderate consumption of alcohol, and his appearance corroborated this. On the following morning his general condition had improved and his temperature was normal, though there had been some vomiting. In the afternoon he complained of severe pain in the lumbar region and passed a small amount of heavily blood-stained urine. The administration of sulphapyridine was stopped at once, a total of 10 grammes having been given, but the loin pain necessitated morphine for its relief. He passed a poor night, but the next morning (June 12) he had no pain and his general condition was good. He had passed no more urine, but the bladder was not palpable. His blood pressure was 170/110 mm. Hg and his fundi showed no changes. Fluids were pushed and citrates administered. Passage of a catheter produced only a drachm of thick bloody urine.

On June 13 he developed pleural friction over the back and front of the right base and had still passed no urine. He had no headache, was mentally clear, and his general condition was still good. Fluids were still being pushed, and potassium citrate was increased to 40 grains every two hours. A hot pack was applied, resulting in profuse sweating, and during the night one pint of 4.2% sodium sulphate was given intravenously, without effect on urinary secretion.

On June 14 a few drops of bloody urine were passed containing a heavy crystalline deposit, which was proved to be composed of acetyl-sulphapyridine. His blood urea was then 155 mg. per 100 c.cm., and his condition was deteriorating. He was seen by Major-General R. Priest, Colonel Stott, and Colonel Max Page, and it was decided that decapsulation of the kidneys offered the only chance of survival.

The operation was performed by Lieut.-Colonel Porritt and Major D'Abreu. On exposure the kidneys were found to be enlarged, lobulated, and oedematous. No calculi were felt. The capsules stripped easily. The pelves were bluish in colour from the contained dark blood-stained grumous urine. A drainage tube was put into the pelvis of the right kidney. Small portions of each kidney were excised for section, but owing to the upheaval of the hurried evacuation it was not possible to complete the examination. The patient was returned to bed and a continuous intravenous drip-transfusion instituted. Practically no urine was passed from the pyelostomy tube, and death occurred at 10 p.m. on June 15.

CONCLUSIONS

In view of the failure of the pyelostomy to promote re-establishment of urinary secretion it is probable that the anuria was due to blockage of the renal tubules themselves and that the procedure of ureteral lavage, successfully carried out by Carroll *et al.* in a case of theirs, would have been useless at the stage at which operation was done. The total amount of sulphapyridine given was small, and the initial dose was no larger than in a number of other cases of pneumonia in which no urinary complications supervened. It is not clear what was the particular factor which induced the copious crystallization of the sulphapyridine in this case, but the unfortunate termination emphasizes the paramount importance of adequate fluid intake during the administration of sulphapyridine in all cases, especially when any suspicion of renal insufficiency exists. It is regrettable that a urine examination was not made on admission here.

Thanks are due to Major-General R. Priest, Colonel Stott, and Colonel Max Page for their most valuable advice, and to Lieut.-Colonel Porritt and Major D'Abreu for their surgical co-operation. I wish also to thank Colonel D. G. Harding, O.C., No. 4 General Hospital, B.E.F., for permission to present this article for publication.

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Resistance to Disease by Dietary

"In young children it is logical to supplement a diet suspected of being deficient by the addition of Vitamin D and calcium salts and even to prescribe these in proper dosage for any child with the hope .... of improving the structure of the teeth to such an extent as to give them a higher resistance to disease."

("Lancet" Editorial, July 16th, 1938, page 147).

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Dental caries
Rickets

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>
> *"The most rapidly acting antiseptics are the "halogens and those liberating nascent oxygen."* —*Lancet, April* 27, 1940.*
>
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Reviews

TREATMENT OF CANCER

Treatment of Cancer and Allied Diseases. Edited by George T. Pack, B.Sc., M.D., F.A.C.S., and Edward M. Livingston, B.Sc., M.D. In three volumes. ($36.00 or £9 the set.) New York and London: Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers.

To describe the treatment of cancer and allied conditions in all its various aspects and in all parts of the body is a task which really merits the use of that overworked adjective "colossal"; nevertheless it has been attempted and carried through in a praiseworthy manner in the books now under review. It is not surprising, therefore, to find that the three large volumes contain some 2,600 pages of matter, while the indexes alone add more than 200 pages to this total.

The general editorship is in the hands of George T. Pack and Edward M. Livingston, and the list of contributors contains 150 names of authors, many of them with international reputations. From such a galaxy we can only pick upon a few for mention, but the following names carry their own significance: Adson, Balfour, Braasch, Broders, Chaoul, Coley, Crile, Ewing, Gwathmey, Handley, Jackson, Lahey, Mayo, Polya, Rankin, Young; yet the other names in this long list are scarcely less imposing. A high general standard of information would naturally be expected from such sources, and a perusal of the various sections shows that our anticipations are justified. It is obviously impossible in a short review to examine each section critically, but mention can be made of a few to indicate the character of the work.

An early chapter on the microscopical grading of cancer affords an excellent opportunity for Broders to explain his investigations on this subject; others on surgical, aspiration, and punch biopsy are full of practical information. Several good chapters are devoted to the general theory and application of radiation therapy in all its forms, including the Chaoul tube on the one hand and the use of very high voltage installations on the other. Quite properly the question of protection in radiotherapy receives adequate attention. Following these discursive sections the rest of the book deals regionally with cancer of the various organs. In each section the description of treatment is comprehensive, and includes surgery, diathermy, irradiation in all its forms, and, where appropriate, other forms of treatment such as Coley's fluid, etc. Even such matters as the prosthetic reconstruction of the face and mouth following cancer therapy are not neglected.

On the whole it seems that the balance between the various methods of attacking cancer in any particular situation is well held, and in the few instances where the authors' opinions do not agree, as is bound to occur in a book of this type, the editors have added some judicial paragraphs to guide the reader. The combined knowledge and skill here represented could not possibly come within the range of one man's ability, but the multiple authorship occasionally leads, despite efficient editing, to a certain amount of overlap. In particular this is noted in the sections on growths of the colon and rectum. There are some 1,500 illustrations, the high quality of which is equalled by the general make-up of the volumes. The publishers as well as the authors are to be congratulated upon their enterprise in producing a notable contribution to the cancer problem, and, provided the matter can from time to time be brought up to date, these volumes should be universally recognized as a standard of reference in this subject for a long period to come.

HANDBOOK OF ANAESTHETICS

Handbook of Anaesthetics. (Formerly Ross and Fairlie.) Fifth edition. Revised by R. J. Minnitt, M.D., D.A. With Chapters on Local and Spinal Anaesthesia by W. Quarry Wood, M.D., Ch.M., F.R.C.S.Ed. (Pp. 364; illustrated. 12s. 6d. net, postage 7d.) Edinburgh: E. and S. Livingstone. 1940.

In his preface to the fifth edition of Ross and Fairlie's *Handbook of Anaesthetics* Dr. R. J. Minnitt drops a broad hint that he means to do a good deal of sweeping before the sixth edition appears but is rather acutely conscious of being a new broom this time. His difficulty is one with which it is easy to sympathize: for he has to bring up to date an elementary textbook (usually more difficult to write than an advanced one) which has achieved a recognized position through the possession of several real and obvious merits. Among these were clear presentation of accurate information, good selection of what must be included and what omitted in a book of limited scope, and good arrangement of material. In the present evidently transitional stage of development it would be better not to offer criticism of things which Dr. Minnitt probably himself realizes are open to it, but to dwell rather on the substantial merits both of what he has inherited from his predecessors and what he has added to it.

Naturally some unevenness of style is observable: many chapters are almost models of well-expressed dogmatic teaching; others are rather full of grammatical solecisms such as "the patient is induced with . . ." (shade of Clifford Allbutt!) when what is meant is "anaesthesia is induced by . . ." The chapter on choice of anaesthetic for various types of case would gain by references to spinal and to local anaesthesia, which are virtually omitted from purview; and it may be suggested also that there are other causes of mechanical obstruction of the airway besides obstructive goitre, oedema of the glottis, and chest affections. Dr. Minnitt knows that well enough, of course, but students reading page 250 might not realize it. It is of no great intrinsic importance that novocain is not spelt with the final "e" which it is regularly given here, but this is a symptom of the rather perfunctory proof-reading which is doubtless on Dr. Minnitt's list of things to be remedied. The book is so valuable that it cannot be very long before "next time" comes about.

FOOD AND DIETETICS

Hutchison's Food and the Principles of Dietetics. Revised by V. H. Mottram, M.A., and George Graham, M.D., F.R.C.P. Ninth edition. (Pp. 648. 21s. net.) London: Edward Arnold and Co. 1940.

The ninth edition of Sir Robert Hutchison's "Food and the Principles of Dietetics" has been edited and extensively revised by Prof. Mottram and Dr. George Graham. Its contents fall into four parts. Part I deals with diet in normal life, and in the space of 184 pages an excellent account is given of the physiology of nutrition. Part II deals with the composition and character of food and beverages, and a vast amount of valuable information will be found in the 260 pages which comprise this section. No greater compliment can be given than to say that the section fully maintains the high standard which has made Hutchison's monograph one of the leading books on diet in this country for the past forty years. There next follows an excellent account of the principles of feeding in infancy and childhood by Dr. C. F. Harris.

The final section is mainly concerned with the dietetic treatment of disease. To the general practitioner this aspect is of particular importance, and he may well be disappointed that the editors should devote less than one-sixth of a book on dietetics to the part played by diet in the treatment of disease. Surely the value and the

limitations of diet in the various types and stages of the chronic rheumatic diseases and diseases of the heart and blood vessels and the liver and biliary tract are worthy of more space than the one or two pages devoted to them. This section does not reach the high standard attained by the rest of the book.

ACTIONS OF DRUGS

Pharmacology. By J. H. Gaddum, Sc.D., M.R.C.S., L.R.C.P. Oxford Medical Publications. (Pp. 407. 17s. 6d. net.) London: Oxford University Press. 1940.

Prof. Gaddum in the preface to his new textbook entitled *Pharmacology* explains that his object has been to present the general principles of the subject in a brief form to medical students. This task is one beset with great difficulties because pharmacology has developed along empirical lines, and in consequence an enormous mass of detailed information has been acquired, whilst general principles are scarce. Furthermore, the medical student is interested in a small number of compounds that have been chosen on account of their therapeutic value and not on account of their general pharmacological interest.

The volume comprises about 400 pages, and the author has dealt with all the chief drugs of therapeutic importance, hence his main problem has been that of selecting the most relevant data and presenting them as clearly and concisely as possible. The difficult problem of demonstrating the relations between different members of groups of compounds has been overcome by the use of ingenious tables which show the variations in structure very concisely and clearly. This method is applied to such groups as the sympathomimetic amines, the phenol derivatives, and the sulphonamide drugs. The volume covers all the important aspects of drug action, and certain sections provide information that is not readily available elsewhere in a concise form; such sections are those dealing with the action of drugs on nerve endings and the principles of biological assay.

The special interest of Prof. Gaddum's book is that it represents an approach to pharmacology from an unusual standpoint, and hence can be recommended not only to students but also to teachers of pharmacology and therapeutics.

CHILD PSYCHOLOGY FOR PROFESSIONAL WORKERS

Child Psychology for Professional Workers. By Florence M. Teagarden, Ph.D., Professor of Psychology, University of Pittsburgh. (Pp. 641. $3.25.) New York: Prentice-Hall, Inc.

Prof. Teagarden has produced a really valuable book. Primarily designed for professional social workers, teachers, and nurses who have to work among children, whether in school, home, or institution, this volume will prove to be a mine of information for anyone interested in the life of the child. Its great merit is that it is centred on the normal and not on the abnormal child, and that the author has succeded in avoiding the worst of the psychological jargon of the present day.

In a comprehensive study such as this much of the information is of necessity second-hand, and this is perhaps noticeable in the writing of the first few chapters, which deal with heredity, birth, and infantile development; but by the time the author reaches the chapters on the pre-school child and his progress through school life she has clearly come within the ambit of her own experience, and the book accordingly comes to life. The chapter in which behaviour difficulties are surveyed is especially good, while those chapters concerned with the effects of various illnesses and sensory and physical defects are adequate if not detailed. Finally, a record of the children's charter as promulgated by President Hoover's White House Conference on Child Health and Protection is given: this might well be used as an ideal by all those concerned with the education of children in its widest sense. Although this book is meant primarily for a non-medical audience, doctors, in whatever branch of the profession they may find themselves, would do well to read it; for if we have any interest in our patients' welfare—which surely we must have—we all must come back to the proper upbringing of the child as the basis of healthy living.

Notes on Books

The latest of several recent popular books on medical microbiology is Dr. JOHN DREW'S *Man, Microbe, and Malady*, which has appeared in the sixpenny Pelican series. It is quite the most systematic and orthodox of its kind, and the inquiring and intelligent laymen will profit much by reading it. The arrangement and choice of subjects almost follow the lines of a regular textbook, but the author maintains interest by the use of simple language and by allowing facts to speak for themselves. The chapter on bacterial warfare is a novelty, and the reader will be relieved to hear that there are grave difficulties in the way of attacking effectively by this means. This is true, but there may be other methods which have not occurred to the author, and it would be rash to predict their failure in advance of any practical trial.

Occupational therapy has not received the attention in this country which it deserves. It is fairly well recognized in mental hospitals, and the few centres which teach it approach it chiefly from the point of view of psychiatry. It has, however, an invaluable scope in the after-treatment of nearly every form of disease. In the rebuilding of mind and spirit which is so necessary after most illnesses the lessons of the mental hospital can be usefully applied. In rehabilitation after orthopaedic injuries occupational therapy is a highly specialized art, for its application differs from limb to limb and even from case to case. Dr. NORAH A. HAWORTH and Miss E. MARY MACDONALD have written the first English textbook on the subject, which has for some years been fruitfully developed in Canada. Their *Theory of Occupational Therapy* (Baillière, Tindall and Cox; 6s.) is intended for students and nurses, and embodies a great deal of practical experience by well-known pioneers. They deal concisely with the treatment of mental patients, sufferers from tuberculosis and cardiac disease, and surgical and orthopaedic cases, and conclude with a practical chapter on finance, equipment, and the ancillary details of the art. The book is copiously illustrated with photographs and line drawings.

Preparations and Appliances

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BRITISH MEDICAL JOURNAL
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TRICHINIASIS IN ENGLAND NOW

Following our editorial warning last week (p. 202) that trichiniasis exists in this country, we publish this week at page 237 an account by J. E. S. Lee of the disease as seen at the present time in Wolverhampton. A description by J. H. Sheldon of the same outbreak appears in the current issue of the *Lancet*. Suspicious cases were first seen in the middle of December last, and soon afterwards some of the more severe were admitted to hospital. The nature of what was evidently a distinct and unfamiliar disease entity was finally determined by the demonstration of *Trichinella spiralis* embryos in a piece of excised muscle. Some 500 cases have occurred in this district, and, although some of them have been severe, there have fortunately been no deaths. The clinical picture departs from the usual description in several ways. During the first week after consuming infected meat vomiting, diarrhoea, and upper abdominal pain are said to be characteristic: in these cases they were often completely absent; according to Sheldon only 10% had vomiting and 5% diarrhoea, the majority being constipated, sometimes severely. The absence of prodromal gastro-intestinal disturbance is therefore not a point against the diagnosis, and symptomatic recognition must depend mainly on the features of the stage of invasion. The first of these is usually swelling of the eyelids, accompanied by severe frontal headache; a few days later involvement of the skeletal muscles usually causes pain, tenderness, and stiffness. These effects are very variable, ranging from complete absence in slight cases to a condition said to be worse than labour pains, and causing such stiffness that patients have said they "might have been plaster statues"; the duration of muscular symptoms also varies from a few days to five weeks. A prominent and unusual feature in this epidemic has been evidence of involvement of the nervous system, and this of several kinds. Some cases present the picture of meningitis, with head retraction, semiconsciousness, irritability, photophobia, a meningeal cry, a positive Kernig sign, and extensor plantar responses. Others are deeply lethargic, depressed, and even deluded. Finally, no fewer than thirteen out of seventy-six cases (17%) described by Sheldon have presented signs of focal cerebral lesions, in the form either of monoplegia or of ataxia. Not only may these nervous manifestations complicate a severe and otherwise typical case, but in some giddiness, weakness, and ataxia have been the first manifestations, even preceding the swollen eyes. The general picture is therefore highly complex, and consideration of trichiniasis may be necessary in the differential diagnosis of a large variety of conditions. Fortunately the true nature of the disease seems to be invariably betrayed within the first few days if not at the very onset by oedema of the eyelids—an absolutely constant sign which in the absence of albuminuria calls for a differential leucocyte count; a marked eosinophilia almost certainly establishes the diagnosis. This blood change may apparently develop late, and was equivocal in degree in some of the cases described by Lee. It would be useful to do repeated counts on a series of cases diagnosed early in order to define more exactly what blood picture is to be expected at each stage. Of the various methods of positive diagnosis by demonstration of the parasite, according to D. L. Augustine,[1] concentration of the blood for embryos and searching the stools for adult worms so often yield no result as to be a waste of time; muscle biopsy may also fail to reveal embryos in a lightly infested case. This author recommends the use of an antigen prepared from embryos both for a skin sensitivity test, which becomes positive during the second week, and a serum precipitin test, first applicable during the fourth week. Since both these reactions persist for a year or more they would serve admirably for ascertaining the full extent of an epidemic during its later stages or even after it is over, as well as for confirming the diagnosis in individual cases. An improved method for preparing the antigen has recently been described by J. Bozicevich.[2]

We also publish a short account by L. P. Garrod and D. MacLean of further cases of trichiniasis which have been diagnosed in Hertfordshire since the existence of the disease in this country became known. This minor but significant incident perhaps illustrates the consequences which may accrue to the public health if E.M.S. laboratories are looked upon not merely as sources of reports on specimens but as consultative centres for epidemiological problems. The extent of the disease in this area is not yet known, but five comparatively mild cases have so far been diagnosed, each presenting a typical clinical picture and having an eosinophil count of over 2,000 per c.mm.: the embryo has been found in muscle from one case. The importance of these few cases lies of course in the fact that they appear unlikely to be connected in any way with the Wolverhampton outbreak, and the recognition of the disease in another area raises the possibility that it may be widespread. It is incumbent on practitioners throughout the country to be on the look-out for cases having these features, and to call in laboratory aid whenever the disease may be suspected.

Until the extent of the disease is fully known it cannot too strongly be urged that all pork and pork products should everywhere be thoroughly cooked. Sausages are chiefly suspect, and it does not seem to be generally known that the meat they contain has usually not been cooked at all, nor are all physicians perhaps aware that eating raw sausage is a common habit. The piece of social research in this connexion described by Sheldon produced astonishing results. As soon as this habit was recognized as a factor in the Wolverhampton outbreak, all patients were asked about it, and of the next fifty-nine seen thirty-seven confessed to it. It was also found to explain the peculiar sex incidence: sixty-two of Sheldon's patients were females and only fourteen males. Apparently working-class women content themselves with raw sausage either because it is a tasty and portable lunch to take to a

[1] *New Engl. J. Med.*, 1937, 215, 453.
[2] *Pub. Hlth. Rep., Wash.*, 1938, 53, 2152.

factory, or, if they are married, because housework leaves them no time or inclination to prepare a proper meal; their husbands, on the other hand, expect things to be cooked for them. A warning against the dangerous practice of eating raw sausage should be sounded throughout the length and breadth of the land.

OVERHAULING ASEPTIC TECHNIQUE

At a congress of the American College of Surgeons held in October, 1939, the proceedings of which have only recently been reported,[1] post-operative infections and the measures by which they can be prevented were discussed from almost every possible point of view. The mere fact that this subject was chosen for so prolonged a debate acknowledges that perfection in aseptic technique has not been generally reached; what was said on some aspects of it suggests rather there is much room for improvement. This report forms an interesting corollary to the paper by Prof. A. A. Miles and his colleagues which we published a few weeks ago,[2] for both deal with different aspects of the same subject. The study initiated by the War Wounds Committee of the Medical Research Council has developed on lines which have shown that much preventable infection in wounds is due to imperfections in ward technique; it is suggested that if precautions usually taken in operating theatres were also observed in ward work the transmission of infection could be prevented. The American report, on the other hand, deals almost exclusively with theatre technique itself—that aspect of surgery which should be a model for all other proceedings undertaken in its name. Let us grant at once that theatre infections are far less common than those acquired in septic wards; the problem is not of the same magnitude. But what it does amount to can only be ascertained by accurate record-keeping, and when such a system was introduced in 1925 at the Presbyterian Hospital, New York, it was found that the frequency of post-operative wound infections was no less than 14% of all cases, 4% being serious and 10% trivial. These records have been carefully kept since then; cases have been reported weekly to the staff conference, and changes made in aseptic technique to eliminate the apparent source of infection. The incidence of infections has declined steadily, and amounted in 1939 to only 0.6% classified as serious and 2.6% as trivial.

Among measures for minimizing contamination of the wound the first recommendation made at this congress was the use of an efficient mask, which is now well known to mean one containing an impermeable layer of some such material as cellophane. Current American opinion that the air is the source of staphylococcal wound infection is reflected in several communications on the use of ultra-violet light for air sterilization; but glove perforations are not forgotten, and it is recommended both that small punctures should be more carefully looked for and that a record be kept of the numbers produced by each surgeon, with a view to persuading the chief sinners to take greater care. The patient's own skin is another possible source of wound infection, and pre-operative skin disinfection comes in for discussion here; but the recommendations made are simple and would lead no uninstructed reader to suppose that methods favoured for this purpose are legion. It is laid down that preliminary cleansing with liquid soap followed by ether and alcohol and the application of a sterile dressing should take place in the ward; for the further swabbing with ether and alcohol carried out in the theatre before the application of a mercurial or dye antiseptic minute directions are given for wiping towards the periphery in order not to transfer bacteria from the unsterile edge of the operative area to the line of incision in its centre. How important such details may be must be left to individual judgment, but it scarcely needs to be said that nothing like this amount of care is always taken over this proceeding.

"Supposedly sterile materials" are the final source of danger dealt with at this congress. Catgut, of course, has always been a problem, but the absolute and invariable sterility of instruments and of fabrics such as towels and dressings is a fundamental condition of successful surgery. It is usually assumed with confidence. Is this confidence always justified? The most detailed report in these proceedings deals with steam disinfection: it condemns the use of metal drums, and condemns the vacuum displacement of air, thereby classing as potentially inefficient probably nine-tenths of steam sterilization in theatre practice in this country. Gravity air clearance, a horizontal path for air escape, and a thermometer at the outlet which must read 250° F. before sterilization is considered to have begun are laid down as essentials. The sterilization of instruments is the subject of a paper which begins by recording the answers to a questionary on this subject sent to 207 leading hospitals in all parts of the U.S.A., producing 106 replies. The variety of practice revealed in these replies is astonishing. No fewer than sixteen different methods are used, with variations. Boiling for various periods in either water or a solution of soda and autoclaving at various pressures (temperature not being mentioned) are the most popular. Other methods of applying heat are immersion in oil at 250° F. and a hot-air oven at 170° C., which have ten advocates and one respectively. Alcohol alone in concentrations of from 50 to 95% is used at six institutions, and lysol or carbolic acid in various strengths or combinations with glycerol or alcohol in about twenty others; biniodide of mercury and "70% alcohol and soda soap" have only one advocate each. It should be understood that these are methods used for simple steel instruments: had the inquiry embraced catheters, rubber articles, and suture materials the variety of replies would no doubt have been greater. The author of this paper, E. E. Ecker, goes on to discuss a large variety of other chemical reagents which have been recommended for instrument sterilization, and seems concerned rather to deplore this lack of uniformity in practice than to advocate any particular method, although his statement that boiling in a 2% solution of soda will sterilize a soil suspension in five minutes implies that here is one answer to the problem. There is, of course, no harm in using whatever method one fancies provided that it works, but some of these do not.

[1] *Surg. Gynec. Obstet.*, 1940, 71, 403.
[2] *British Medical Journal*, 1940, 2, 855.

Ecker expresses the hope that the college whose members he is addressing will officially adopt standard methods for this purpose. There is much to be said for authoritative pronouncement on matters of this kind, based if necessary on a reinvestigation of the methods in use, taking account first and foremost of their dependability, but, having assured that, also of their convenience and cost. To define the best methods of sterilizing all surgical apparatus in general use would be to sweep away a vast mass of varied ritual which, apart from its merits or defects, is a burden and a source of confusion to the nurses who have to carry it out. This is no new subject: the pitfalls of steam disinfection, the inefficiency of alcohol, and the limitations of formaldehyde, for example, have all been discussed in this *Journal* in recent times, as have the new problems in sterilization constantly presented by the ever-increasing complexity of surgical apparatus and the variety of materials used. It is not too much to say that a general overhaul of aseptic technique would benefit everyone concerned.

CROSS-INFECTION IN WARDS

Hospital infections, once a terrifying scourge, are not now as common or dangerous as until nearly the end of last century, but if we have flattered ourselves that they no longer happen studies made during the past few years should have disabused us. Everyone knows that a second disease may occasionally be acquired in a fever hospital, but what we have learned lately concerns the wards of general hospitals and varied types of infection the spread of which can only be traced by detailed bacteriological study. The work of Okell and Elliott on cross-infection by haemolytic streptococci in ear, nose, and throat wards first established this method of study; another example of its application is to be found in the recent paper by A. A. Miles[1] and others on the hospital infection of war wounds. A systematic study by this method in the hospital of its origin is also described by Joyce Wright[2]: this was carried out in the children's wards at University College Hospital, covered a period of one year, and was designed to trace the migrations of haemolytic streptococci. All patients had throat swabs taken on admission and at intervals of a week thereafter; nurses' throats were also swabbed weekly, as were any septic or other lesions as they arose which were likely to be streptococcal. The Griffith type of all streptococci was determined, a proceeding to which this sort of detective work owes almost the whole of its value; but for the almost certain proof of identity between strains which can thus be secured the interpretation of such studies would be mere guesswork. Of a total of 551 cases thirty-six had haemolytic streptococci in their throats on admission; seventy-two (13,1%) acquired a haemolytic streptococcal infection of some kind during their stay in hospital. Most of these individual cases formed items in well-defined outbreaks, some having the dimensions of an epidemic, each due to a single type of streptococcus. Each of these outbreaks comprised a variety of clinical conditions—sore throats, otitis media, wound infections—as well as latent cases in which the organism existed in the throat without producing evident effects. That they were recognized as outbreaks having a single cause was due to their analysis in the laboratory: otherwise the overt cases would doubtless have been accepted as misfortunes in the general run of common experience, while the latent infections would of course have been unrecognized. The exact method of spread was not determined; cubicle isolation prevented it, but whether any measure short of this will be effective remains to be decided. A somewhat similar study has been made by H. D. Wright, H. R. Shone, and J. R. Tucker[3] in diphtheria wards. Here proof of cross-infection depends on the existence of *gravis, intermedius,* and *mitis* types of *C. diphtheriae* and the demonstration that a change of type has occurred in the individual throat: this method, of course, cannot reveal all cases of cross-infection, since the newly acquired infection may be of the same type as that existing before. Nevertheless in over 10% of cases in ordinary diphtheria wards reinfection was proved by this means; where bed isolation was practised it occurred in about 5%, while in cubicle wards it rarely occurred at all. Here again the mode of spread is uncertain; contact between patients and carriers among the staff are possible factors, but the most suspicious finding was the presence of fully virulent diphtheria bacilli, often in large numbers, in floor dust, coupled with the fact that old-fashioned methods of sweeping were employed. It is becoming abundantly clear that the oil treatment of floors recommended by Van den Ende and others,[4] possibly extended as they suggest to blankets, is the first necessity in preventing hospital infections caused by diphtheria bacilli and haemolytic streptococci. Only when this wide-open avenue of spread has been closed, as far as feasible precautions can close it, shall we be able to decide what other channels of infection remain to be stopped.

[1] *British Medical Journal*, 1940, 2, 895, 895.
[2] *J. Hyg.*, Camb., 1940, 40, 647.

BISMUTH IN SYPHILIS

Since the introduction of bismuth as a therapeutic agent in the treatment of syphilis there has been much speculation and discussion concerning its mode of action and the dosage and toxicity of the numerous preparations employed. Kolmer and his associates[5 6] concluded from some experiments in rabbits that toxicity did not necessarily run *pari passu* with the amount of bismuth metal injected; that toxicity and therapeutic effectiveness vary according to solubility, not only in the tissues but in the vehicle, and to rate of absorption and excretion; and that both factors are influenced by chemical constitution. Further, as estimations of bismuth in the blood are not a practicable way of determining maximum therapeutic effectiveness consistent with minimum toxicity, recourse was had to urine estimations. It was found that in the case of infected rabbits the urinary level of bismuth required for biological cure was dependent on both the dose and the length of time it was maintained; a certain minimum level is required even though there is prolonged excretion. Human beings require relatively more metal per kilogramme of body weight than rabbits, and it has been calculated that for optimum therapeutic results the amount of bismuth should be 35 to 45 mg. per dose, which would give a urinary excretion of 2 to 4 mg. The amount of any particular preparation injected and the frequency with which it is given will depend on whether the preparation is water-soluble, oil-soluble, or insoluble, and since absorption of the drug varies not only according to the compound but also in relation to the individual himself occasional determinations of urinary bismuth are recommended. Experiments carried out on spirochaetes prove that bismuth is spirochaeticidal both *in vivo* and *in vitro*. Whether this is due to the element itself dissociated from its compounds or whether it effects a union with

[3] *J. Path. Bact.* 1941, 52, 111.
[4] *Lancet*, 1940, 2, 133.
[5] *Amer. J. Syph. Gon.*, 1940, 24, 415.
[6] Ibid., 459.

the tissues is not established. The latter appears to be more likely, but the metal may act in part by the stimulation of antibody production which results from the release of antigenic substances from killed spirochaetes. As a result of their experiments the authors give a list of recommended doses of eleven different bismuth preparations commonly used in America: water-soluble preparations should be given twice weekly, others once every seven to ten days. Bismuth has also a prophylactic action in syphilis, as shown by the experiments of Kolle,[7] who failed to infect rabbits so long as there was any of the metal in the ear, and by Sonnenberg,[8] who was able to protect prostitutes from acquiring the disease by regular intramuscular injections of the subnitrate. These methods, however, are not a practical proposition for mass prophylaxis of human beings. Hanzlik and his co-workers[9] found that when sobisminol, a preparation which has a curative action when taken by the mouth, was given to rabbits it protected them against experimental infection. In view of the fact that the drug, although comparatively non-toxic, has a curative action in human syphilis, it is suggested that it could be used for human prophylaxis with much hope of success. Although this appears to be theoretically probable, it has not yet been tried out, and the average man will hardly dose himself for a week before exposing himself to possible infection, and after exposure the drug is not likely to prove successful, since the spirochaetes will have established themselves before the bismuth has reached an adequate concentration in the tissues.

PERITONEAL IRRITATION AND INTESTINAL ACTIVITY

The surgeon is constantly confronted by the problem of the management of abdominal distension resulting from peritonitis. The causation of this distension has immediate bearings upon the question of treatment. In the absence of gross obstruction associated with colic, a "mechanical" view must favour operative treatment. On the other hand, if the distension is regarded as neurogenic and due to reflex inhibition resulting from peritoneal irritation, then the treatment must be on conservative lines. From the point of view of management the important case is the one in which there is abdominal distension in the absence of all intestinal activity. In the current number of the *Journal*, Douglas and Mann report a series of interesting experiments which shed a good deal of light on the pathological physiology of the condition. These workers produced exteriorized portions of intestine in rabbits and dogs after the method introduced by Biebl. The exteriorized loop remains in continuity with the bowel, has an intact nerve and blood supply, and is enclosed in a bipedicled skin tube completely shut off from the general peritoneal cavity. Subsequently various irritants were injected into the general peritoneal cavity and observations recorded on the activity of the exteriorized gut segment. For the purpose of these experiments inhibition was considered to mean absolute quiescence of the intestine. In the control series of cases it was shown that the injection of Ringer-Locke solution into the general peritoneal cavity produced an effect on intestinal motility. When standardized irritants were injected these constantly led to prolonged arrest of intestinal movements in the exteriorized segment. This arrest occurred in normal animals after section of both vagus nerves, after section of one splanchnic nerve, and after bilateral adrenalectomy. On the other hand, this inhibition did not occur, or was only temporary, after degenerative section of both splanchnic nerves. On the basis of these experiments the authors conclude that intestinal inactivity is of the nature of reflex inhibition, since by reason of the extraperitoneal situation of the loop of bowel the stimulus is delivered to afferents other than those in the loop. The authors hesitate to apply their experimental results too directly to clinical work, but suggest that their evidence supports the neurogenic explanation of abdominal distension associated with a localized peritonitis. Under these conditions operative treatment by means of enterostomy, etc., is contraindicated, and measures designed to overcome the splanchnic inhibition are indicated—namely, splanchnic block, acetylcholine, or prostigmin.

[7] Harvey Lectures, 1924-5, Series 20, p. 168. Baltimore.
[8] *Bull. Acad. Med., Paris*, 1933, **114**, 374.
[9] *Amer. J. Syph. Gon.*, 1940, **24**, 468.

WARTIME RESEARCHES ON MILK

In war the dairy cow takes rank as "Farm Animal No. 1." Milk, a home-produced food obtained from animals deriving more than 80% of their food requirements from home-grown feeding stuffs, is a means of supplementing and balancing a diet which might easily become in wartime poor in everything except carbohydrates and calories. The shadow of war is cast upon the annual reports of two dairy research institutes lately received, though one of them, that of the National Institute for Research in Dairying, Reading, is for the year ending September, 1939, and the other, that of the Hannah Dairy Research Institute, Ayr, is for the year ending March, 1940. In both institutes the maintenance of as high an output of milk as possible in emergency conditions has become the keynote of the work, and long-range investigations have receded into the background in favour of the quicker but less satisfactory methods of empirical investigation and piecemeal solution. Among other matters with which the National Institute has concerned itself is wartime cheesemaking. Rennet, which is used to make milk coagulate, is an animal product, an extract of a calf's stomach, but a satisfactory method for extraction of a milk-coagulating enzyme from a vegetable source has been found, and cheese for which vegetable rennet was used has recently been produced. Much further work has been done at Reading on the estimation of vitamins in milk. Biological methods had already shown that commercial pasteurization brought about a definite though small loss in the vitamin B complex, and that commercial sterilization destroyed some 30% of vitamin B_1 but had no apparent adverse effect on vitamin B_2. These findings have now been extended by the application of chemical tests, according to which pasteurization destroys 10% of vitamin B_1 but is without effect on riboflavin, while the loss of B_1 in sterilized milk has been found to amount to 50%, riboflavin again being unaffected. In view of the errors of biological assay, the measure of agreement between the findings obtained by the two methods is regarded as satisfactory. Another piece of research concerns the effect of light on the vitamin C of milk in containers. Visible light is known to have a destructive effect on this vitamin, and experiments have been carried out with bottles of different colours. Brown glass bottles have been found to be most effective from the point of view of preserving the vitamin; green glass bottles come next, and then wax-impregnated cartons. In the cartons twice as much of the vitamin survives as in clear glass bottles. Work has also been done at Reading on the physiology of bovine lactation. Repeated injections of ox anterior pituitary extracts rich respectively in prolactin (pigeon crop-gland stimulating factor) and thyrotrophic hormone into cows in declining lactation have resulted in a marked increase in milk yield, and, with the prolactin

preparation, in a substantial increase in fat content, the average daily milk-fat production being raised by nearly 50%. The milk yield does not continue to increase throughout the period of prolactin treatment, but reaches a steady level and then declines. It is considered that the increase in milk yield and milk-fat content following injections of pituitary extracts cannot be ascribed to the action of a single hormone; probably the secretion of milk-fat is a mechanism distinct from those governing the secretion of other milk constituents. The Hannah Institute has also been occupied with lactation studies, especially the problem of inheritance of persistency of milk yield, or the extent to which ability to maintain a level yield is transmitted by the parent. The experimental results demonstrate the important part played by environment in determining the shape of the lactation curve. It seems likely that a uniform method of bacteriological examination of milk may be adopted for Great Britain. Hitherto in England and Wales the methylene-blue reduction test has been used, and in Scotland the plate count. One reason why the former method has not been adopted in Scotland is that it is said to be less reliable when applied to milk produced and handled in a colder climate. The convenience of the methylene-blue reduction test and its simplicity and cheapness in comparison with the plate count have seemed to justify a more detailed examination of the effect of temperature on its reliability, and so far as the work has gone the temperature factor does not appear to be an insuperable obstacle to the adoption of the reduction method under Scottish climatic conditions.

U.S. HEALTH UNIT AND LIAISON OFFICER

With the consent of the President of Harvard University, Dr. J. E. Gordon, who holds the Charles Wilder Chair of Preventive Medicine and Epidemiology at Harvard, has accepted Mr. Malcolm MacDonald's invitation to act as United States Liaison Officer with the Ministry of Health. Shortly after the outbreak of war Harvard University appointed a committee to consider how the university could contribute material or professional help to a cause closely concerned with its interests. The possible nature of this help was conceived in the broadest terms, with the suggestion that it might be in economics, medicine, sociology, public health, law, and perhaps other fields. Through an exchange of opinion between authorities of Harvard and colleagues in Great Britain it later became evident that help in the fields of public health and medicine was most clearly in point. As a consequence Harvard University made a formal offer to the Minister of Health, which Mr. MacDonald gratefully accepted, to equip and maintain in Great Britain a public health unit for the study and control of communicable disease. The purposes of the unit were defined as: (1) to lend material aid to a friendly nation; (2) to investigate communicable disease under unusual military and civil conditions; (3) to obtain medical information of value to the national defence of America. The unit as originally conceived was to include a group of workers concerned with field studies in epidemiology and a laboratory for the study of associated problems. British authorities early pointed out the desirability of adding to this basic unit a well-equipped hospital for the clinical care and study of communicable disease. This addition became possible through the active co-operation of the American Red Cross, who agreed to build and transport to Great Britain a hospital of 125 beds. The final plans for the unit evolved from discussions between Prof. Gordon and the authorities of the Ministry of Health in London during August and September. Facilities and staff are provided for the study of communicable disease in the field, in the laboratory, and at the bedside. Prof. Gordon returned to America in the latter part of September to assemble staff, order equipment, and lay plans for the hospital. He left in London Dr. John R. Mote, assistant in epidemiology in the Department of Preventive Medicine, Harvard University, now acting as medical adviser to the American Red Cross Committee in London, to continue and complete local arrangements. Prof. Gordon has now returned here, and the first shipments of buildings and equipment are expected to arrive shortly. The headquarters of the unit will be in south-west England, with provision for a mobile team to serve more widely as need may arise. As U.S. Liaison Officer with the Ministry of Health, Prof. Gordon has an office in the Ministry, and is taken freely into the confidence of the Minister and the staff of the Department.

THE KING'S ENGLISH

The latest protest against defilements of "our maternall Englysshe tongue" comes, not from Mr. A. P. Herbert, but from another member of the House of Commons, Mr. Henry Strauss, who in a recent letter to the *Times* denounces as a neologism the word "hospitalize," importing to send a person to a hospital, or to admit or to maintain someone there. Most of us will thank Mr. Strauss for his protest against a horrible word of very ambiguous meaning; but even so it may perhaps not lack defenders, for it raises the old issue between the precisians, whom their critics call pedantic, and the colloquialists, whom the "highbrows" dub illiterate. Language, say the latter, must grow; must adopt new words for new conceptions; must throw off the shackles of obsolete convention under pain of becoming not a living but a dead tongue. They note that sometimes the slang of one generation becomes accepted usage, even of the scholar, in the next or the next but one; and if their sentences lack a verb here or grammatical structure there, comfort themselves with the reflection that anyhow people know what they mean, which is not invariably true. So many of us fall into slipshod speech ourselves that these excuses often gain acceptance among those who dislike to label themselves self-righteous. For all that, slipshod speech and writing are merely signs of slipshod thought and downright muddle. The danger is especially to be avoided in scientific writings, where the exact meaning of every word and phrase should be crystal clear and incapable of misconstruction; if medicine is to remain a science it must conform to this standard. English is not an easy language, but every shade of meaning can be accurately expressed in it if sufficient trouble is taken. Many of us, for instance, are too prone to "give a case morphine," when it is the patient, not the case, who receives the drug; or to say the patient "has no temperature," meaning no rise of temperature; or to "operate a tracheotomy" (an Americanism which shows signs of acclimatization here) instead of to perform it. "Reconsider" is another word which gives rise to trouble: its proper meaning is to consider anew: but some people now use it as equivalent to altering a previous resolution, from which the awkward dilemma arises (if this latter usage stands) that one can reconsider a decision without reconsidering it. And if any reader should detect a deplorable solecism in the columns of the *Journal*, all the Editor can say in mitigation is that he will reconsider the matter.

The Right Hon. Malcolm MacDonald, M.P., has been chosen to fill the post of High Commissioner in Canada for His Majesty's Government in the United Kingdom, and is succeeded as Minister of Health by Mr. Ernest Brown, lately Secretary of State for Scotland.

MEDICAL ASPECTS OF A.R.P.

A conference summoned by the Association of Architects, Surveyors, and Technical Assistants and the National A.R.P. Co-ordinating Committee (the body of which Prof. J. B. S. Haldane is chairman) was held at Islington on February 2. It was attended chiefly by members of London local authorities and their medical officers of health and borough engineers, and the full day's discussion ranged generally over the safety and health aspects of the shelter problem.

An introductory statement was made by Mr. P. P. ROSENFELD, a prominent member of both the convening bodies, who declared the surface shelters to be never more than half occupied, basement shelters commanding greater public confidence. He put the case for what is popularly known as the Haldane shelter (though Prof. Haldane makes no claim to be its designer), which is planned in two stages, the first stage giving as high a standard of health and amenity as is immediately practicable, and the second affording opportunity for strengthening and extending to any degree desired as materials and labour become available. Present conditions in shelters—namely, overcrowding and bad ventilation, often combined with damp and cold—were favourable for the incubation and spread of disease. All previous standards of overcrowding control had gone by the board. In the large shelters also, insufficient and insanitary closets and contamination of food and water might lead to outbreaks of typhoid and dysentery, and typhus might arise from the dirty conditions which bred lice. The Chief Medical Officer of the Ministry of Health had stated that, apart from a certain increase in the incidence of enteric fever and cerebrospinal fever, there were no signs as yet of epidemics. But this, in Mr. Rosenfeld's view, gave little cause for satisfaction, because epidemics arose as a result of lowered standards of resistance coupled with such conditions as existed in many shelters, and once the ground was favourable epidemics might spread like a flame. He also criticized the insufficient height and faulty design of the bunks, the absence of ventilation plants in many shelters, and the instruction to local authorities to put in coal-burning stoves when electrical heaters would be preferable on all grounds.

Those responsible for calling that conference, he said, took the view that it was possible to provide shelters which were far safer than the present types and would furnish healthy conditions and reasonable comfort. The requirements to be fulfilled in a better shelter policy were: (1) a higher standard of protection against high explosives; (2) protection against gas attacks over long periods; (3) healthy conditions for sleeping, including some privacy, and proper spacing of bunks; (4) arrangements for seating; (5) proper sanitary arrangements, including washing facilities; (6) feeding arrangements, providing a limited number of hot meals for those who left straight for work, as well as hot drinks and snacks; (7) medical facilities and isolation arrangements; (8) ease of administration of shelters by marshals and local authorities.

Health Conditions in Shelters

Dr. JOAN MCMICHAEL, in introducing the medical aspects, said that the most important factor in the spread of epidemics was overcrowding, which in some shelters was present to an extreme degree. The possible sources of illness were many, including air-borne or droplet infections, infections due to direct contact, infections arising from defective sanitation aggravated by overcrowding, infections carried by animal pests (including mosquitos which bred in stagnant pools of water in some warm underground shelters), deficiency diseases, especially among Tube shelterers condemned for long periods to remoteness from air and sun, and finally the many hours in cramped positions might bring about an increase in the number of sudden deaths from pulmonary embolism. The Horder Report said that people should be encouraged to use the Anderson shelters, but it must be remembered that there was often severe overcrowding in these shelters, with far less warmth, comfort, and safety than in the public shelters. A good shelter programme should combine the maximum degree of safety with the minimum risk of disease. The two-stage shelter advocated by the A.R.P. Co-ordinating Committee was the best, because it left room for a certain amount of dispersal through the sections and was also to be approved from the medical point of view.

In the general discussion widespread dissatisfaction was expressed with the Government's shelter policy, and, particularly, with the failure to consult borough engineers and surveyors on problems relating to their own areas. Lack of co-operation between the Government and local authorities was evidently a sore point. Several representatives declared that they ought to be given more responsibility in their own localities and be less subject to the vagaries of Whitehall.

One speaker, a woman councillor, complained that doctors and nurses were being drafted into shelters rather with the idea of waiting for epidemics to turn up. Of course, in a large shelter many ailments besides epidemic illness call for attention. This speaker also mentioned the question of shelter sanitation and the "scandal of the bucket" on the Tube platform to be found at many stations. Water closets were still allowed only in certain cases. The compressors being fitted in Tubes to pump up the sewage would still necessitate the use of chemical closets, although they could have been arranged so as to be capable of taking water closets at a future date. An architect said that the installation of water closets would have been perfectly feasible; the initial cost would not have been much greater than that of the mechanical ejector system, and the cost of upkeep much smaller.

The conference also discussed the care of the bombed-out, and a plea was made for the appointment of officers in every borough whose task it would be to see that these people were dealt with rapidly and effectively, also for the keeping of registers of empty houses in which homeless persons could be placed immediately. A resolution was carried unanimously expressing disquiet at the effects of the Government policy in the London area, and urging much higher standards of safety, health, and welfare in the shelters, in particular the adoption of a design of shelter which would allow subsequent strengthening so as to render them proof at least against direct hits by bombs of medium calibre. The resolution also stressed the need for representation of local authorities in the offices of the Regional Commissioners.

AWARDS FOR GALLANTRY IN CIVIL DEFENCE

The award of the George Medal to Dr. Malcolm Manson, *M.C.*, Medical Officer of Health, Wood Green, is announced in a *Supplement* to the *London Gazette* dated February 7, and in the same issue the names of Dr. John Spittal Cameron, assistant medical officer, Emergency Medical Service, Fulham, and Dr. David Cochran Hanson, *M.C.*, medical officer of mobile unit, Emergency Medical Service, Fulham, are included in a list of those who have received commendations for brave conduct in civil defence.

Dr. MALCOLM MANSON: "A heavy H.E. bomb fell, causing a tunnel to collapse. A number of people were trapped under the debris and the clay which had fallen through the cavity. Dr. Manson arrived on the scene within a few minutes of the occurrence, and immediately assumed the direction and leadership of the rescue work. For nearly three hours he worked without intermission actively participating in the release of persons trapped in the debris heap, giving medical aid where it was needed and all the time keeping effective control. Throughout this period he was in grave personal danger from frequent falls of clay. It seemed likely that a further portion of the tunnel would collapse. At one period he was lying full length on the heap endeavouring to release a man partially buried when there was a shout from the look-out man of 'Run for it.' The doctor ignored the warning and continued his efforts for the trapped man. There was a large fall of clay and the doctor was struck by a large piece full in the back. He was partially buried and had to be dragged out feet foremost. He rested for a few minutes, and then, in spite of severe pain, carried on with the work. Dr. Manson's pertinacity, courage, and disregard of personal safety set a wonderful example to the men and was no doubt responsible for the saving of a number of lives which otherwise would have been lost. He sustained serious injuries during the rescue operations."

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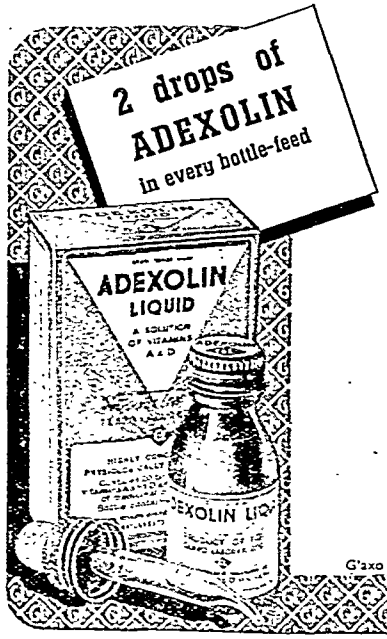
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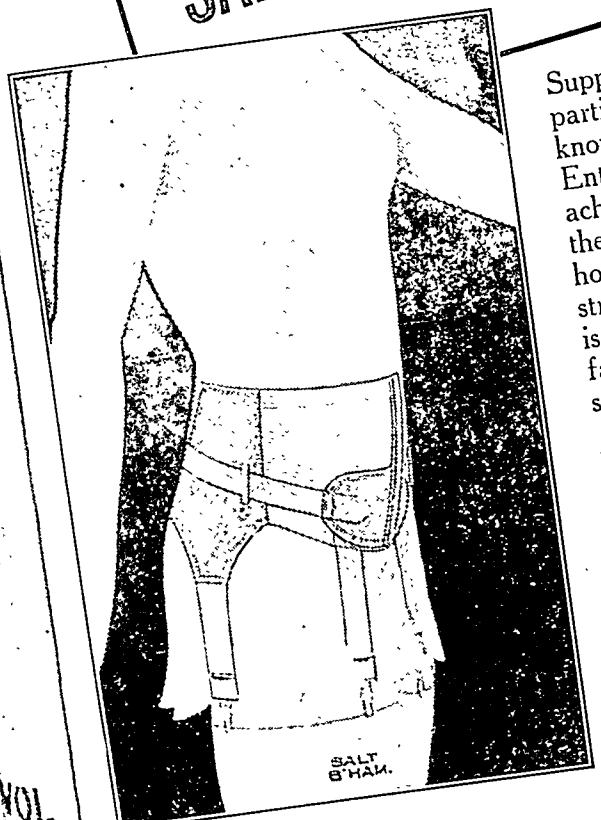
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Correspondence

Nuffield Provincial Hospitals Trust

SIR,—Your admirable leading article on the Nuffield Provincial Hospitals Trust (January 25, p. 125) was welcome to those of us who are engaged in solving the problems of hospital regionalization. There are, however, some statements therein which might give rise to misunderstanding and perhaps to apprehension.

Referring to the Medical Advisory Council as representative of "several specialisms in medical science," you hardly do justice to its composition. Although the council is not yet complete it does contain representatives of general practice, both urban and rural, general and specialized consulting practice, public health and preventive medicine, pathology, teaching and research. Moreover, its members are drawn from widely separated areas in England, Scotland, and Wales, and include several who have worked or are working with local authorities. Great distances have not deterred them from attendance at meetings in Oxford even in these days of slow and tiresome travel.

You suggest, too, that the main obstacle to our activities is "the reluctance of some local authorities to co-operate." My experience does not lead me to take that view. There *is* reluctance to be met with here and there on the part of local authorities *and* of voluntary hospitals, which is only to be expected before any new scheme or principle is accepted, but, generally speaking, local authorities have been most responsive and co-operative. Perhaps this may be due in part to the fact that the provisional Central Committee does already contain at least six members who are actively engaged in city and county council administration, a representation of local authorities which is likely to be increased in the near future.—I am, etc.,

Christ Church, Oxford, Feb. 3. E. FARQUHAR BUZZARD.

Insulin Supplies and Wartime Economy in Prescribing

SIR,—In recent months anxious letters from diabetics all over the country, but mostly from small towns and villages, have shown their difficulties in obtaining their accustomed supplies of insulin. Bombs have certainly destroyed some insulin supplies, but not enough to make any real difference to the abundant stocks in this country—of this diabetics and their doctors may rest assured—though local distribution has been temporarily upset. The manufacturers have noted that, besides the annual gradual increase in the sale of insulin, national emergencies like September, 1939, the fall of France, the beginning of the air "blitz," push up the insulin sales by 20% to 40% for a few weeks. As a result local supplies are almost depleted; diabetics cannot obtain all they want of their usual make or strength of insulin: they panic a little and press the local chemist, who makes unexpected demands on the manufacturer, and so on. So the local supply of insulin can be temporarily upset by greatly increased demands, especially when delayed distribution is sometimes inevitable. A recent article in the *Pharmaceutical Journal* (December 7, 1940) urged chemists to lay in larger stocks of insulin, and this, though all to the good of diabetics in some ways, had the unfortunate result of putting some manufacturers under difficulties and accentuated the local shortage in some areas. Doctors, chemists, and diabetics could help the manufacturers greatly in the adequate distribution of insulin by making no sudden increased calls for it, but quietly laying in adequate stocks by careful provision.

Also, by prescribing and using the more concentrated strengths of insulin all concerned could help greatly and contribute to national economy. One of the main difficulties for manufacturers now is the supply of suitable glass, and in this an obvious economy is possible. There are three strengths of insulin on the market—20, 40, and 80 units per c.cm. (this is unfortunately not generally realized)—and it is obvious that by prescribing the stronger solutions large numbers of bottles and packings could be saved. At present the weakest strength is still most widely used, and if 40 units per c.cm. insulin were prescribed instead of 20 units per c.cm., 20,000 bottles a week would be saved.

Apart from economy, there are other good reasons for using the stronger insulins. Most patients prefer them when they know about them, because they reduce the volume of the injection without making the accurate measurement, even with small doses, difficult. Again, at present numerous mistakes are made between the three strengths of insulin, which would ultimately be reduced by the use of only two varieties—40 and 80 units per c.cm. This would also bring soluble insulin into line with protamine insulin, of which no 20 units per c.cm. strength is manufactured. Personally I have not prescribed the weakest solution—20 units per c.cm.—for four years, think it unnecessary, and that its disappearance from the market would be a blessing to diabetics and manufacturers. Then we could have a standard insulin solution—U40 per c.cm.—for most general use and a stronger solution—U80 per c.cm. —for patients on very large doses. To effect such a change I suppose the *British Pharmacopoeia* and other necessarily slow-moving bodies must be concerned. In the meantime, therefore, I would urge the immediate prescription of the stronger insulins, with corresponding reduction of the amount drawn into the syringe.

Doctors should also reassure diabetics, who are often ridiculously conservative in their use of one particular make and strength of insulin, that all brands and strengths in this country are equally good and active, and can replace, if necessary, their favourite bottles, if the correct adjustment is made in the syringe when the strength—20, 40, or 80 units—is changed.

I would also make a plea for change in the clumsy nomenclature we use and the confusing differences in labelling used by our three manufacturers of insulin. In this letter I have had to waste your valuable space in talking about insulin 40 or 80 units per c.cm.—which means little to many patients and is a tongue-tying description. The Americans aptly call and label these insulins U40 and U80 (clear and short terms), and if this practice was adopted here in bold letters on the bottles much dangerous confusion between doctors, nurses, and patients about different strengths would be minimized.—I am, etc.,

London, W.1, Feb. 7. R. D. LAWRENCE.

Civilians Blinded in the War

SIR,—Attacks from the air have already resulted in a number of cases of blindness among civilians, and doctors responsible for the care of such cases are faced with a specially difficult task when the time comes for them to acquaint their patient with the fact that sight has been lost. However tactfully and wisely that information is imparted it is bound to be a shock, and I may be permitted, perhaps, to emphasize that the patient, when he learns the truth, should be at once assured that proper training will enable him to overcome the handicap he has now incurred, and that training and help of the most practical kind are available to him.

I take leave in this connexion to call the attention of doctors to the comprehensiveness of the system of blind welfare now established in this country. It provides for the education, social care, training, and employment of blind people of both sexes and of all ages. The county council or the county borough council of the area in which the patient's home is situated is responsible, under the Blind Persons Acts, for ensuring that every blind person is provided for according to his or her needs. Any hospital, therefore, which has a blind patient should notify the responsible local authority. If there is any doubt of the right person to address in the matter, we, at the National Institute for the Blind, will gladly act as intermediary and give any possible help.

May I add, Sir, that the rehabilitation and re-education of civilians who are blinded in the war is a matter of the keenest interest to us and other voluntary organizations which work in co-operation with the responsible local authorities in all parts of the country, and that no effort will be spared to meet their needs, however great they may be.—I am, etc.,

W. MCG. EAGAR,
London, W.1, Jan. 31. Secretary-General.

The Transfusion Problem

SIR,—We were interested in the last paragraph of Dr. DeGowin's letter on the transfusion problem (February 1, p. 169), concerning the temperature at which stored blood should be given.

We are in entire agreement with his statement that it is unnecessary to warm stored blood, beyond, perhaps, allowing it to come to room temperature by removing it from the refrigerator about thirty minutes before use. This is only done if time allows. As long as the drip method of transfusion is used we can see no possible danger at all, and, in fact, it is our personal experience since we ceased warming blood as a routine before transfusion that reactions have been far fewer. The probable explanation of this observation is that the rather haphazard method previously employed—namely, immersing the blood container in a receptacle with warm water at about 105° C., to which further hot water was added from time to time—caused overheating of the red blood cells in immediate contact with the glass container, resulting in the destruction of these cells.

In a short paper entitled "The Use of Placental Blood for Transfusion" published in January, 1939 (*Lancet*, **1**, 200), in collaboration with K. G. Seager, we stated: "We are now of the opinion that it is unnecessary to heat the blood before use."—We are, etc.,

A. P. M. PAGE.
Leicester, Feb. 4. E. M. WARD.

Optimum Calcium Requirement

SIR,—Dr. I. Harris and Messrs. J. T. Ireland and G. V. James, in summing up the conclusions of their article on optimum calcium requirement (January 11, p. 49), make very definite statements which, if correct, are of great interest to those concerned with dietetics and their social implications.

They state that there is no particular evidence to suggest that the great majority of our population suffer from the effects of calcium insufficiency; that the calcium intake of the present dietary regime is ample; that large sections of the population eat too much calcium-rich food; that there may be some indication for reducing food calcium but none for increasing it; and that half the population will suffer from the effects of hypercalcaemia if the calcium content of our diets is increased.

As these conclusions are so far-reaching it is worth while to examine critically the evidence on which they are based. To do this, however, one needs many more details than are given in this article. One would like to know, for instance, the method used to estimate the serum calcium; what type of diet was given to the patients in the experiments and how its calcium content was determined; whether the high calcium diets mentioned were arrived at by the addition of calcium salt, and if so what salt? Do the authors consider that the short period of fourteen days during which the experiments were conducted is sufficient to justify such sweeping conclusions as to calcium balance? Have they taken into account the fact that calcium intake must inevitably be greater than calcium absorption, which accounts for the increase in faecal calcium which they observed in their high-calcium-diet results? Regarding the patients' diets at home, it would be useful to know what tables of values were used in estimating the calcium content and the weekly wages of the patients in question.

The animal results as published are particularly inadequate. They do not tell us how many animals were kept on a calcium-rich diet, for how long, nor the nature of the diet or the method of estimating its calcium. Moreover, are we justified in drawing any conclusions as to human calcium needs from an animal with such very different dietetic habits as the rabbit?

We are told that calcium is second only to protein as an important factor in kidney strain, but we are given no inkling of the actual proportion of kidney work which comes under the heading of calcium secretion. The figures quoted give the misleading impression that the total kidney work in high and low calcium diets is 18.8/5.1 respectively, or 14.0/0.9 in the second case mentioned. Finally, one may ask if it is justifiable with such a common condition as arteriosclerosis to draw any conclusion from the Registrar-General's returns, since in many cases in which it occurs arteriosclerosis will not be mentioned on the death certificate.

Until more detailed and satisfactory results are available I see no reason to disagree with Sir John Orr's dictum that half our diets are deficient in calcium. As our knowledge of the subject grows it may be that we shall find more abundant clinical evidence of calcium deficiency. Studies of the type carried out by Miss Irene Allen (January 11, p. 44) may be a step in this direction. The mere fact that our existing views on diet are based on inadequate data is no excuse for attempting to disprove them with data which are equally, or even more, inadequate.—I am, etc.,

Northwood, Middlesex, Feb. 1. B. H. KIRMAN.

Differences in Infectivity at Home and Abroad

SIR,—I have recently returned from escorting 300 evacuee children to the United States. Shortly after we arrived there one of the children, a boy aged 5, developed a severe attack of chicken-pox, which I and the American doctors who saw him decided was most probably developed from an infection received in the United States. Reference to his medical documents which I had taken with me showed that he suffered from chicken-pox in England exactly a year before he went to the United States. Unfortunately the doctor who attended him then is now a prisoner of war, but I have obtained information from his locumtenent, who looked up the details of the attendances at that time, and discovered that the diagnosis was chicken-pox. The extraordinary thing about the attack in the United States was its extreme virulence, and it seems a justifiable conclusion to me that there is some difference between the infecting agent in the English variety of chicken-pox and the American variety. I wonder if this is an actual observed fact and if anybody can corroborate it. One would have thought that an attack of chicken-pox only a year previously would have guaranteed a fair degree of immunity to infection so shortly afterwards, and this is rather borne out by the fact that other children on the way over developed a mild form of chicken-pox, the infection from which was received in England. As it was more than three weeks after we landed in the States that the child developed this other attack it would seem that the infection was undoubtedly of the American variety.

All this prompts me to ask whether there may be similar differences in the infectivity of other diseases in the States as compared with the same diseases in England. I have observed in the Press that quantities of serum for immunization against diphtheria are being flown from the States for use in this country, and I should be interested to know whether it is possible that this serum may not immunize against our British brand of Klebs-Loeffler bacillus.—I am, etc.,

Wealdstone, Feb. 5. J. B. WRATHALL ROWE.

Prepared Bran in the Prevention of Constipation

SIR,—I hear that "All-Bran" has been classed with "luxury breakfast foods" and will cease to be obtainable when the present stock has been sold out. I have no financial interest in the manufacture of this preparation, but I am convinced that the impossibility of obtaining it would be harmful to the numerous persons who depend on it for the prevention of constipation. Many of them would feel themselves compelled again to resort to purgatives of various kinds, from which they have successfully freed themselves by the help of bran.

The truth is, of course, that All-Bran consists almost entirely of cellulose, which, as is well known, cannot be absorbed from the human alimentary canal and therefore cannot be termed a food in the ordinary sense. As it cannot be absorbed, it inevitably increases the bulk of the contents of the large bowel and thus favours defaecation. Everyone depends more or less on cellulose for the normal action of his bowels, but, just as some children require more vitamin D than others in order to escape rickets, so some individuals require a greater cellulose intake than others to avoid habitual constipation. I need not enter here into the reasons why some children require the intake of more vitamin D than others, or why some persons need more cellulose than others

in order to avoid constipation. Factors in early upbringing and general hygiene may have much to do with it, and especially the prevalent habitual use of purgatives of all kinds, though the constant use of purgatives has at last become less universal, thanks to popular teaching on the subject.

It is hardly an exaggeration to say that of the adult patients I formerly used to see in hospital as well as in private practice a large proportion thought that they could not possibly get on without the habitual use of purgatives. Many of the others avoided constipation by bulky diets, which, though they provided sufficient cellulose to avoid constipation, tended to induce obesity and other evil results of over-feeding—often aided in that respect by insufficient open-air exercise. In fact, the large meals which they took contained enough cellulose but too much nutritive material of various kinds, and thus, though their intake saved them from habitual constipation, the results of habitual over-nutrition tended to shorten their lives, making them die from degenerative diseases before their time—say, between 55 and 65 instead of between 65 and 75 or later.

For those persons whose bowels require a relatively large proportion of cellulose in order to act properly it is a hardship to cut off their bran supply. For many of them excess of the stringy cellulose of vegetables causes flatulence and does not act so well as does the granular cellulose material of All-Bran, which swells up to a mucilaginous consistence in the bowels. All-Bran is, as far as I know, the only properly prepared bran at present available in England, and it would be, I think, a great pity if the supply were cut off. How far ordinary bran, as given to animals, could be used for the same purpose, I am not able at present to say.—I am, etc.,

London, W.1, Feb. 5. F. PARKES WEBER.

Research in Stilboestrol

SIR,—In your issue of December 21, 1940, there is on page 876 a definite misstatement with regard to stilboestrol. This substance was produced as the result of a very long series of investigations in our respective departments, and if you refer to the various publications you will find acknowledgments to commercial firms for the assistance we received. Thus in the paper by Dodds and Lawson describing for the first time oestrogenic compounds which do not contain the phenanthrene nucleus (*Proc. roy. Soc.*, B, 1938, **125**, 222) we acknowledged the great help given by Dr. F. Lee Pyman, F.R.S., of Messrs. Boots Pure Drug Co., Ltd., who supplied us with a whole series of phenyl methanes and ethanes. Again, in the paper by Dodds, Golberg, Lawson, and Robinson (*Proc. roy. Soc.*, B, 1939, **127**, 140) acknowledgments are made to Messrs. Boots for assistance in the preparation of diethylstilboestrol and to the British Drug Houses, Ltd., for a communication respecting the properties of diethylstilboestrol.

Whilst it is true that the investigations were begun and carried out in university laboratories, it is definitely not true to say that the drug houses made no contribution whatever to the work.—We are, etc.,

E. C. DODDS.
R. ROBINSON.

The Courtauld Institute of Biochemistry, Middlesex Hospital Medical School, and the Dyson Perrins Laboratory, Oxford, Feb. 5.

*** While accepting the above correction, we would stress that the research on stilboestrol was initiated in university laboratories.—ED., *B.M.J.*

Recruits and Tuberculosis

SIR,—Examination of the chest for tuberculosis in recruits and other applicants for war work is more a dynamic or physiological than a static or anatomical problem. Our object is not so much to discover what lesions are present as to estimate their probable effect upon health under the new conditions of life—and this cannot in doubtful cases be done by physical examination alone, with or without x rays, or at one sitting. Moreover, we have to allow for undiscoverable lesions in the lungs and elsewhere.

During the last war as tuberculosis officer, and both earlier and later in sanatorium practice, I found many examples of quiescent or arrested tuberculosis in which without a practical test one could not estimate the chances of health. The story of Aesop and the traveller is apposite here. Some of my patients who had had tuberculous lesions in the lungs served in the Army with credit and without a breakdown; and, of course, thousands who have minimal tuberculous lesions in the body remain in excellent health.

In the Army, apart from injury, the chief differences from ordinary civil life depend upon over-exertion and lack of rest, irregular meals, exposure to trying weather or climate, sometimes on stuffy rooms or dusty or poisonous atmospheres. Local extension of a tuberculous lesion is usually very slow; but we may take any evidence of the leakage of toxins into the general circulation with imperfect compensation as a sign of activity. An exercise test with very careful thermometry will often help in doubtful cases. The usual methods of temperature-taking by nurses or overworked medical practitioners in civil life would, however, be of no use for such a test.—I am, etc.,

Farnham, Surrey, Feb. 1. F. R. WALTERS.

Prosthetic Ulcer of the Mouth

SIR,—I was much interested in Mr. H. T. Simmons's paper on prosthetic ulcer of the mouth (January 25, p. 119). I described this condition in 1939 (*Practitioner*, 1939, **143**, 113) under the designation of "denture ulcer and denture granuloma," the term "granuloma" being necessary, as many of these cases do not present themselves as ulcers. Hospital records do not present a large series, as many are treated in the out-patient department. It is, in my opinion, a relatively common condition, and this is not surprising in view of the neglect with which many persons treat their dentures. In a series of fifty-eight consecutive individuals, all of whom were wearing dentures and who were admitted to hospital for various surgical conditions, I found that fourteen had not had an adjustment or remodelling of their dentures carried out for ten years or more, the average period being twelve and a half years. It is significant that these individuals had not seen a dental surgeon for a similar period. Another interesting feature elicited was that in six instances the wearer was not in the habit of removing the denture for regular cleansing, and one woman had not removed her denture for several years. In this instance the woman states that she had on several occasions attempted to remove her denture, but had failed to do so. Other factors in the causation, in addition to those mentioned by Mr. Simmons, are alteration of the distribution of occlusive pressure and alteration in the action of the temporo-mandibular joint coincidental with the age changes at the angle of the jaw. Removal of the offending denture eliminates all pain, tenderness, and discomfort within a short space of time, but, once developed, the swelling does not appear to shrink, even when the causation factor is removed.

Provided the possibility of a denture granuloma is considered, it is not likely to be confused with a carcinoma of the gum, especially as the granuloma is covered by normal epithelium and is firm or elastic in consistence.

With regard to treatment, I think quicker healing can be obtained by an elliptical excision of the swelling, followed by loose suturing of the adjacent mucosa over the denuded area. This can be done under local anaesthesia, and healing is usually complete within ten days. My experience corresponds with that of Mr. Simmons in that these small lesions are extremely radio-resistant.

Finally, I suggest that the description "dental granuloma," implying cause and effect, is preferable to such terms as false epulis, localized hypertrophy or papilloma of the gum, or even prosthetic ulcer of the mouth, especially as the lesion may present as a granulomatous mass without ulceration.—I am, etc.,

Liverpool, Feb. 1. J. COSBIE ROSS.

SIR,—The condition described by Mr. H. T. Simmons in the *Journal* of January 25 is one well recognized by dentists. The ulceration and hypertrophy of the tissues in the lip or the cheek sulcus which is described is due to pressure of a denture.

Dentures are constructed, especially for edentulous mouths, to obtain the maximum amount of retention, and hence of stability. This entails making the "gum" portion of the

denture (that is, outer and inner rims) reasonably deep; it is a simple matter to reduce the depth, and therefore it is wiser to err in making it too deep rather than not deep enough. Consequently, it is usually necessary sooner or later to reduce the depth, or, to use the dentist's term, "ease" a denture. Patients vary greatly in their sensitiveness to the pressure of dentures: some describe the slightest abrasion of mucous membrane as acute discomfort, while others will tolerate, with little or no inconvenience, a denture which is cutting deeply into the gums. If for some reason or other the necessary easing of a denture is not carried out, the condition described by Mr. Simmons may in time result, and is more likely to do so in those patients with less sensitive gums who are, consequently, less likely to seek relief.

The condition is simply an ulceration due to pressure (that is, trauma), such as would occur in other parts of the body under similar conditions. It does, as Mr. Simmons states, appear to occur more often in the front than the back of the mouth and in the lower rather than in the upper jaw. The groove or grooves in which the denture lodges or dislodges is/are formed by an overgrowth of the gums (that is, mucous membrane) rather than by a destruction of the gums; the condition is similar to that of a tightly fitting ring which may become embedded in the tissues if the finger should swell. The gums eventually become "ploughed" into deep furrows and ridges by constant movement of the denture, especially if its edges are sharp. In a pronounced case this may take months or years to develop. The situation is determined by the site of pressure; the fraenum of the upper and lower lip may account for its more frequent appearance in the middle line. Atrophy of the alveolus, by allowing the denture to sink more deeply into the gums, and also by favouring its mobility, is probably an important factor in initiating this condition.

I have observed this condition in varying degrees on very many occasions—probably a hundred or even more—and have rarely seen, as far as I can recollect, malignancy as a result, although naturally the condition does not confer immunity. Ulceration, even in the deeper portions of the furrows, is not necessarily present, but, if present, the lymphatic glands in the neighbourhood may be enlarged, as with any other form of surface infection. Age, sex, and site play no very important part provided the above conditions are present, but it is undoubtedly more common, as Mr. Simmons remarks, in edentulous mouths, which are usually associated with advance in years.

The treatment I have adopted in those cases requiring operation is: (1) To infiltrate with a local anaesthetic the linear ridges or fringes of mucous membrane. (2) To grasp the free margin of the fringe with one or more pairs of pressure forceps according to its extent. (3) To excise the fringe (nearly at a level with its base or origin) with scissors curved on the flat, the fringe being held taut meanwhile by means of the pressure forceps. (4) To deal with any secondary fringes in a similar way. (5) To bring the edges of the wound together with one or more stitches, if this is necessary. (6) To instruct patients to discard their dentures until the wound has soundly healed (usually two or three months) and then to have either their present denture modified or preferably a new one made to the altered conditions of the mouth. Reducing the edge of the denture alone is insufficient except in slight cases, when the commencing elevations or ridges consist of vascular granulation tissue and not the firm fibrous tissue which is formed later. I described this method of treatment in 1911 (Annual Reports, Royal Dental Hospital, published by John Bale Sons and Danielsson, London).—I am, etc.,

London, W.1, Feb. 3. F. COLEMAN.

Acute Bronchiolitis in Children

SIR,—The morbid anatomy of bronchitis and bronchiolitis and its relation to their clinical manifestations has been the subject of our investigations for a long time. Therefore we would like to make some additional remarks to the excellent article by Drs. D. Hubble and G. R. Osborn (January 25, p. 107). We agree with the authors of the article that bronchiolitis in influenza is a very grave complication indeed. From the point of view of morbid histology influenza-bronchiolitis holds a kind of key position. We have described this ty with its peculiar features in a recent paper (*Archives of Dise in Childhood*, December, 1940). We pointed out in this pap that bronchiolitis is a complicated affair, and that a numb of types must be differentiated. Two main groups may distinguished: catarrhal and mural bronchiolitis. The lat again consists of three types which are the result of more less intense inflammation: simple, proliferative, and destructi mural bronchiolitis. The proliferative type is most frequent met with in influenza, measles, etc. This peculiar form described in detail in the article mentioned.

Secretion, which plays such an important part in the catar and inflammation of the bronchi and bronchioli, is discuss in an article to be published shortly. The distribution of t glands and of other secreting tissue all over the air-conducti tubes is described in this paper, which is based on extensi investigations with a special method. In addition the artic gives an exact histological definition of bronchi and bronchio This, we believe, will help to separate the clinical picture bronchiolitis from other conditions affecting the bronchial tre —We are, etc.,

STEFAN ENGEL.
London, N.W.7, Jan. 31. G. H. NEWNS.

Sterilization of Instruments

SIR,—Dr. H. J. Parish (January 25, p. 130) stresses on again the importance of sterilizing instruments by heat f diphtheria and other inoculations. Many doctors think th frequent boiling of needles soon blunts them, and it is n altogether easy to make suitable arrangements for the rapi inoculation of large numbers of children, etc. In view of th enormous number of inoculations required at the preser time, details of a simple routine which I think meets the nee of sterilizing by heat quite adequately may be of gener interest.

One syringe is used for performing the inoculation, an should, for rapid working, be large enough to contain ten t fifteen doses at one filling; a second syringe—preferably 5 c.cm.—is in the hands of an assistant, who can be instructe in her duties in a few moments. The second syringe is fir filled with sterile water, and when the first inoculation ha been performed the needle is taken off by the operator an placed on the syringe held upright by the assistant. She the squirts a few minims of water to clear the needle and dips th needle only for 10 seconds into a pan of boiling water. Th syringe is then held with the needle upright and a sma amount of air drawn through the needle. Emptying th needle in this way minimizes the very real danger that som water remaining in the needle may be injected with the inocu lation and materially upset the accuracy of small doses such a 0.1 c.cm. of A.P.T. By this time the operator has inoculate a second child, and he takes off his needle and puts it on th nozzle of the assistant's syringe, from which she has remove the freshly sterilized needle and proceeds to put it on th vacant nozzle of the operator's syringe. In this way onl two needles are used, and I find in practice that this arrange ment works very well and rapidly. The basis for this metho is to be found in the interim report on "Hospital Infectio of War Wounds" in the *Journal* of December 28, 1940 (p 895), where it is stated: "A dip lasting five seconds was lethal in all tests." If this applies to artery forceps, which hav quite a definite heat capacity, it must apply even more strongl in the case of a hypodermic needle, which has practically n heat capacity at all. Needless to say, it is only the cannul of the needle which needs to be dipped into the water eac time, and if desired sterilized forceps could be used instead o fingers to remove the needles from one syringe to the other though I doubt if this is necessary with moderate care.

If there is any real danger from trusting to alcohol steriliza tion it seems right that the authorities should forbid reliance on this method for mass inoculations of all kinds, and th method I have outlined enables one to utilize heat sterilizatio with a minimum of difficulty, and also a minimum of equip ment and assistance. I personally have not been able t detect any blunting of the needle after many such short-im mersions in boiling water, and I think it is only prolonge boiling which is likely to have any such effect.—I am, etc.,

Winsford, Feb. 1. W. N. LEAK.

Adrenaline in Asthma

SIR,—The correspondence resulting from the letter of Sir Arthur Hurst (September 7, 1940, p. 337) has raised many points of interest. Apart from the reported failure of adrenaline in some cases, the danger of morphine in severe asthma has received timely warning from Dr. M. Park (January 11, p. 65).

In addition Dr. Park raises other points of interest in the very difficult cases of status asthmaticus.

(1) Can the pathological conditions which cause the different types of status asthmaticus be diagnosed clinically from the history or examination? These often can, for the causes of status asthmaticus are often the causes which produce the ordinary attack of asthma in the same individual. Occasionally it is otherwise, as in the case of a male asthmatic, hyperpietic, who was under treatment for asthma in Stobhill Hospital. While improvement was being maintained he acquired an attack of fibrositis. For its relief he was given veganin tablets by a house-physician, and within thirty minutes he commenced having severe asthma. This defied adrenaline for three days, and he looked like dying. Intravenous aminophylline was then suggested, and its success was immediate. It would be interesting to know whether this medicine has good effect on other aspirin-sensitives.

(2) If so, are any of the different methods of treatment applicable particularly to a particular pathological state? and (3) Are there any other indications for the selection of the method of treatment, any contraindications, or is there anything noteworthy in the method of administration? Adrenaline should always be tried first and repeated, but three points in the treatment should always be kept in mind. First, the difficulty in getting rid of tough mucus plugs. As mentioned previously (November 16, p. 684), 30 to 40 grains of sodium iodide in 250 c.cm. glucose-saline solution should be given intravenously if there is no iodide intolerance. Other methods include bronchoscopic suction and emesis. Secondly, dehydration; this must be combated by saline-glucose intravenously, and it may be a life-saving measure. Also, the glucose supplies a source of energy. Thirdly, rest, oxygen inhalations, ether rectally or by inhalation, or barbiturates variously administered may be tried in appropriate doses in suitable cases. The discussion of the treatment of status asthmaticus is one on which considerable time and space may be spent, but its ultimate conquest depends essentially on the alteration of the physical or biochemical constitution of the individual which predisposes to the asthmatic diathesis.—I am, etc.,

Glasgow, Jan. 19. GEORGE KRASNER.

The Fixed First-aid Post

SIR,—For some time past we have been reading in the *Journal* many views on the use and service of mobile units in A.R.P. These can only be gauged by the results and useful work done in each district. Of the fixed first-aid post we have heard nothing, except that some of your correspondents choose to ignore them, and speak of all cases being sent to hospital, just as if no intermediate source of help existed between the mobile unit and the hospital ward. As one in charge of a fixed F.A.P. in a London district which has suffered heavily, I think that excessive numbers of casualties are being whisked off to hospitals without any attempt being made reasonably to segregate them. This is due to the difficulties met with by the hard-worked ambulance services, etc.

In my view, most cases of injury, major or minor, can be dealt with satisfactorily at any fixed F.A.P. and so prevent the terrible rush of cases to already overworked and lessening numbers of hospitals. I know the answer to this suggestion is that the Ministry says "only walking cases to the F.A.P." It is with this attitude that I join issue. Most cases at the post can receive appropriate anti-shock treatment; haemorrhage can be controlled; fractures can be temporarily splinted; and patients allowed to recover in the warmth and bright surroundings of the F.A.P. After a reasonable time the ambulances can be summoned, and if correct treatment has been given the casualties can then be removed to hospital, where they can be put to bed and perhaps left till the following morning. This is much better than having ambulances bumping about through streets unknown to the drivers in the dark and sometimes taking up to half an hour to reach the allotted hospital. This would also give the hospital staff a breathing space wherein to deal with other casualties as they arrive.

It is, in my view, an inhuman act to turn away from the F.A.P. any case capable of receiving adequate temporary treatment there, however serious the injury may be. I do not know what the experience and views of other medical officers of a F.A.P. are, but I fancy none of them would shirk dealing with any form of casualty brought to them.—I am, etc.,

DANIEL HUGHES,

Feb. 5 M.O., Fixed F.A.P., London.

The Mobile Unit in Action

SIR,—It has been interesting to read the recent correspondence appearing in your *Journal* on the subject of mobile units, especially as everyone is not agreed as to the utility of these. The fully equipped and manned mobile unit consists of: (*a*) the personnel (a doctor, with one or more qualified nurses and lay persons trained in first aid); (*b*) the equipment; (*c*) the unit itself. As regards (*a*) it will generally be acceded that such a mobile personnel taken to the incident by car can be of great assistance in dealing with the injured: (*b*) this is at present carried in the unit, but such equipment could be taken to the incident by a light vehicle; (*c*) a mobile surgical unit large enough to accommodate patients during treatment might be of help at the incident, but many of the units now in commission are really not suitable for giving treatment in the unit itself, so that in such cases the only value of the unit is as a conveyance of equipment.

It would be interesting to have the views of medical men who have had actual experience with mobile units in action, especially as to whether the utility of the unit consists mainly in its transport value. Are many mobile units worthy of the label "mobile first-aid posts"?—I am, etc.,

J. F. MACDONALD.

Chelmsford, Feb. 8. Medical Officer of Health.

Certificates for Night-shift Workers

SIR,—It has come to my knowledge during my duties in connexion with industry that it is viewed with considerable concern that certain men and women wish to avoid their due share of night-shift working.

At the present moment the Government is insisting, not only on such night work, but upon a record being kept of the hours each machine is in use; and those who, for no real physical disability, acquire from their doctors certificates recommending that they be excused night work, not only throw vital production out of gear, but in certain instances provoke others to plead the same medical excuse, with increasing interference with output and unrest in the shop concerned.

I would therefore put in an earnest plea for my colleagues in the profession to give such certificates only after satisfying themselves to the hilt that night work is definitely injuring the health of the individual worker.—I am, etc.,

Jan. 31. AN EXAMINING FACTORY SURGEON.

Medicine in a Changing World

SIR,—With reference to your leading article "Medicine in a Changing World" (January 18, p. 91), the first part of Sir John Orr's statement, "The medical profession contains within it experts on every subject that affects human welfare," members of any other profession or organization could lay claim to a similar statement, but public opinion, I think, would be against it in either case.

The second part of Sir John's statement, "It is the only organized group of men competent to make a statement on human needs," would, if true, place the onus of all economic and political affairs on the medical profession. On the economic side it is not pleasant to read in Sir John's statement that "the profession has been too much occupied with its own remuneration and failed to recognize its responsibilities towards the bigger issues of national life."

I think your leading article sums up the case clearly, and the majority would agree that "the cobbler must stick to his

last"; it does not suggest that any influence should be brought to bear on any individual or group of members of the profession regarding their political opinions, as some of the correspondence against the leading article implies. Probably those best qualified to speak on economics will be found in the ranks of general practitioners and the country doctors; they have the day work and most of the night work to do, which possibly explains why they are generally silent on these matters; however, I feel it would be the general opinion that it is no concern of medicine to take part in economic or political affairs.—I am, etc.,

Exmouth, Feb. 3. FREDK. COCK.

SIR,—Several contributors have justly criticized your editorial regarding the obligations of the medical profession to state Man's minimum needs and to exert its influence under our democratic political system to get these satisfied. I wish particularly to support the plea of Dr. F. Dillon (January 25, p. 132) that politics be no longer regarded as only a plaything of political parties. Even the most extreme form of *laissez-faire* demands some sort of communal administration. Recent trends, however, show that in future, from necessity, more and more control of the activities of the community must be exercised by national and international Governments and legislatures. Are these to frame their policies according to reason and by scientific methods with full knowledge of the facts? Surely in our own province it is the duty of our profession, collectively and individually, to see that they do. An enormous amount of research is being carried on to rid mankind of the ravages of disease. But what facilities for research are provided for studying ways of curing these social and economic ills which are of far greater importance as destroyers of human well-being than disease? Such research ought to be carried out on a scientific basis independently of political parties with their fixed dogmas.

As an alternative to Hitler's New Order there has got to be offered a new system of democracy, purged of the inadequacies of the old and guaranteeing the minimum necessities of life to all. Only thus can democracy regain support in Europe. I should like to point out that there is already a movement, federal union, run on a non-party basis, advocating a European democratic system to replace that of Fascism. The federal Government that it contemplates would have powers and obligations to ensure that all citizens were guaranteed the minimum necessities of life, including medical attention, by making the satisfaction of these needs the first call on the resources of the community.—I am, etc.,

London, Feb. 5. D. G. FF. EDWARD.

Medical Planning Commission

SIR,—Since the announcement of the Commission in the *Supplement* of January 4 much correspondence upon the matter has appeared in the *Journal*. This correspondence reveals serious doubts about both the adequacy and representative character of this important body. These doubts have had particular reference to the preponderance of elderly members. These doubts may or may not be removed, but if we may judge from past experience of centralized committees it is safe to predict that the main part of the Commission's work will be done by a small group who are able to meet regularly. It is also safe to suppose that this group will be composed mainly of London members and of the older provincial members. Time and distance under war conditions will prevent the younger and more professionally active members from taking more than a perfunctory part in the proceedings.

We are told that the visions and aspirations of the younger men and women will not be overlooked. This sounds much more like a condescending gesture than an invitation to co-operation. Indeed, it suggests rather that it is the intention of the promoters that the Commission shall be dominated by the "less younger" of our colleagues.

The fear that the profession will be faced by a *fait accompli* has already been expressed. But even this is perhaps not the greatest danger. Surely the most serious result of an unrepresentative report is the deep division within the profession which it is likely to produce. The spectacle of a divided profession is not one likely to dispose Parliament to give that consideration to medical opinion which is desirable. Better no report than a disputed report. Is this now inevitable? One can but hope that it is not. Is it too late to urge the reorganization of the Commission on a regional basis? It is widely believed that a regional medical service has the best prospect of success, and in any event regional problems and conditions must be given full and knowledgeable consideration. Adequate representation, backed by the regular attendance of members, would be ensured, and an agreed report could be expected.

The suggestion is that seven or eight regional committees, preferably elected, would be set up, together with several special committees to deal with specific problems. These committees would work simultaneously according to an agreed programme, and report at regular intervals to a central body which would be composed of representatives of the committees together with an equal number of members nominated by such bodies as the Royal Colleges, the Medical Schools, and the B.M.A. The chairman could profitably be a wise and judicial layman. The function of this central body would be the progressive integration of the committee reports into a balanced whole. The widest publicity in the medical press throughout the proceedings is an essential feature.

It is considered that the less frequent meetings of this much smaller body need present no obstacle to regular attendance, especially if the provincial members were compensated for their time and their expenses defrayed, as indeed is only fair.

It is true that the B.M.A. has promised that Divisions and Branches "will have a chance to study and if necessary to criticize" the findings of the Commission. But if this is to be considered as a method of discovering and focusing the considered view of the profession on the vast problems under discussion, it is surely a *reductio ad absurdum in excelsis*. What Division or Branch, faced with a document of 300 or 400 pages, could adequately digest, let alone criticize, it within a reasonable time? And if they could, what effect are their several and possibly diverse critiques likely to produce? We all know the answer. Furthermore, not all the members of the profession are members of the B.M.A. or other bodies represented on the Commission as at present constituted.

We have a chance to mould a future National Medical Service. Let us not lose it.—I am, etc.,

Newcastle-upon-Tyne, Feb. 1. A. G. OGILVIE.

SIR,—It is with some disappointment that many of us have read the list of those whom the B.M.A. have selected to plan for the future of our profession. We did not expect that so many of what may be termed without disrespect "the old crowd" would be again called together to form the key personnel of this planning commission, whose decisions will be of such vital importance to most of us.

It is specifically mentioned that "much thought has been given to the age distribution of members of the commission." I have ventured, therefore to determine this, so far as is possible from reference books. This research yields the following results: of the fifty-seven members whose names are given, seven appear to be over 70. There are six between 65 and 70; nine between 60 and 65; eighteen between 50 and 60; eighteen between 45 and 50; and eleven under 45.

Sincerely as I value the experience which a ripe maturity can contribute to most problems, I would venture to maintain that it is the "under forty-fives" who should be chiefly represented where the issue is the future environment in which they are to live their lives and practise their art after this war. We shall no doubt be told that "youth" will be further represented on the subcommittees; nevertheless I would suggest that it would be better to reverse the principle, and see to it that "age and experience" were adequately represented on the subcommittees, and that the main body of the Commission should represent an average age not higher than (say) 50 years.

A further point causes me some surprise. The medical personnel of the Forces must by now represent the largest form of State medical service in this country. I see no representation of this important new body of opinion, many of whom are perhaps more concerned as to what the future holds in store for them than are their colleagues who still remain in civil life. It seems certain that many of these men who now have experience of both civil and State-controlled medicine might have much to contribute to the deliberations

of such a commission in view of the rapid and enlightened development which is still taking place in this sphere. Many of them are contributing actively to this development. It would appear that the B.M.A. are themselves not yet fully aware of the extent of this, and I may perhaps be permitted to quote some recent words of Prof. F. A. E. Crew, F.R.S. (in the opening contribution to a discussion arranged by the Edinburgh Branch of the B.M.A.). He said: "When I look around the [Army] Medical Services as they are even now taking shape, I marvel at their comprehensiveness and their promise of completeness, at the simple beauty of their design and the efficiency of their functioning. And I am led to wonder whether we as a society can ever be content to let this organization disintegrate when the war ends."—I am, etc.,

Jan. 19. W. S. C. COPEMAN, M.D., F.R.C.P.

Tobacco and Symptoms of Duodenal Ulceration

SIR,—With regard to dyspepsia in the Army, which you have been discussing recently in your columns, I can from personal experience confirm the fact that one can have symptoms almost, if not quite, identical with those of duodenal ulcer and yet no ulceration be present.

There are a number of factors which contribute to the development of these symptoms in a soldier—nervous excitement, overwork and worry, diet, etc.—but there is one serious exciting and aggravating cause—namely, cigarette smoking. Before the French collapse a kind friend sent a million cigarettes to the troops in France, and I feel sure that most physicians would agree that a million glucose sweets or malted milk tablets would have been a much better gift, and could be made just as popular among friends. I think it a decided disservice to our men to encourage this cigarette smoking, which would not be tolerated in the case of athletes or when perfect training was desired, which it should be in the case of soldiers. We must not allow the apparent unkindness of depriving our gallant men of the comfort of their cigarette to blind us to the bigger and more important question of their highest physical fitness and welfare.

One final point: it is sometimes forgotten that belladonna is most valuable in relieving the spasm which is an underlying factor in these cases.—I am, etc.,

Ilford, Feb. 5. N. BEATTIE.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on February 4 an offer from Viscount Nuffield to give to the University £25,000 to encourage research in ophthalmology was gratefully accepted. Arising out of this, a decree was adopted authorizing the appointment of a research assistant to the Margaret Ogilvie Reader in Ophthalmology for a maximum of five years and at a salary not exceeding £600 a year, and providing money from the residue of the gift for accommodation, equipment, and staff. The duties of the person holding the new post will be to assist the Reader in researches, whether of a clinical nature or otherwise, into the causes and cure of diseases affecting vision, and if he is a medical practitioner he will be debarred from private practice while in office.

In Congregation on February 18, at 2 p.m., a statute will be brought forward declaring that a candidate for the degree of Bachelor of Medicine shall not be allowed to sit more than three times for the examination in human anatomy and human physiology in the First Examination for that degree without leave of the Board of the Faculty of Medicine. If the statute is approved a decree will be proposed that it shall not apply to any person matriculated before Hilary Term, 1941.

Dr. William Brown has been reappointed Wilde Reader in Mental Philosophy for five years from June 9, 1941.

The Theodore Williams Scholarship in Pathology, 1940, has been divided between M. P. Lewis, B.A., and R. G. Ladkin, B.A.

UNIVERSITY OF CAMBRIDGE

In Congregation on February 7 it was resolved that the First M.B. Examination shall begin on March 17 in the present term, and on October 2 in the Michaelmas term of this year.

The following medical degrees were conferred:

M.D.—*O. N. Roussel.

M.B., B.Chir.—*W. E. D. Maile, *H. D. S. Vellacott, G. E. H. Emerson, D. N. White.

* By proxy.

During January the titles of the degrees of M.B., B.Chir. were conferred by diploma on P. G. Holman of Newnham College.

Congregations during the present term will be held on Saturday, March 1, and Friday, March 14, at 2 p.m.

The Services

D.D.M.S., SCOTTISH COMMAND

Brigadier J. A. Manifold, D.S.O., late R.A.M.C., has been selected for promotion to major-general on March 1, when he will take up the appointment of Deputy Director of Medical Services, Scottish Command. He will be succeeded as Director of Hygiene, the War Office, by Brigadier D. T. Richardson, M.C., late R.A.M.C.

D.D.M.S., EASTERN COMMAND

Brigadier O. W. McSheehy, D.S.O., O.B.E., late R.A.M.C., has been selected for promotion to major-general on March 26, when he will take up the appointment of Deputy Director of Medical Services, Eastern Command. He will be succeeded as Deputy Director-General, Army Medical Services, the War Office, by Brigadier A. Hood, C.B.E., late R.A.M.C.

EFFICIENCY DECORATION

The King has conferred the Efficiency Decoration of the Territorial Army on Colonel John Elvin Rusby, M.C.; Lieut.-Colonels Joseph Alexander Bingham, David Justin Davies, and Maxwell Hamilton Summers; and Temporary Lieut.-Colonel David Saunders Jones.

MENTIONS IN DISPATCHES

Corrigenda

In the list of officers whose names have been brought to notice in recognition of distinguished services in connexion with operations in the field, March to June, 1940, published in the *Journal* of January 4, the name of Lieut. H. L. Connor, R.A.M.C., was omitted, and the initials of Major Y. Moore and Lieut. A. E. Burgess, R.A.M.C., should read Major J. Y. Moore and Lieut. W. M. Burgess, R.A.M.C.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Probationary Temporary Surgeon Lieut. CHARLES LEON PRETRE, R.N.V.R. (H.M.S. *Acheron*), is posted as "Missing, Presumed Killed" in an Admiralty Casualty List published on February 4. He qualified M.R.C.S., L.R.C.P. in 1939 and his home was at Dagenham.

Surgeon Lieut. GEOFFREY RAYMOND EDWARD MAXTED, R.N.V.R., died on active service in December, 1940, aged 26. He was the younger son of Dr. and Mrs. E. B. Maxted of Clifton, Bristol, and was educated at Bristol University, where he graduated M.B., Ch.B. in 1938.

Surgeon Lieut. ROBERT DUDLEY ROPER, R.N.V.R., has died suddenly, aged 34. He was the son of the late Dr. H. J. Roper, who died in 1938, and was educated at Cambridge University, where he graduated B.Chir. in 1933, and at St. Bartholomew's Hospital. He also took the M.R.C.S., L.R.C.P. in 1933 and the Cambridge M.B. two years later. He had held the posts of house-surgeon to the ear, nose, and throat department and resident anaesthetist at Charing Cross Hospital and casualty house-surgeon and clinical assistant to the skin department at St. Bartholomew's Hospital. Before the war he was honorary anaesthetist to Charing Cross Hospital, the Hospital of St. John and St. Elizabeth, and the Connaught Hospital.

ROYAL AIR FORCE

The death is announced, in January on active service, of Flying Officer ARTHUR RICHARD YATES of Sisland, near Loddon, Norfolk. He qualified M.R.C.S., L.R.C.P. in 1935. He leaves a widow and two children.

ROYAL ARMY MEDICAL CORPS

The name of Lieut. FRANCIS CUTHBERTSON MCLAREN is included as "Died" in an Army Casualty List published on January 31. He was the son of Mr. and Mrs. T. McLaren of Broughty Ferry and was educated at Glasgow University,

where he graduated M.B., Ch.B. in 1938. After filling the posts of house-surgeon at Victoria Infirmary, Glasgow, and junior assistant medical officer at the North Middlesex Hospital, London, he recently joined the R.A.M.C. He leaves a widow.

DEATHS IN THE SERVICES

Colonel ROBERT WILLIAM CLEMENTS, C.M.G., D.S.O., late *R.A.M.C., died at Ootacamund, Southern India, on January 22*, aged 70. He was born at Pomeroy, Co. Tyrone, on April 7, 1870, was educated at Queen's College, Galway, took the M.B., B.Ch., B.A.O. of the Royal University of Ireland in 1895, and the Cambridge D.P.H. and the Liverpool D.T.M. in 1906. Entering the Army as surgeon lieutenant in 1896, he became lieutenant-colonel in 1915, colonel in 1917, and retired in 1922. He served throughout the war of 1914–18 and was mentioned in dispatches five times, receiving the D.S.O. in 1917 and the C.M.G. in 1918. After retirement he settled in India.

Fleet Surgeon WILLIAM GORDON STOTT, R.N. (ret.), died at Aberdeen on February 5. He was educated at Aberdeen University, where he graduated M.B., C.M. in 1885, after which he entered the Royal Navy, becoming fleet surgeon in 1903.

Obituary

SIR WILLIAM HORROCKS

Sir LEONARD HILL sends the following appreciation of the late Sir William Horrocks:

As a member of the Army Medical Advisory Board I was associated with the late Colonel Horrocks under Sir Alfred Keogh, who was Director-General, A.M.S., when the Germans made their first gas attack in the last war and very nearly broke through the line. Means had to be taken at once to provide defence against gas. A German submarine had been lately captured in which muslin face masks were found, and at the instigation, as I was told, of the First Lord of the Admiralty (then Mr. Winston Churchill) the women of England were thereupon asked to make such masks. These obviously were no good: meanwhile Horrocks designed the flannel hood respirator, which covered the whole head and was fitted with eye-pieces and impregnated with suitable chemicals for absorbing gas. Breathing took place through the pores of the flannel. This respirator was used successfully until the box respirator could be designed and manufactured. So that no time might be wasted over official financial delay, Horrocks told me he had gone out and ordered the flannel on his own responsibility. He carried out very valuable work in initiating the Chemical Warfare Committee and in furthering generally the hygiene of the Army. His son was taken prisoner, and he told me a code had been prepared in case of need by which his son was able to communicate safely with him. Horrocks also told me that his work in Malta had made clear that Mediterranean fever was transmitted by goats' milk, and so brought about the means of prevention. Bruce communicated this discovery in England, and Horrocks felt strongly that credit had not been justly accorded to him. Up to his death he had continued to edit the *Journal* of the R.A.M.C. His services to the Army and to medical science were very great.

JAMES ALLAN, M.D., D.P.H.

Dr. James Allan, who died at his home in Roundhay, aged 88, was for half of his long life medical superintendent of St. James's Hospital, Leeds, and one of the best-known medical officers in the North of England. At the time of his appointment the Leeds Workhouse Infirmary, as it was then called, was insufficient in many respects. A complete transformation took place and room was gradually made for 1,200 patients, including 200 mental cases, while notable changes were made in the class and number of nurses and in the provision made for them. When he retired in 1925 an unusual honour was paid him by the unveiling of a tablet recording his manifold services as medical superintendent, and the late Lord Moynihan spoke in warm terms of his work, saying that tens of thousands of patients had passed through Dr. Allan's hands.

James Allan graduated M.A. at the University of Aberdeen in 1874, M.B., C.M., with honours, in 1877, and M.D. in 1880; twenty years later he took the Cambridge D.P.H. Before his appointment in 1881 to the post at Leeds he had been assistant medical officer at the Wandsworth Infirmary and house-surgeon and house-physician at the Northern Hospital, Liverpool. He was for many years an active and zealous member of the British Medical Association, joining it in 1882. He represented the Leeds Division at sixteen Annual Meetings, was honorary secretary of the Division for twenty-five years (1906–31), and chairman in 1932–3. His colleagues of the Yorkshire Branch of the Association elected him president in 1921; he was also a past-president of the Leeds and West Riding Medico-Chirurgical Society.

ANDREW SPROTT, M.B., C.M.

We regret to record the death on January 29 of Dr. Andrew Sprott from coronary thrombosis. He had been in failing health during the last twelve months, but his death came with painful suddenness to his many friends in Appleby and the surrounding district, where he was held in the highest esteem and universal affection.

Andrew Sprott came of an old Galloway family. He was born 74 years ago in Wigtownshire, where his father was a well-known farmer who died young, but not before his eldest son developed a knowledge and love of beasts, birds, and flowers surpassed by few, and, furthermore, a capacity for painstaking hard work, a patient zeal and understanding of his fellow men which made him beloved by all with whom he came in contact. He graduated M.B., C.M. at Glasgow University in 1887, and started his professional career in a large country practice as assistant to the late Dr. J. W. Fawcitt of Broughton-in-Furness, and between these two there sprang up a friendship and affection which lasted throughout life. He married his friend's sister, Annie, with whom he had an ideally happy life. He then proceeded to Glenridding, on the shores of Ullswater, where he carried on the wild country practice often under hazardous conditions, but where, also, he found occasional time for his favourite sport of fly-fishing. With the advent of a young family, he transferred his activities to Appleby, the county town of Westmorland. There he built up a large and successful practice (from which he retired three years ago) and a reputation as a good doctor of outstanding kindness and integrity. He was a man of great ability and courage, who spared no effort on behalf of his patients: he was painstaking in the establishment of the diagnoses of his cases, and followed up accurate diagnosis with up-to-date treatment. He had a vivid interest in modern methods and was never behind the times in spite of his fifty years of practice. During the war of 1914–18 he was responsible for the establishment of a Red Cross hospital in Appleby, of which he was the medical officer, eventually becoming county director of the British Red Cross Association. He also took a great interest in the St. John Ambulance Brigade. He was a member of the British Medical Association for thirty-three years.

On his retirement the people of Appleby and district made him a presentation on such a generous scale that he was positively embarrassed, and in his modest way he said to the writer, "I never expected or deserved this." He was a great gardener and a great botanist. His keen interest in botany was a source of joy which he shared with his wife, his daughter, and his invalid son, who died some eighteen months ago after fourteen years in bed as an indirect result of his service during the last war. His eldest son died on active service in Mesopotamia in 1917. He is survived by his widow, a daughter, and son who lives in the Far East.

Dr. ALEXANDER GUNN AULD, who died at the end of January in his eighty-first year, is likely to be remembered for his work on asthma, hay fever, migraine, and related diseases. From quite early days, alike in the laboratory and at the bedside, he made these topics his peculiar province, and

it was along a strict line of scientific inquiry that he reached the practice of what he named pyrogenic therapy—that is, the introduction of peptones and allied bodies into the blood stream. In his hands the practice had a large measure of success, and its value has been widely recognized by other workers. The record of Auld's researches and teaching is to be found in his book entitled *Asthma, Hay Fever, Migraine and Allied Diseases*. It is with this contribution to practical therapeutics that his name is particularly associated. Personally his habit of mind was almost severely scientific and he cultivated philosophy and literary ambitions; for some years he was the editor of the *Medical Magazine*. His professional qualifications included M.D.Glasg., M.R.C.P.Lond., D.P.H. Oxon. He had been a member of the council of the London and Counties Medical Protection Society, and was for some years a lecturer on clinical medicine and pathology at the North London Postgraduate College.

The death occurred in January from enemy action of KERIDWEN ST. VALENTINE ARMSTRONG, M.D., D.P.H., while on duty for the Emergency Medical Service. She was the wife of Dr. J. V. Armstrong. Keridwen Edwards came to University College Hospital from Cardiff University in 1919, and so was among the first group of women students admitted to that hospital. She gained the Liston gold medal in surgery and qualified in 1921 shortly after her twenty-first birthday. After resident appointments at King Edward VII Hospital, Windsor, the Evelina Hospital for Children, Glan Ely Tuberculosis Hospital, Cardiff, and the ear, nose, and throat department of University College Hospital, she entered the L.C.C. Fever Hospital Service and was appointed to the Grove Hospital, Tooting. She spent a year at Queen Mary's Hospital for Children, Carshalton, before her marriage in 1934. That is her medical record, and certainly it indicates the length and breadth of her service as a doctor. Her friends, however, will find interest and comfort in the fact that the war which has now taken her life gave her opportunity to practise that particular branch of medicine which had always appealed to her as her especial vocation at the outset of her career. The hospital of which her husband is the medical superintendent was incorporated into the Emergency Medical Service, and her part within that organization was with the orthopaedic unit. She was thus able to use and develop her talents in a sphere where she was most conscious of her skill. Mrs. Armstrong had, however, a place among her friends which even surpassed her place in her profession. She first appeared as a pretty and eager young woman, younger than her contemporaries and challenging in her outlook. To immature medical students the challenge was at first disconcerting, but her charm and her mental integrity, as well as her competence, yielded to her all the sweet awards of work and friendship. And those qualities which showed themselves when she came from Wales and joined her fellow students at U.C.H. persisted throughout her life. Her death has broken a partnership which cemented two careers. The happiness of her married life, which delighted their many friends, served their work and gave benefit to all who knew them or were in their care.

The death occurred in January from enemy action of WINIFRED PORTER, M.B., Ch.B.Vict. Born in Leigh in 1909, she began her medical studies at Manchester in 1928. After qualifying in 1934 she had been house-physician to the South London Hospital and Victoria Hospital, Chelsea, and later resident medical officer to the Princess Louise Hospital. She was also resident medical officer to the Convalescent Home, Swanley. Dr. Porter was showing great promise as a psychiatrist, having studied her specialty at the Maudsley Hospital and later at the Retreat, in Yorkshire, from where she went to Cane Hill Hospital, Coulsdon. She had a very high reputation among the staff, being possessed of keen clinical acumen and marked practical ability. A colleague writes: The death of Dr. Winifred Porter has deprived the medical profession of a very promising young psychiatrist. She was a woman of exceptional intelligence and charm, beloved by colleagues and patients alike. In her work she was efficient and always to be relied on in an emergency. As an anaesthetist she was outstanding, and had a high reputation among the hospital staff and consultants. She had a sharp clinical acumen and a marked proficiency at getting straight to the core of any matter in hand. She always had the good of her patients at heart, and took a particular interest in the welfare of the nursing staff in her wards. Dr. Porter was a great lover of the truth and fearless in the expression of her opinions when she felt them justified. She was a true champion of the cause of liberty and would unhesitatingly have sacrificed her life if she had thought the cause would benefit. As it is her death is one more example of the cruel barbarism of indiscriminate bombing, which can gain our enemies nothing and only serve to steel us to endure to the end. Dr. Porter was engaged to Surgeon Lieut. K. O'Connor, R.N., and to him and her parents all those of us who knew her sterling worth tend our heartfelt sympathies.

We regret to announce the death in his eighty-eighth year of Sir JOHN MCFADYEAN, LL.D., formerly Principal of the Royal Veterinary College, who was vice-president of the Section of Pathology when the British Medical Association held its Annual Meeting in Edinburgh in 1898. His death removes one of the pioneers who built up veterinary science and changed the status of veterinary medicine. A native of Wigtownshire, he was born on June 17, 1853, and after training at the Edinburgh Veterinary College took the M.R.C.V.S. in 1876. Thereupon he entered as a medical student, graduating M.B., C.M.Ed. in 1882 and B.Sc. in the following year, and became lecturer on anatomy and pathology at the Edinburgh Veterinary College. His next post was that of dean of the Royal Veterinary College in Camden Town, London; when the chair of comparative pathology was established there he was appointed to it, and he served as Principal from 1894 to 1927. McFadyean edited the *Journal of Comparative Pathology and Therapeutics* for many years. With his medical and veterinary qualifications and his belief in the future of comparative medicine it was most appropriate that he should be invited to hold office at the Edinburgh Annual Meeting of the B.M.A. He was knighted in 1905 and the University of Aberdeen conferred its honorary LL.D. upon him.

Medical Notes in Parliament

Mr. James Griffiths has given notice that when the House goes into Committee on the Civil Estimates he will call attention to deficiencies of the National Health Insurance Act and move a resolution.

War Damage Bill

During the consideration of the War Damage Bill on February 5, Clause 29 (Property held for Charitable Purposes) was amended, on the motion of Mr. CHARLES WILLIAMS, to cover specifically any properties engaged in "the making of provision for the cure or mitigation or prevention of, or for the care of persons suffering from or subject to, any disease or infirmity or disability affecting human beings (including the care of women before, during, and after childbirth)." He said the amendment was to make clear that provisions for these women came under the Bill.

On Clause 42 (Insurance Schemes) Sir FRANCIS FREMANTLE moved on February 5 that "business" in this part of the Bill should include "any trade, profession, employment, or vocation." He said he was concerned to include in "profession" medical men. It was thought by the medical profession that it would be best to use the interpretation of the word "business" which was used in the Income Tax Act. The memorandum in the Bill said the word "business" did include professions, but there was nothing in the Bill to say so. Mr LYTTLETON said the word "business" covered the professions, and to introduce the words proposed by Sir Francis would legally be dangerous. Sir Francis withdrew the proposed amendment.

Medical Man-power

Mr. MANDER asserted on February 14 that widespread dissatisfaction at present existed in the medical profession with regard to the failure to utilize to the fullest extent the services of the medical profession in the national effort, owing

to lack of co-ordination and co-operation between the Emergency Medical Service, the medical services of the armed Forces, and the general body of civilian medical practitioners. He asked Mr. MacDonald to consider appointing a small non-medical committee to investigate the most effective organization for utilizing to the best advantage the medical services of the country. Mr. MACDONALD replied that the Service Ministers, the Secretary for Scotland, and he were not aware of any widespread dissatisfaction, but recently had the advice of a committee appointed to consider the steps necessary to secure a proper allocation of the available medical manpower between civilian and military services. The committee consisted of Sir Arthur Robinson, as chairman, and three medical men with wide experience of the various branches of the profession—namely, Sir John Fraser, Sir Kaye Le Fleming, and Prof. R. M. F. Picken. Their report was now receiving the active consideration of these Ministers.

Mr. MANDER offered to supply evidence of dissatisfaction.

Mr. WOODBURN asked Mr. MacDonald to induce the medical profession to relinquish some of its trade-union etiquette so that its work should be better spread over the population.

Butter Ration of Tuberculous Persons.—On February 11 Mr. PARKER asked the Parliamentary Secretary to the Ministry of Food whether a larger ration of butter could be provided for patients suffering from tuberculosis, as the present two ounces was insufficient for nourishment purposes. Major LLOYD GEORGE said that the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council was considering the position of invalids, including tuberculous patients, in the light of the present food restrictions.

Medical News

The Hospital for Sick Children, Great Ormond Street, would like members of the medical profession to know that through the kind co-operation of the Watford Peace Memorial Hospital it has been found possible, as a wartime measure, to open consultative out-patient clinics there. At first clinics will be held once a week, beginning on Friday, March 7. Medical and surgical cases should attend at 10 a.m. and ear, nose, and throat cases at noon. These clinics will be extended later if necessary. The clinics will be conducted by members of the visiting medical staff of the Hospital for Sick Children, and new cases must be recommended by a doctor. Appointments should be made by letter through: The Almoner to the Hospital for Sick Children Clinic, Watford Peace Memorial Hospital, Watford, Herts.

The University of Manchester has arranged a week-end course on factory medical services for medical practitioners. It will be held on Saturday and Sunday, March 1 and 2, and the fee is one guinea. Full details of the course may be had from the Director of Extramural Studies, The University, Manchester, 13.

Surgeon-General Thomas Parran, of the United States Public Health Service, will be entertained at luncheon by the Society of Medical Officers of Health on Friday, February 21, at the Piccadilly Hotel, W., at 12.45 for 1 p.m. Tickets (7s. 6d., including wine and gratuities) are obtainable by members of the Society from the acting Executive Secretary at Tavistock House South, Tavistock Square, W.C.1, not later than February 19. Members may be accompanied by one representative of their local authority.

A meeting of the Shaftesbury Military Hospital Medical Society will be held at the hospital on Tuesday, February 18, when Colonel L. E. H. Whitby will give an address on "Transfusion for War Conditions."

The Medical Women's Federation is arranging a course of six lectures on social anthropology to be given at the London School of Hygiene and Tropical Medicine from March 3 to 8 at 4.30 p.m. It is intended mainly for doctors and nurses working over-seas, but members of the public will be welcome. Fee for the course is 1½ guineas, with a reduction for missionaries. Tickets and further information may be obtained from Dr. Margaret Balfour, 14, Sylvan Road, Upper Norwood, S.E.19, or at the first lecture.

A meeting of the Faculty of Radiologists will be held at 32, Welbeck Street, W., on Friday, February 21. At 10.30 a.m. the Therapy Section has arranged a discussion on "The Organization of Radiotherapy in Wartime," to be opened by Mr. Malcolm Donaldson, followed by Mr. E. Rock Carling, Mr. G. F. Stebbing, and Dr. Ralston Paterson; at 2 p.m. the Skinner Lecture on "Cancer of the Bladder" will be delivered by Dr Ralston Paterson; and at 3 p.m. before the Diagnostic Section there will be a demonstration on "The Anatomy and Radiology of the Bronchial Glands," by Dr. Stefan Engel. A discussion will follow. Copies of the report of the discussion on the organization of radiotherapy in wartime will be available to members in due course at a cost of 2s. each. Members requiring copies should apply to the secretary.

Applications are invited for Leverhulme fellowships or grants in aid of research, intended for senior workers who are prevented from carrying out research work by routine duties or pressure of other work. The trustees are also prepared to consider applications from groups of workers engaged upon co-operative programmes of research, particularly from those engaged upon long-distance programmes or in institutions in which the normal facilities for research have been curtailed by the war. Forms of application, returnable by March 1, may be had from Dr. L. Haden Guest, M.P., Kinscote House, 1, Watergate, Blackfriars, London, E.C.4.

Diabetics, who already have triple rations of butter and margarine, are now to have a triple meat ration; information to this effect has been sent to local food committees. The Ministry of Health has recently emphasized the need for those who regularly take insulin, and who therefore would run special risks should they become air-raid casualties, to carry on their persons some indication that they are diabetics. They can obtain from the Diabetic Association, 124, Baker Street, London, W.1, on receipt of a stamped addressed envelope, a suitable card for carrying inside their identity card on which can be written the usual dose of insulin, the treatment for an overdose, and their medical adviser's name and address.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

During the week under review there were increases in the incidence of cerebrospinal fever, enteric fever, and pneumonia (primary and influenzal) in England and Wales and in Scotland, where increases in notifications of measles and whooping-cough were also recorded, but these may be due rather to an extension of the system of notification or "intimation" than to an actual high increase.

Influenza for Week Ending February 1

The return of influenza deaths for the week ending February 1 for the 126 great towns, 176, again almost precisely repeats the figures of 1929; in that year we had 99, 122, 179, and, in this year, 99, 120, 176. At first sight this is ominous, for in 1929 influenza became very severe. But in that year 99 was reached a fortnight earlier, and time is an important element. In general, the later a recrudescence begins the less likely is it to reach severe proportions. The most recent returns for London show a reduction in the numbers of daily admissions to hospital of cases of influenza, bronchitis, and pneumonia cases. It now appears probable that there will not be a sudden great rise in influenza deaths, but mortality is likely to continue to increase. The age distribution of the deaths is of the normal type. 56% are at ages over 65 and 5% at ages under 25. In the corresponding week for 1939 deaths from influenza numbered 210, and, for 1940, 353.

Total of Influenza Deaths and Deaths in Age Groups in 126 Great Towns for Week Ending February 1

All Ages	A Under 1 year	B 1-5	C 5-15	D 15-25	E 25-35	F 35-45	G 45-55	H 55-65	I 65-75	J 75 and over
176	5	—	—	4	7	10	18	33	53	46

Regional Totals of Influenza Deaths for Week Ending February 1

South-Eastern Area:		Midland Area	23
Greater London .. 86 } =	100	Eastern Area	4
Rest of S.E. .. 14 }		South-Western Area	5
Northern Area	56	Wales and Monmouthshire ..	1
			190

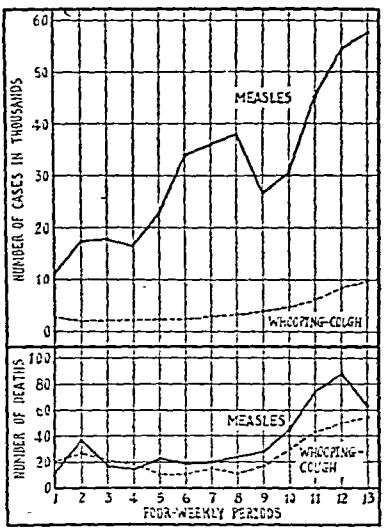
Total for 126 Great Towns including the Outer Ring

Cerebrospinal Fever

The incidence of cerebrospinal fever has been increasing and it is more prevalent than last year (266 notifications as against 107); a steep rise was then noted in the last week of January and the peak reached in the week ended March 2, the decline of the epidemic was much more leisurely and more irregular than its rise. With prompt diagnosis and adequate treatment the case fatality rarely exceeds 5%. The number of administrative health areas affected rose from forty-one to forty-four, in eighteen of which more than 5 cases were recorded—namely, Lancaster 46, York, West Riding, 22, Warwick 19, Gloucester 14, London 14, Glamorgan 12, Wiltshire 9, Southampton 8, Surrey 8, Durham, Essex, and Kent 7 each, Derby, Middlesex, Northampton, Nottingham, Yorks, North Riding, and Monmouth 6 each. The notifications for the week ending February 1 (just received) were 326.

Measles and Whooping-cough.—The fall in the incidence of measles and whooping-cough, which remain by far the most prevalent acute infectious diseases in this country, and the generally low case fatality of both diseases are gratifying in view of the abnormal conditions under which many of those at risk are living.

During 1940, as the accompanying graph shows, measles steadily gained ground: a marked decline occurred in the four weeks August 3 to August 31, which is probably due to extrinsic factors rather than to changes in the virulence or dispersal potential of the causative organism. This fluctuation in the epidemic curve found no counterpart in the deaths in the principal towns. Despite the increase of the



Graph showing cases of and deaths from measles and whooping-cough in the thirteen four-weekly periods in 1940 (cases for England and Wales and deaths in the 126 principal towns).

disease and the prevalence of catarrhal infections, measles proved less fatal towards the end of the year; there has been a tendency towards a higher case fatality in recent weeks, but exact observations are impossible as returns for deaths are available only for the principal towns. The uniform low curve of whooping-cough is in sharp contrast to that of measles. Concurrent respiratory infections are of less moment in measles than in whooping-cough, which is a mild disease in summer and deadly in winter. Measles is potentially dangerous to the young at any season, but in recent years has been remarkably mild, for which a complete explanation is not yet forthcoming. Improved nutritional standards, increased facilities for home nursing and hospital treatment, probably all play their part.

No. 2

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended January 11, 1941.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash—denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	(b)	(c)	(d)	(e)	1940 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	266	14	49	1	12	107	5	23	8	—
Deaths		1	1				3	—		
Diphtheria	1,233	40	377	21	35	745	27	204	65	43
Deaths	43	3	16	1	1	17	—	5	1	1
Dysentery	93	8	33	—	—	31	3	13	—	—
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	2	—	—		—	8	—	—		—
Deaths		—	—				—	3		
Enteric (typhoid and paratyphoid) fever	30	3	4	3	1	11	1	2	—	4
Deaths	—	—	—	—	—	—	—	—	—	—
Erysipelas		23	68	7	7			67	8	7
Deaths		—	—				—	1		
Infective enteritis or diarrhoea under 2 years	36	4	11	4	1	32	3	11	5	3
Deaths										
Measles	15,413	440	353*		11	2,740	33	27		278
Deaths	23	1	5	1	—	1	—	1	2	3
Ophthalmia neonatorum	73	1	8		—	66	9	15		1
Deaths										
Pneumonia, influenzal†	1,465	79	24	7	11	1,457	59	63	12	9
Deaths (from influenza)	69	9	8	6	1	158	14	38	2	7
Pneumonia, primary			268	57				545	17	
Deaths		74		15	9				19	6
Polio-encephalitis, acute	—	—				4	—			
Deaths		—					—			
Poliomyelitis, acute	5	—	6	—	—	6	—	—	—	—
Deaths		—	—				—	—		
Puerperal fever	—	—	13	2	—		4	7	3	1
Deaths		1					1‡			
Puerperal pyrexia	119	—	14		2	159§	7	12		1
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,164	77	174	47	46	1,141	38	154	64	54
Deaths	1	—	—	—	—	1	—	1	—	1
Small-pox	—	—	—		—	1	—	—		—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	2,761	30	320*		31	787	22	23		14
Deaths	22	2	14	3		5	—	—	—	—
Deaths (0-1 year)	484	39	96	39	16	415	62	96	37	22
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	7,251	1,026	1,034	284	159	5,269	1,550	1,215	312	174
Annual death rate (per 1,000 persons living)			22.5	18.9	16.6			24.6	20.3	15.3
Live births	5,418	333	922	316	223	5,663	2,049	902	339	263
Annual rate per 1,000 persons living			18.7	21.0	19.5			18.3	22.6	23.1
Stillbirths	217	13	42			259	29	50		
Rate per 1,000 total births (including stillborn)			44					53		

* Notification in certain administrative areas only.

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

‡ Death from puerperal sepsis.

§ Includes figures for puerperal fever.

with it is a matter of some difficulty, and we have awaited the report of the Shakespeare Commission before coming to a final conclusion.

It has now been decided that it is not necessary and would not be right to establish a new medical service on the lines suggested by your Association, as was done in the case of the unaccompanied children, and that the proper course is to ensure that the existing medical service provided by the public assistance authorities is readily available for the class in question. In November last we urged public assistance authorities to review their services, and we have recently circularized them again on the same matter, informing them, among other things, that we would entertain proposals for the "open choice" system of Poor Law Medical Service if they regarded that as suitable. You will recollect that your Association suggested this system in your letter of October 2, 1939.

I may add that the new advice to public assistance authorities goes in one respect further than the suggestions made by your Association, since it has now been indicated that they will be reimbursed for their expenditure in providing medical services for persons privately as well as persons officially evacuated.—Yours sincerely,

E. J. MAUDE.

The Ministry of Health circular (dated February 4) to which reference is made in the Ministry's letter is Circular 2283, which is given in full below:

EVACUATION: HEALTH AND WELFARE SERVICES

1. I am directed by the Minister of Health to state that he has had under review the arrangements for the provision of health and welfare services for evacuated and homeless persons who come into a local authority's area.

2. In the circular of November 16, 1940 (Circular 2204, with which the present circular should be read), the Minister indicated that, in addition to the special services (such as sick bays) provided in connexion with evacuation, all the local authorities' normal health and welfare services should be fully extended to all evacuated and homeless persons coming into their areas—whether billeted or privately accommodated—in the same way as to the ordinary inhabitants, and that the newcomers to the area should be acquainted with the services available.

Reimbursement of Expenditure to Local Authorities

3 While proper economy should be exercised in the provision of the services, the Minister is anxious that action on the part of receiving authorities should not be hampered by any misunderstanding as to the incidence of the cost. It has already been recognized that expenditure incurred in extending services for evacuated or homeless persons who are billeted or accommodated at the expense of the Government would be reimbursed under Section 56 of the Civil Defence Act, 1939.

4. The Minister has now decided that the same principle should be applied to the provision of services for persons who have temporarily left their homes in the evacuation areas and have made private arrangements for their accommodation in reception or neutral areas. He is therefore prepared to reimburse to local authorities in reception or neutral areas any net additional expenditure (less recoveries made from the persons concerned according to the authority's normal practice) incurred on or after September 1, 1940, in extending their health or welfare services (including any necessary extension of the District Medical Service of the Public Assistance Authority) to any persons who have removed from an evacuation area under private arrangements but whose residence in the new area may be assumed to be of a temporary kind. It is recognized that no hard-and-fast rule can be laid down for distinguishing between temporary and permanent removals, but in general a rough guide will be found in the answer to the question whether the person who has removed remains liable to pay any rent or rates in respect of his house in an evacuation area, or would be liable but for damage to the house owing to enemy action.

Domiciliary Medical Treatment

5. Domiciliary medical treatment for unaccompanied school children accommodated under the Government Evacuation Scheme will continue to be provided under the arrangements set out in paragraph 16 of Circular 1882. For insured persons medical attention is available under the National Health Insurance Acts, and, for those able to pay the necessary fees, by private practitioners in the normal way. For other persons provision will be made through the District Medical Service

6. In Circular 2204 Public Assistance Authorities were requested to have special regard to the provisions of an adequate District Medical Service to meet the needs of an increased population. It is important that the service should be readily accessible, and that the arrangements enabling the services of a doctor to be obtained should be as simple and expeditious as possible; this will be of particular importance in extensive rural districts in which the calls upon the service by the ordinary residents are few but which may have received considerable numbers of people who have been accustomed to rely on the District Medical Officers for any necessary domiciliary treatment.

7. In some areas it may be found convenient to provide the necessary service for evacuated persons by means of a panel of contracting general practitioners (generally known as the "open choice" system), while having due regard to the rights of existing District Medical Officers, and the Minister will be prepared, on application being made in each case, to consider the dispensations from the Public Assistance Order, 1930, needed to enable this course to be adopted.

8. The Minister requests that the authority will review the position and satisfy themselves that their arrangements are adequate to meet the needs of the situation. Wherever it is proposed to extend the service by additional appointments of temporary or assistant District Medical Officers, application should be made without delay to the Senior Regional Officer for prior approval.

Infectious Disease

9. Arrangements for dealing with infectious disease are of particular importance in view of the large numbers of children who have left evacuation areas during the last few months, and the fact that the months immediately to come are those in which the incidence of infectious disease is usually at its highest.

10. The authority will appreciate the importance of arranging for hospital treatment for the more serious cases which require such treatment. In so far as facilities in a particular district may not be adequate in the event of a local epidemic, they should make such arrangements as are practicable with neighbouring authorities.

11. While time and other factors will not permit of the building of new accommodation for immediate needs, existing hospital accommodation can be supplemented by the temporary use of existing buildings suitable for the purpose. If additional accommodation has to be improvised, either for cases of infectious disease normally treated in hospital or for cases of minor infectious disease which might not in ordinary circumstances call for removal to hospital but cannot be adequately nursed in billets, proposals for its provision should be submitted to the Senior Regional Officer.

12. The cost incurred in making the provision in paragraphs 11 and 12, and also in the provision of sick bays for the nursing of minor ailments on the lines indicated in Circular 2204, will, of course, fall within the general principles of reimbursement in respect of all local services laid down in paragraphs 3 and 4 above. The normal practice of the authority as hospital authority with regard to the recovery of cost or part cost of treatment in hospital should be applied to patients admitted for treatment or those responsible for them.

Other Hospital Treatment

13. The Minister has also reviewed the position with regard to the provision of hospital treatment for the various classes of evacuated persons. General hospital treatment is already provided, as a direct financial responsibility of the Minister, at hospitals within the Emergency Hospital Scheme for all unaccompanied evacuated children. It has now been decided that from the date of this circular the facilities available to unaccompanied children under the Emergency Hospital Scheme should be extended, so far as available accommodation at any time permits, to all other homeless and evacuated persons billeted or otherwise accommodated at the Government's expense, and also to those persons privately removing from evacuation into reception or neutral areas, who are defined in paragraph 4 above. Contributions to this cost of treatment will, of course, be recovered by the hospital from the persons concerned, in the case of all the additional classes covered by this extension, on the usual basis adopted by the hospital concerned. A more detailed communication is being sent on this subject to all local authorities with hospitals included in the Emergency Hospital Scheme and to voluntary hospitals so included.

14. Expenditure on institutional treatment provided by local authorities under a specialist service—for example, maternity, tuberculosis—or in general hospitals or institutions not in the Emergency Hospital Scheme will rank for reimbursement on the principles in paragraphs 3 and 4 above as additional costs incurred in extending local services.

General

15. In administrative counties the county council are responsible for some of the services mentioned in this circular, and the county district authorities are responsible for others. It is impor-

int that there should be effective co-ordination of these services, nd that the services available over the county as a whole should e used to the best possible effect. The county council have from ie outset assisted to this end in connexion with the Evacuation cheme, and it is considered that the county medical officer of ealth should, in consultation with the medical officers of health or the county district, be in a position to secure the most effective se of the medical and health services.

16. Evacuation areas for the purposes of this circular are the reas set out in Appendix A to Circular 2170 of October 8, 1940, ircular 2243 of December 18, 1940, and Circular 2277 of January 5, 1941, and any other areas subsequently declared to be evacuaon areas for the purposes of the Evacuation Scheme as from the ate of their declaration.

17. Expenditure in respect of which reimbursement is sought nder the extended arrangements (other than those for the admission f patients by the Emergency Hospital Scheme in paragraph 13) will equire the approval of the Senior Regional Officer of the Ministry or the Region concerned in the way prescribed for expenditure inking as an evacuation charge in Circular 1954 of January 22, 940.

18. Claims by authorities for the reimbursement of any additional xpenditure under this circular (other than those in respect of the dmission of patients by the Emergency Hospital Scheme under aragraph 13) should be submitted with the claims made in respect f expenditure incurred under Section 56 of the Civil Defence ct, 1939.

A copy of this circular is enclosed for the information of the inancial officer of the council, and a copy has been forwarded to he medical officer of health.

Correspondence

Occasion for Groans

SIR,—Recent letters in the *Journal*, in my opinion, rightly riticize the undemocratic "appointment" of a Commission to orrelate medical services. Again the general practitioner will e denied a full voice in matters which concern him and his atients most intimately. Another letter has raised the quesion of the inadequate capitation fee. I would draw attention o an increased burden of work which has not been stressed—amely, the ante-natal care of female insured persons. In my xperience these patients are being increasingly referred to heir "own doctor" for transient rises in blood pressure, *having been once under suspicion for toxaemia of pregnancy* hey are naturally a care and responsibility during the rest of heir pregnancy. My impression is that panel practitioners can through the correspondence page of the *Journal* during in odd moment of leisure and relaxation, heartily endorse nost of the complaints made by members, groan wearily at he unfairness of their lot, and retire to oft-interrupted lumber. There would be less occasion for groans if they trongly voiced their opinion to the executive officers of the Association and compelled them to take more interest in their pressing problems.—I am, etc.,

Jan. 31. JOHN J. FITZPATRICK.

Recruitment of Medical Students

SIR,—As the problem of man-power is again the subject of consideration by Parliament the following points submitted to a city Medical War Committee, who forwarded it to the University Faculty, may be of interest.

1. Now that the medical profession is selectively conscripted it is neither right nor just to exclude the medical students registered before the war from this method of recruiting.

2. Since the matriculation examination has been abolished for entrants to degree courses at Northern universities and one or two years' subsidiary study has been substituted the degree student taking this longer curriculum is at a disadvantage in competing with his colleagues for licence examinations with their lower standards of entry. In consequence few degree students are able to complete the five terms necessary for exemption before attaining the age of 20.

3. The inequity of the five-term system is emphasized by the irregularity of the calling-up dates and the wide variation in the dates of university terms. (The student who fails repeatedly after completing five terms has an advantage over his brilliant colleague.)

4. A recent B.M.A. circular stated that non-military medical posts require 3,700 doctors annually, and only 2,400 qualify annually. If the present method of recruiting students continues the supply of doctors will be decreased further.

5. The earlier that anatomy and physiology courses are completed the sooner the students could be employed at clinical work in war hospitals. At present the bombing of large teaching centres has reduced the facilities for study, already more difficult by the mental strain of war circumstances.

6. The leaders of the profession have a definite obligation to the community and are responsible for safeguarding the future of the profession by ensuring that the best type of entrant of high standard is not lost to the profession. Other professions and skilled industries have urged similar claims for their pupils and apprentices. It is suggested that each Local Medical War Committee should bring the matter before a Medical Faculty and the Central Medical War Committee as a very urgent problem for reference to the appropriate Ministry.

If selective conscription of medical students registered before the war is not adopted I suggest that medical students who have commenced their fifth term should be exempted and should be required to undertake an appropriate type of national service.

Since submission of the above the new calling-up envisages exemption of all dental and medical students.—I am, etc.,

Leeds, Feb. 2. Z. P. FERNANDEZ.

INSULIN: ECONOMY IN PRESCRIBING AND VIALS

Those who regularly take insulin are asked by the Ministry of Health to help national economy by using double-strength (40 units per c.cm.) or the quadruple-strength (80 units per c.cm.) instead of the single-strength insulin (20 units per c.cm.), thereby effecting a considerable economy in glass bottles. They should consult their usual medical adviser and get his approval to an easy adjustment of the dosage so as to obtain the same therapeutic effect. It has been calculated that if all users of single-strength insulin used the double strength there would be a total saving of approximately 20,000 bottles a week. The Ministry states that there are ample stocks of insulin in the country; local shortages of particular brands are due to difficulties of distribution and in the supply of vials. Doctors are therefore asked not to specify a particular brand in their prescriptions. We publish in the *Journal* this week (p. 251) a letter from Dr. R. D. Lawrence on this subject.

British Medical Association

Branch and Division Meetings to be Held

METROPOLITAN COUNTIES BRANCH: KENSINGTON DIVISION.—At Derry and Toms, High Street, Kensington, Thursday, February 20, 2.30 p.m. Count Jan Balinski Lindahl (Director of the Polish Research Centre): Poland under the German and Soviet Occupation.

Meetings of Branches and Divisions

BATH, BRISTOL, AND SOMERSET BRANCH: WEST SOMERSET DIVISION

At a meeting of the West Somerset Division, held at Taunton on November 21, with Mr. J. R. NICHOLSON-LAILEY in the chair, Brigadier P. H. MITCHINER gave a British Medical Association Lecture on "The Immediate Treatment of Air-raid Casualties." He said that the proportion of dead to wounded was one to two. Of the wounded one-third were so seriously hurt as to be entirely beyond surgical aid; a large proportion of the remainder were so slightly injured as to require little surgery, although many had serious nervous disturbances. Head wounds were rare; abdominal wounds were not common, but when they occurred there was likely to be partial or complete evisceration. The commonest injuries were multiple small superficial wounds, generally on the posterior surface. Discussing first aid he emphasized that first-aid parties should not attempt dressings or splinting, but, after dealing with haemorrhage and covering the patients warmly, should convey the patients as quickly as possible to a first-aid

post. When patients reached hospital shock was very severe, and they should be treated before being taken to the theatre unless there was haemorrhage. If the pulse rate dropped transfusion was not necessary, but if the pulse rate did not fall then transfusion should be carried out, whole blood being preferable to serum or plasma. The blood should be given slowly, one pint and never more than two pints. Morphine should be given freely, 1/2 to 1 grain, as small doses were useless; children did better with tinct. opii. Scopolamine should be used with caution. If patients were cyanosed they should be given oxygen, but not merely because respirations were slow. For all large wounds there should be complete excision and exploration under gas-and-oxygen anaesthesia. Sutures should never be inserted if there was the slightest tension. Fractures should be excised, packed with vaseline gauze, and closed with plaster but kept under observation for three days. He was not in favour of local applications of sulphanilamide; they had no local effect and were wasted, as they merely acted by absorption. It was better to give 2 grammes of sulphanilamide by the mouth in hot lemonade or citric acid every four hours. Sulphanilamide should be used for burns at once. In the first-aid treatment no attempt should be made to clean the burn; tannic jelly or tea compresses should be applied, and the patient treated for shock. In hospital, patients suffering from burns should be given intravenous concentrated serum, or plasma, but not whole blood or saline. When the pulse rate fell gas and oxygen should be given, not ether, chloroform, or intravenous barbiturate. All dead skin, blebs, etc., should be removed and the skin disinfected for six inches round wound. Tannic acid or gentian violet should be applied. With burns on the face the eyes should be covered and the face dusted with powdered sulphanilamide or 1% gentian violet; the same treatment should be applied to perineal burns.

WAR EMERGENCY FORMULARY COMMITTEE

The members of the War Emergency Formulary Committee and the bodies they represent are as follows: Dr. H. Davis, voluntary hospitals; Dr. E. A. Gregg, British Medical Association; Prof. J. A. Gunn, Pharmacopoeia Commission; Dr. P. Hamill, Royal College of Physicians; Dr. C. H. Hampshire, Therapeutic Requirements Committee of the Medical Research Council; Mr. R. Dawson Hutchinson, Ministry of Health; Dr. Lewis Lilley, British Medical Association; Mr. H. N. Linstead, Pharmaceutical Society; Mr. A. R. Melhuish, National Pharmaceutical Union; Mr. A. Mortimer, Wholesale Drug Trade Association; Mr. F. B. Royal, London County Council; Dr. J. W. G. Steell, Ministry of Health. The secretary of the committee is Mr. H. L. F. Walton, who may be addressed c/o The Ministry of Health (Room 559), Caxton House West, Tothill Street, Westminster, London, S.W.1. One meeting has already been held.

Medical Services of H.M. Forces Appointments

ROYAL NAVY

Surgeon Lieut. J. L. S. Steele-Perkins to be Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Probationary Temporary Surgeon Lieut. H. C. A Johnston to be Temporary Surgeon Lieutenant

ROYAL AIR FORCE

Flying Officer on probation B. Fellows has been confirmed in his appointment.

ROYAL AIR FORCE VOLUNTEER RESERVE

To be Squadron Leaders for the duration of hostilities: R. Sampson, R. N Ironside, W. M. Morris, M P. Ellis, J. H. Hunt, K. A. Latter.

Flying Officers W M. Philip, R. R. Foote, G. J. Marks, A. A. Butler, G. Hutchison, C G Rob, J. S. Davies, W. M. R. Henderson, N. P. Shields, P A. Gimson, E B Nicol, and D. A. P. Stephen have been promoted to the war substantive rank of Flight Lieutenant.

To be Flying Officers for the duration of hostilities: T. N. Arthur, R. F. Braithwaite, G. A. Ewen, K. Froome, J. D. Gray, E. W. Miles, J. B. O'Meara, J. R. Sides, C. G. Woolgrove, J. M. Marchant, B. E. Betty, A. Morgenstein, K. M. Willis, J. Walker, A H. Nelson, T. M. Mansbridge, J. Grieve, J. B. Coltman, H. F. D. Whitelaw, H. Clifton, W. B. Thorburn.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Major D. W. John, M.C., has ceased to belong to the Reserve of Officers on account of ill-health.

Captain B Malaher to be Brevet Major, under the provisions of Article 168, Royal Warrant for Pay and Promotion, 1940.

SUPPLEMENTARY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Lieut. (War Substantive Captain) I. S Clal has ceased to belong to the Supplementary Reserve of Officers on account of ill-health.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

War Substantive Major T. L Hastings, M.C., has relinquished his commission on account of ill-health and retained his rank

Captain J. I. Watkins has relinquished his commission on account of ill-health.

Lieut. J. W. L. Follows, from Royal Signals, Territorial Army, to be Lieutenant.

LAND FORCES: EMERGENCY COMMISSIONS

ROYAL ARMY MEDICAL CORPS

War Substantive Captains A. W. L. Smith and H. Ward have relinquished their commissions on account of ill-health.

Lieut. T. J. Mullins to take rank and precedence in his Corps and in the Army as if his appointment as Lieut. bore the date November 18, 1940.

Lieut. F. M. J. McKerran has relinquished his commission on account of ill-health.

INDIAN MEDICAL SERVICE

Major-Generals W. H. Hamilton, C.B., C.I.E., C.B.E., D.S.O., and G. G. Jolly, C.I.E., have been granted the local rank of Lieutenant-General.

COLONIAL MEDICAL SERVICE

A. H. B. Pearce, L.R.C.P. & S.Ed., D.P.H., has been reappointed Deputy Director of Medical Services, British Guiana.

WEEKLY POSTGRADUATE DIARY

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.—*Mon.* to *Fri.*, Special course of lectures on War Surgery. *Daily*, 10 a.m. to 4 p.m., Medical Clinics, Surgical Clinics and Operations, Obstetrical and Gynaecological Clinics and Operations. *Daily*, 1.30 p.m., Post-mortem Demonstration. *Tues.*, 11 a.m., Paediatric Clinic, Dr. R. Lightwood. *Wed.*, 11.30 a.m., Clinico-pathological Conference (Medical). 3 p.m., Clinico-pathological Conference (Surgical). *Thurs.*, 2 p.m., Radiological Conference, Dr. Duncan White. *Fri.*, 2 p.m., Clinico-pathological Conference (Gynaecological).

EDINBURGH POSTGRADUATE LECTURES.—At Edinburgh Royal Infirmary. *Thurs.*, 4.30 p.m. Prof. J. A. Gunn: The Action of Drugs on the Human Uterus.

DIARY OF SOCIETIES AND LECTURES

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At Royal Society of Medicine, 1, Wimpole Street, W., *Mon.*, 3 p.m. Dr. A. J. E. Cave: The Comparative Anatomy and Evolution of the Paranasal Sinuses.

ROYAL SOCIETY OF MEDICINE

Section of Comparative Medicine.—Tues., 2.15 p.m. Discussion: Fluorosis in Man and Animals. Openers, Prof. T. J. Bosworth, Mr. F. Blakemore, Dr. H. H. Green, and Dr. M. Murray. Paper by Dr. Eugene Nassau: Culture of Tubercle Bacilli from Laryngeal Swabs

Section of Dermatology.—Thurs., 2.30 p.m. Presidential Address by Major W. J. O'Donovan: A Skin Convoy.

Section of Orthopaedics.—Sat., 11.30 a.m. Meeting at Chertsey. Discussion: Injuries to Peripheral Nerves. Opener, Mr. W. Rowley Bristow. Followed by Dr. J. St. C. Elkington.

VACANCIES

EXAMINING FACTORY SURGEON.—The appointment at Knowbury (Shropshire) is vacant. Applications to the Chief Inspector of Factories, Cleland House, Page Street, S.W.1, by February 18.

MEDICAL REFEREES UNDER THE WORKMEN'S COMPENSATION ACT, 1925, for the County Court Districts of Henley-on-Thames, Windsor (Circuit No. 39), Kingston-on-Thames, Wandsworth (Circuit (No. 45), Woolwich, Southwark (Circuit No. 47), Epsom, Guildford (Circuit No. 48), Croydon (Circuit No. 56). Applications to the Under-Secretary of State, Home Office (Industrial Division), Cleland House, Page Street, S.W.1, by March 3.

APPOINTMENTS

EXAMINING FACTORY SURGEONS.—D. K. Crawford, F.R.C.S., for the Berkhamsted District (Hertfordshire); W. F. Mangan, M.B., B.Ch., for the Liverpool (Garston) District (Lancashire); H. S. Cunningham Smith, M.R.C.S., L.R.C.P., for the Brixham District (Devonshire).

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

BIRTH

CRAWSHAW.—On January 25, at Omagh, Co. Tyrone, to Barbara, wife of Lieut. G. R. Crawshaw, R.A.M.C., a son.

DEATH

ALLAN.—On January 28, 1941, at "Ingledene," 39, The Avenue, Roundhay, Leeds, in his 88th year, James Allan, M.A., M.D.Aberd., D.P.H.Camb., late Medical Superintendent, St. James's Hospital, Leeds.

A resolution was passed by the executive committee of the Socialist Medical Association at its last meeting stating that it "considers that the imposition of a Purchase Tax on non-proprietary drugs and medicines is detrimental to the health and well-being of the nation. It calls upon the Government to abolish the Purchase Tax on the following items provided that no trade name or proprietary right is claimed in connexion with them: (*a*) all the preparations of the *British Pharmacopoeia* and the *British Pharmaceutical Codex*; (*b*) all other drugs and medicines if supplied on the prescription of a qualified practitioner."

BRITISH MEDICAL JOURNAL

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PREVENTION OF GAS-GANGRENE INFECTIONS IN EXPERIMENTAL WOUNDS BY LOCAL APPLICATION OF SULPHONAMIDE COMPOUNDS AND BY SERA

BY

FRANK HAWKING, D.M.

(From the National Institute for Medical Research, Hampstead)

This paper describes an experimental investigation into the possibility of using sulphonamide compounds to prevent the development of gas gangrene in wounds. Briefly, experimental wounds were made in guinea-pigs: one of the compounds was applied, a massive inoculation of *Cl. welchii*, *Cl. septique*, or *Cl. oedematiens* was introduced, and then the wound was closed, the efficiency of the treatment being indicated by the survival or death of the animal. This procedure involves two main problems: the activity of these compounds against anaerobes, and the value of treatment by local application instead of general systemic administration.

Literature

(*a*) *Activity of Sulphonamide Compounds against Anaerobes.*—The earliest reports on this subject appear to be those of Long and Bliss (1937) and Domagk (1937), who found that sulphanilamide and uleron would save mice from infection with *Cl. welchii*. Bohlman (1937) treated three cases of gas gangrene with sulphanilamide, and obtained a prompt response. More recently Stephenson and Ross (1940) have investigated the effect of these compounds in mice, the bacilli being injected intraperitoneally or intramuscularly and the drug being given orally. In the case of *Cl. welchii* they found that sulphanilamide and sulphapyridine would protect many of the animals. With *Cl. septique* sulphanilamide had little action, but sulphapyridine in large doses saved 50% of the animals. With *Cl. oedematiens* neither sulphanilamide nor sulphapyridine had any effect. In most cases treatment with serum was better than treatment with drugs, but the best results were obtained by a combination of the two. Henderson and Gorer (1940) obtained roughly similar results. McIntosh (at a recent conference) reported that, in mice, sulphathiazole was the most active compound, whether given generally or locally; but infections with *Cl. oedematiens* were difficult to influence. Burton, McLeod, McLeod, and Mayr-Harting (1940) found that the anaerobes are relatively insensitive to sulphanilamide and sulphapyridine *in vitro*, but highly sensitive to *p*-nitrobenzene-sulphonamide. Fuller (personal communication) finds that *in vitro* the anaerobes are most sensitive to sulphathiazole, less to sulphapyridine, and least to sulphanilamide.

(*b*) *Local Application of Sulphonamides to Wounds and Similar Lesions.*—The earlier literature on this subject contains a number of clinical papers, often with little evidence in support of their statements—e.g., Jaeger (1936), Tiling (1936), Brown (1937), Merz (1937), Bosse and Bosse (1939), Childrey (1939), and Smith (1940). Much more convincing is the paper by Jensen, Johnsrud, and Nelson (1939). They treated 41 cases of compound fracture with 5 to 15 grammes of sulphanilamide applied locally, combined with the usual surgical measures. The infection rate had previously been about 27%, but in their series only two cases (5%) became infected—due in both cases to having been re-compounded. The concentration in serum oozing from the wounds was 250 to 660 mg. per 100 c.cm. (the maximum solubility being about 800 mg.). They found also that the local application of sulphanilamide promoted the healing of staphylococcal infections of experimental fractures in guinea-pigs. Later papers have tended to confirm their findings. Thus Sézary (1939) reports that soft chancres and phagedaenic ulcers heal rapidly if they are dressed with powdered sulphanilamide, and Riou (1939) confirms this, using a paste containing 10% sulphapyridine. Mayo and Miller (1940) have recommended a saturated solution of sulphanilamide in saline for the irrigation of wounds following resection of the rectum; and Herrell and Brown (1940) have obtained encouraging results by applying a mixture of 3 grammes of sulphanilamide in 100 ml. saline to a variety of wounds, including infected thoracic and abdominal cavities. Wardle (1940), Jeffrey (1940), and Eisenhammer (1940) have found that the insertion of sulphanilamide into the knee-joint cavity causes no reaction. Chorine (1940) obtained very good results when 31 wounds were dressed with sulphanilamide. Levaditi, Bréchot, Gérard-Moissonier, and Tournay (1940) applied sulphanilamide or prontosil soluble to 12 older wounds infected with streptococci: marked clinical improvement was obtained in every case, and 5 of the wounds became free from these organisms. Colebrook (1940b) has similarly found that the local application of sulphanilamide will remove streptococcal infections from wounds. During recent months the application of sulphonamide compounds to wounds has been discussed by Colebrook (1940a), Jeffrey (1940), Buxton (1940), and others; unfortunately the disturbed conditions of war have so far prevented the collection of a satisfactory series of treated cases, complete with adequate controls.

On the experimental side the local application of sulphonamides seems to have attracted little attention at first apart from an unsuccessful attempt by Nicholson (1938) to treat streptococcal empyema in rabbits by intrapleural injections of prontosil soluble. With the outbreak of war, work was started in France. Nitti (1939) made experimental wounds in the dorso-lumbar muscles of rabbits. He applied a small compress of gauze soaked in a culture of streptococci, and on top of this about 1 gramme of sulphanilamide, the skin being finally closed. The controls died in twenty-four to forty-eight hours. Treated animals were still alive forty-eight hours later; the wound was reopened, the gauze removed, and new sulphanilamide added; under these circumstances most of the treated rabbits survived. The local application of sulphanilamide to a wound never caused irritation, its toxicity was low, and it was all absorbed and eliminated in forty-eight to sixty hours. Legroux (1940) used a technique closely resembling that of the present paper (to which it served as a pattern). His main experiments were similar to those of Nitti. He also made studies in guinea-pigs, the wound being dusted with sulphanilamide and infected by the insertion of a piece of cloth soaked in a culture of *Cl. welchii* or *Cl. histolyticum*. Controls died in two to three days. Animals which had received sulphanilamide died after four to seven days; but if the wound was reopened, the cloth removed, and new sulphanilamide added they survived. Delay of the treatment for more than one hour after insertion of the culture or administration of the compound by mouth instead of by local application resulted in death of the guinea-pigs. In similar experiments with *Cl. tetani* sulphanilamide produced only a slight prolongation of life.

Experimental

The experimental technique used in the present work was based on that of Legroux (1940). Under full anaesthesia with chloroform, an incision was made on the inside of the thigh of a guinea-pig (weight 200 to 250 grammes). The muscles anterior and posterior to the femur were well crushed with Spencer Wells forceps, the main blood vessels being spared. The drug (0.2 gramme) was then spread over and into the crushed muscle. A piece of cloth 15 by 15 mm. soaked in the bacterial culture was placed on top of the muscle and the wound was tightly closed by continuous suture. After three days, in animals which survived, the wound was reopened under an anaesthetic, the cloth was removed, and fresh drug (0.2 gramme) was applied, the skin being resutured loosely. The culture used was a twenty-hour growth in meat broth containing glucose. The cloth took up about 0.1 gramme of the fluid. Numerous control experiments showed that even four times this volume of fluid, sterilized by filtration, did not contain enough toxin to kill a guinea-pig. The density of the culture was estimated roughly by comparing its capacity with that of standard Brown's tubes. In order to avoid error due to abnormal strains of organisms numerous different strains were examined. The origin of these is as follows.

Cl. welchii :

A.5 : isolated May, 1940, from compound fracture ; no gangrene
S.R 12 : " 1915, " fatal gas gangrene
Corcoran : " 1939, " peritonitis
A 7 : " " 1940, " non-fatal gas gangrene
S.107 : animal origin, used as toxin-producer at Marburg for many years (Henderson, personal communication).
Rosher : isolated, 1940, from puerperal gas gangrene
Hudson : " June, 1940, from wound without gas gangrene
Barnetson : " " " " wound of chest ; empyema
Constantine : " " " " non-fatal gas gangrene

Cl. septique :

V.S.14 : Pasteur III, from Nat. Coll. type cultures—Type I
V.S.20 : isolated 1914–18—Type III
V.S.A.48 : " June, 1940, from non-fatal case of tetanus
V.S.A.52 : " " " " " osteomyelitis and ? gas gangrene

Cl. oedematiens :

No. 3 : from Nat. Coll. type cultures (140, No. 3908). More than 11 years old
Cossard : ditto, isolated, 1918, from fatal gas gangrene

In most of the experiments the control untreated animals died in twenty-four hours, and showed the typical appearances of purplish subcutaneous oedema spreading out from the wounded thigh and involving much of the abdomen and thorax. Bacilli were present in the oedema fluid, in the peritoneum, and often in the heart blood taken shortly before death. Treated animals which died in the first two days showed post-mortem appearances similar to the controls. In a few cases in which the invasiveness of the organisms and the restraining influences (defence mechanisms plus drug) were approximately balanced a spread of gangrenous oedema took place over part of the abdomen, the skin being sodden, foul, and depilated ; some of the affected animals died in four to seven days ; others gradually recovered, the oedematous skin becoming hard, dry, and wrinkled. Some treated animals which survived the initial infection developed a large ulcer in the injured groin, with secondary infections of all kinds ; these ulcers often penetrated into the abdomen, eventually causing death between the seventh and sixteenth days. The appraisal of such deaths is difficult, but fortunately they were few in number. All animals were observed for thirty days ; but for the purpose of statistics we have taken an arbitrary period of ten days (which includes almost all the deaths), and only those occurring within that period have been shown in the protocols. In order to give a concise quantitative indication of the prolongation of life occurring among the non-survivors, an index figure (the guinea-pig-day index) has been calculated by adding up the number of guinea-pigs in the group which were alive on each of the first ten days after the initial operation and expressing this figure as the percentage of the maximum number of guinea-pig-days possible under this system—i.e., 60 in a group of 6 guinea-pigs. With *Cl. oedematiens*, however, it happened several times that the initial wound healed perfectly and the animal appeared quite well until about the fifteenth day, when it died with the post-mortem appearances typical of this infection (i.e., massive gelatinous oedema of the subcutaneous tissues). Hence, with *oedematiens* the survival figures and the "guinea-pig-day index" are based on a period of twenty days.

The reopening of the wounds on the third day afforded an opportunity for inspection. In treated animals which would survive completely the wounds usually contained a trace of thin fluid ; pus was slight or absent. Parts of the damaged muscles were white and necrotic, but often the sloughs were surprisingly small in extent ; the rest of the muscles was vascular and bled easily. By this time sulphanilamide had all been absorbed, but sulphapyridine and sulphathiazole were found, in the appropriate animals, as small flattened masses. The action of the compounds is essentially bacteriostatic, not bactericidal. Smears made from the wounds on the third day invariably demonstrated great numbers of clostridia, which could readily be cultivated on appropriate media.

Preliminary experiments, made by inserting sulphanilamide, sulphapyridine, and sulphathiazole in solid form subcutaneously or intraperitoneally, showed that these compounds are comparatively harmless to the body tissues. By the naked eye no signs of local inflammation are seen ; microscopically a diffuse infiltration by polymorphs and monocytes is found, but this is not much more than would occur with any foreign body. Sodium sulphapyridine, however, is very irritant, being strongly alkaline. Similar conclusions concerning the innocuousness of sulphanilamide have been reached by Russell and Falconer (1940b), by Key and Burford (1940), and by Glynn (unpublished).

Prophylactic Action of Sulphonamide Compounds

In these experiments sulphanilamide, sulphapyridine, and sulphathiazole were used, and also a mixture (designated the "mixture" for brevity) of sulphanilamide 2 parts and sulphathiazole 1 part. It was hoped that this would combine the merits of the two components, sulphathiazole being the most potent and sulphanilamide being much cheaper and also more soluble and diffusible, which might be advantageous in the earliest stages of wound treatment. The power of the different compounds to prevent infection under these conditions is shown in Table I, in which the results of different experiments are grouped together. In addition to a variation from one experiment to another, depending presumably on the virulence of the strain used, the number of bacilli introduced, the amount of toxin present, etc., the findings vary with the different organisms employed, so that it is necessary to consider each organism separately.

TABLE I.—*Protection of Guinea-pigs against Gas-gangrene Infections by Local Application of Sulphonamide Compounds.* (The figures in brackets in each column represent the "guinea-pig-day" index.")

Strain	Survival of Animals				
	Sulphanilamide	Sulphapyridine	Sulphathiazole	Mixture	Controls
(*a*) *Cl. welchii :* Corcoran & Rosher	9/12 (86)	7/12 (80)	11/12 (93)	5/6 (88)	0/12 (3)
S.107 and A.7 ..	—	2/12 (21)	9/12 (77)	—	0/12 (1)
S.107 and S.R.12..	—	—	3/6 (50)	—	0/6 (0)
S.R.12	—	3/6 (67)	—	—	0/6 (0)
S.R.12	4/6 (73)	4/6 (82)	—	—	0/6 (3)
Hudson and Barnetson, plus contaminants* ..	3/12 (33)	1/12 (19)	5/12 (70)	*8/12 (79)	0/12 (0)
Totals	16/30 (62) (53%)	17/48 (48) (35%)	28/42 (73) (67%)	13/18 (81) (72%)	0/54 (1) (0%)
(*b*) *Cl. septique* V.S.20, V.S.A.48, and V.S.A.52 ..	0/23 (7) (0%)	9/24 (41) (38%)	18/24 (84) (75%)	7/17 (47) (41%)	0/24 (0.5) (0%)
(*c*) *Cl. oedematiens* No. 3 and Cossard	5/18 (41) (28%)	1/18 (10) (6%)	6/18 (38) (33%)	1/6 (21) (17%)	2/18 (14) (11%)

* In these two experiments the cultures of *Cl. welchii* were mixed with cultures of *B. proteus*, *B. coli*, *Ps. pyocyanea*, and *Cl. sporogenes* to imitate the conditions of a grossly contaminated wound.

(*a*) *Cl. welchii.*—The culture usually contained over 10⁹ bacilli per ml., and dilutions of 1 : 10,000 killed control animals when introduced into the wounds. Nevertheless the compounds usually saved a large proportion of the treated animals; and the life of non-survivors was often prolonged, as is shown by the "guinea-pig-day index." Since some of the experiments did not include all the three compounds, a simple inspection of the total survivals in each column does not provide an accurate picture of their relative potency; it is necessary to consider only those experiments in which each of the pair under comparison was present. Then, taking the three different pairs, consideration of the mixture being postponed, the following ratios of potency are obtained:

	Survivals	Average Guinea-pig-day Index
Sulphanilamide : sulphapyridine .	16 30 . 12 30	60 56
Sulphapyridine : sulphathiazole .	10 36 : 25 36	40 80
Sulphanilamide : sulphathiazole .	12 24 : 16 24	60 80

Accordingly, sulphathiazole is distinctly more active against *Cl. welchii* than sulphapyridine, while sulphanilamide occupies an intermediate position. Another basis for comparison may be obtained by taking the totals of three experiments in which all four substances were tested and the infections in the wounds were especially virulent (not shown separately in table): the survivals were: controls 0 18, sulphapyridine 5 18, sulphanilamide 8 18, sulphathiazole 10 18, and "mixture" 13/18. The order of activity was the same as before, apparently the "mixture" was equal or superior to sulphathiazole, but with this number of animals only a tentative conclusion is possible.

(*b*) *Cl. septique.*—With this organism the cultures usually contained about 10⁹ bacilli per ml. Sulphathiazole was again the most potent compound (survivals 75%): sulphapyridine was inferior (38%): sulphanilamide had practically no action against this organism (0%): while the "mixture" had an effect similar to that of sulphapyridine (41%).

(*c*) *Cl. oedematiens.*—The culture usually contained over 10⁹ bacilli per ml.; dilutions of this amount by 1,100 often failed to kill control animals when introduced into the wounds. The survivals after sulphanilamide and sulphathiazole were somewhat more numerous than those among the controls, but not significantly so: and life was often prolonged, the differences between the "guinea-pig-day indices" being just great enough to be statistically significant (probability, 1 : 20). Probably sulphathiazole possesses a small prophylactic activity against infection with *Cl. oedematiens*, but it is much less than that against *Cl. welchii* and *Cl. septique*.

Controls.—In order to be sure that the survival of the treated animals was due to the specific action of the sulphonamide compounds and not to a non-specific action possessed by other powders a series of comparisons was made with various neutral compounds—namely, sodium chloride, calcium carbonate, and urea. As was expected, calcium carbonate or urea had no power at all to prevent infection, while sodium chloride appeared positively to favour its development.

Comparison with Other Anti-bacterial Compounds

Brief tests were also made on a number of other anti-bacterial compounds. So far as this short investigation went soluseptasine and prontosil soluble were inferior to sulphathiazole, possessing little or no activity. The survivals after proseptasine and prontosil rubrum were not much different in number from those after sulphathiazole; but the clinical condition of the wounds (many of which showed a limited spread of the gangrenous infection) was definitely worse. None of these four compounds seemed promising enough to warrant more extended investigation. A number of animals were treated with nitrobenzene-sulphonamide; the results indicated that this compound is highly toxic, and that *in vivo*, under these experimental conditions, its activity is no greater than that of sulphathiazole. Experiments were also made with proflavine on account of the recommendations which this compound has received as a non-irritant antiseptic for wounds in recent papers—e.g., Russell and Falconer (1940a). Applied in strong concentration proflavine will certainly prevent infection of a wound by anaerobes subsequently inserted. On reopening at the third day, wounds which had been treated with 1% or 0.1% solutions showed fairly healthy tissues and only small numbers of bacilli. Nevertheless, in view of the mediocre results obtained with acridine compounds in the last war (presumably through inability to reach bacteria situated inside the tissues), the usefulness of proflavine as a wound antiseptic is probably limited.

Comparison of Local and Systemic Treatment

Guinea-pigs treated locally were compared with those which received sulphathiazole intraperitoneally, given as a suspension in water, about two hours before the wound was made. The dose was 0.2 gramme per guinea-pig of 200 to 250 grammes. This was about the maximum tolerated dose for infected animals: healthy animals would stand 0.4 or sometimes 0.8 gramme intraperitoneally, but infected ones were apt to show toxic symptoms after 0.4 gramme. In any case much of the drug was not absorbed during the first two days, but was deposited as small masses throughout the abdomen. (When sulphonamides are inserted into a wound, however, the toxicity depends more upon the rate of absorption than upon the total quantity injected: under these circumstances guinea-pigs will tolerate over 1 gramme of sulphathiazole.) The results of this series are given in Table II. The difference

TABLE II.—*Comparison of Activity of Sulphathiazole in Protecting Guinea-pigs against Gas-gangrene Infections when Applied Locally and when Administered Systemically by Intraperitoneal Injection.* (The figures in brackets in each column represent the "guinea-pig-day index.")

Infection	Survival of Animals		
	Local Treatment	Intra-peritoneal Treatment	Controls
Cl. welchii (4 strains) ..	14 24 (74)	5 14 (46)	0 24 (0)
Cl. septique (2 strains) ..	7 12 (67)	0 3 (3)	0 12 (0)
Totals	21 36 (71) (55%)	5 22 (30) (23%)	0 36 (0) (0%)

in efficacy between the two treatments is greater with *Cl. septique* than with *Cl. welchii*; but, taking the two together, it is seen that while local treatment saved 58% of the animals, systemic (intraperitoneal) treatment, even if given two hours previously, saved only 23%. Thus, although systemic treatment has some value it is inferior to local treatment under these experimental conditions.

Effect of Delaying Local Treatment

The effect of delaying local treatment was studied in four experiments with *Cl. welchii* and one with *Cl. septique*. In these animals the wound was made in the usual manner and the cloth soaked in culture inserted. After two hours or six hours the incision was reopened, the cloth lifted out, the wound packed with 0.2 gramme of sulphathiazole, and the cloth replaced. Taking the series as a whole it was found that when treatment was immediate 20 out of 30 animals survived (67%): when the treatment was delayed two hours 3 out of 15 animals survived (26%): and when treatment was delayed six hours none out of 6 animals survived. None of the 30 controls survived. Thus a delay of even two hours greatly reduced the efficacy of the treatment.

Diffusion of Sulphonamide Compounds from Wounds

The time required for absorption of the compounds from wounds and the concentrations which occurred in adjacent tissues were studied in two ways. First, pre-

liminary experiments were made to see how far the high concentration present in the wound cavity extended through the adjacent tissues. A transverse incision was made into the lumbar muscles of rabbits (weight about 1 kg.), and 0.25 gramme of sulphanilamide, made into a thick paste with water, was inserted. The fascial covering of the muscle was carefully sutured together and any extruded sulphanilamide wiped away. The skin wound was then closed. Six or twenty-four hours later the rabbits were killed, and transverse slices of the lumbar muscles about 0.5 cm. thick were taken at various distances from the wound; blood from the heart and pieces of muscle from the opposite thigh were also taken as controls. The concentration of free sulphanilamide in the various specimens was estimated by the method of Marshall and Litchfield (1938). The results of an experiment comprising six rabbits are given in Table III. At six hours

TABLE III.—*Diffusion of Sulphanilamide from an Uninfected Wound in Rabbit's Muscle*

Time	Concentration of Free Sulphanilamide (mg. per 100 c.cm.)				
	Sides of Wound	1-2 cm. Away	4-5 cm. Away	Control Muscle (Opp. Thigh)	Blood
6 hours ..	105+	16.2	2.6	2.2	0.7
	122+	4.9	5.0	3.8	1.3
	109+	7.0	3.2	5.1	1.8
Average ..	112+	9.4	3.6	3.7	1.3
24 hours ..	0.12	0.2	0.13	0.1	0
	0.3	0.1	0.13	0.13	0
	0.3	0.13	0.6	0.1	0
Average ..	0.24	0.14	0.29	0.11	0

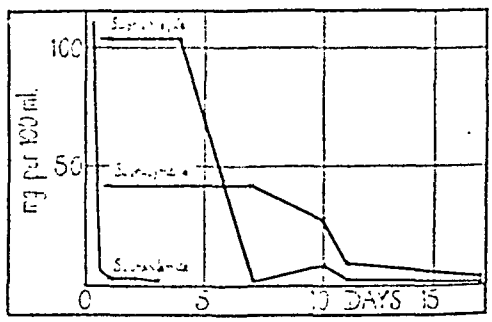
solid sulphanilamide was still present in the wound, but after twenty-four hours practically all the sulphanilamide had disappeared. At six hours the concentration in muscle 4 to 5 cm. away from the wound was no greater than that in muscle elsewhere; muscle 1 to 2 cm. away from the wound appeared to have a higher concentration, but part of this may have been due to leakage from the wound between the surface of the muscle and its fascial covering. At any rate, the higher concentration did not extend to any great distance from the wound. The fact that the concentration of free sulphanilamide in the control muscles of these animals was higher than that in the blood was unexpected, but similar findings were obtained in confirmatory experiments.

The second series of experiments was made to investigate the fate of sulphonamide compounds in the experimental wounds of guinea-pigs described above. The wounds were formed in the standard manner, and 0.2 gramme of the various compounds was inserted; they were then closed without inserting the piece of cloth. The animals were killed at suitable intervals, the reopening of the wound on the third day being omitted. The muscles of the wounded thigh, the muscles of the opposite thigh (control), and blood from the heart were taken for chemical estimation. The results of these experiments are given in Table IV, and the average concentration of the various compounds in the wound is depicted graphically in the figure. Sulphanilamide is rapidly absorbed, so that its influence in the wound is probably slight after the first twenty-four hours. Solid sulphapyridine persists in the wound for seven to ten days; its solubility in 0.85% saline at 37° C. is 42 mg. per 100 ml. Solid sulphathiazole persists in the wound over four days; during this period its concentration in the wound fluids will be higher than that of sulphapyridine, owing to its greater solubility—namely, 104 mg. per 100 ml. in 0.85% saline at 37° C. (Ewins, personal communication). This greater solubility may be a partial explanation of its greater therapeutic potency (described above), but part also is due to its more powerful bacteriostatic action against anaerobes, which can be demonstrated *in vitro* (Fuller, personal communication). By a suitable mixture of the more diffusible sulphonamides—e.g., sulphanilamide and sulphathiazole—

TABLE IV.—*Concentration of Sulphonamide Compounds in Guinea-pigs (Weight 200 to 250 grammes), following Insertion of 0.2 gramme of Drug into Experimental Wounds*

Day	Concentration (mg. per 100 ml.)								
	Sulphanilamide			Sulphapyridine			Sulphathiazole		
	Wound	Control Muscle	Blood	Wound	Control Muscle	Blood	Wound	Control Muscle	Blood
1	3.0	0.17	0.21	S (42)	2.1	2.4	S (104)	2.4	1.2
2	3.0	0.21	0.07	S (42)	1.5	1.5	S (104)	0.35	0.6
3	1.8	0.33	0	S (42)	0.8	0.3	S (104)	1.1	0.5
4	—	—	—	S (42)	3.2	1.3	S (104)	0.7	0.7
7	—	—	—	S (42)	0.5	0.5	1.2	0.03	0.03
10	—	—	—	27.6	0.2	—	8.3	0.5	—
11	3.7	0.2	—	9.9	0.3	—	2.1	0.06	—
18	1.2	0.04	—	3.1	0.02	—	1.7	0.1	—
28	—	—	—	0.4	0.3	—	0.5	0.3	—

The figures given are the average for groups of three animals. S indicates that solid compound was present.



Graph showing concentrations of sulphonamides in wounds of guinea-pigs.

with the less diffusible ones—e.g., sulphapyridine and proseptasine—it would be possible to produce a combination which would embody the advantages of both types—namely, the high initial concentration of the former and the prolonged action of the latter. However, so far as infection of wounds with *Cl. welchii* or *Cl. septique* is concerned, it is probably the initial period which is the important one: if the organisms can be held in check for the first two to four days it is less likely that gas gangrene will develop.

Comparison of Drug Treatment with Treatment by Antisera

A number of the animals were also treated by antisera. The wound was made according to the standard technique, the antiserum being given by intraperitoneal injection shortly before or after the operation; on the third day the wound was reopened to remove the cloth, and the dose of antiserum was repeated. It is impossible to reproduce human conditions exactly, since among other difficulties there is no agreement as to what is an equivalent dosage of a serum for a guinea-pig and for a man. Two series of experiments were made. In the first (Table V) use was made of three concentrated monovalent sera kindly supplied by Burroughs Wellcome and Co.: (1) prepared against *Cl. welchii*, S.R.12 (Type A)—4,000 units of antitoxin per ml.; (2) prepared against *Cl. septique*, V.S.14—6,000 units of antitoxin per ml.; (3) prepared against *Cl. oedematiens*, No. 3—9,000 units of antitoxin per ml. The doses given are probably much larger than is necessary. With *Cl. welchii* the antiserum gave complete protection in one case and no protection in the other; it is not clear whether this was due to the different strain used or to the delay in administering treatment. With *Cl. oedematiens* all the animals treated by serum survived except for 2 which died seventeen days after the second dose:

TABLE V.—*Comparison of Activity of Sulphathiazole in Protecting Guinea-pigs against Gas-gangrene Infections with that of Specific Monovalent Sera (Antitoxin)*

Infection		Antitoxin		Survival of Animals		
Strain	Bacilli per ml. × 10⁸	Dose Units	Time	Antitoxin	Sulphathiazole	Controls
Cl. welchii, S.107, incompletely washed	23	1,000 i.p.	½ hr. before	3/3 (100)	5/6 (83)	0/6 (0)
Cl. welchii, A.7, incompletely washed	·	1,000 i.p.	2½ hrs. after	0/3 (0)	4/6 (67)	0/6 (0)
Cl. septique, V.S.14, washed	<0.5	500 i.v. 1,500 locally	Just before Just before	3/3 (100) 3/3 (100)	3/3 (100) (sulphapyridine)	1/3 (40)
Cl. oedematiens, No. 3, washed	<0.5	9,000 i.p.	1½ hrs. before	5/6 (99)	2/6 (43)	1/6 (20)
Cl. oedematiens, No. 3, incompletely washed	1.8	1,000 i.p.	½ hr. after	2/3 (99)	4/6 (67)	1/6 (18)

presumably, if treatment had been continued at five-day intervals these deaths would not have occurred.

The second series of experiments was designed to imitate more closely the conditions in a casualty department when a small dose of antitoxin is given prophylactically against an infection of unknown identity. A commercial polyvalent serum was taken containing *Cl. welchii* antitoxin 3,000 units, *Cl. septique* antitoxin 1,500 units, and *Cl oedematiens* antitoxin 1,000 units per ml. This was injected intraperitoneally at the time of the operation or at various subsequent periods. Many different strains of clostridium were used to infect the wound; in some experiments two different strains were inserted simultaneously (Table VI). The most striking features are the

TABLE VI.—*The Activity of a Polyvalent Serum (Antitoxin) in Protecting Guinea-pigs against Gas-gangrene Infections*

Infection		Dose of Serum (ml.)	Survival of Animals					
			Antitoxin					
Strain	Bacilli per ml. × 10⁸		Before	After 1 hr.	After 2 hrs.	After 6 hrs.	Sulphathiazole	Controls
Cl. welchii								
A.5 ..	>10	0.3	0/2 (0)					0/2 (0)
S.R.12 ..	3	0.3	2/2 (100)		3/3 (100)	3/3 (100)	3/3 (100)	0/3 (0)
S.107 ..	>10	0.3	1/3 (50)				0/3 (0)	0/3 (0)
Rosher ..	8	0.3	2/2 (100)					0/2
Hudson & Barnetson ..	>10	0.3	3/3 (100)		0/3 (23)	0/3 (0)		0/3 (0)
Constantine ..	7	0.3	2/2 (100)					0/2 (0)
Cl. septique								
V.S.14 and V.S.20	3	0.3	0/2 (0)					0/2 (0)
V.S.A.48 .	1	0.6	0/2 (0)	0/2 (0)	0/2 (0)		6/6 (100)	0/6 (0)
V.S.A.48 and V.S.A.52	1.5	0.3			0/3 (0)			0/3 (0)
Cl. oedematiens								
No. 3 ..	2	0.2	1/2 (67)					0/2 (5)
Cossard ..	5	0.3	0/2 (50)					0/2 (5)

comparative success of this antiserum in protecting the animals against *Cl. oedematiens* (against which drugs are ineffective) and its failure against *Cl. septique* (for which sulphathiazole is potent). Against *Cl. welchii* the results varied according to the different strains. Delay in the treatment in one case (Hudson and Barnetson) annulled its efficacy. Since the serum was administered intraperitoneally in all these animals there may have been some delay before a sufficient amount was absorbed into the blood stream and carried to the wound. A more detailed discussion of these results with serum is beyond the scope of this paper.

Discussion

The information obtained experimentally about the prevention of gas gangrene in wounds by the local application of sulphonamide compounds may be briefly summarized thus: Sulphonamides will protect against *Cl. welchii* and *Cl. septique*, but only to a slight extent against *Cl. oedematiens*; the most potent compound under these experimental conditions is sulphathiazole; treatment by local application is more effective than systemic treatment; delay in applying the treatment reduces its value considerably. These results concerning the superior potency of sulphathiazole and the difficulty of combating infections with *Cl. oedematiens* agree with the experience obtained in mice by McIntosh (above) and by Stephenson (personal communication). The findings are more favourable than those originally reported by Legroux, although his infections appear to have been less severe, since his controls lived for two to three days while those in the present work died in twenty-four hours.

The fundamental purpose of all this research was to obtain information as to how far the insertion of sulphonamide compounds into wounds would be a useful addition to the surgical methods now employed. Such insertion could occur under three different conditions: (1) On the battlefield, with little disturbance of the wound, for the purpose of delaying the development of infection in cases which will not reach a surgeon for a long period or in which surgical treatment must be postponed on account of shock (Buxton, 1940). (2) In the operating theatre, after débridement, etc. (possibly followed by plaster-of-Paris), for the purpose of inhibiting the development of organisms (anaerobic or pyogenic) which cannot be excised. (3) At subsequent dressings of wounds (this will probably be directed mainly against streptococci).

The experiments were designed to resemble the first two of these groups: but admittedly the conditions are somewhat artificial, and a simple transference of the conclusions to human cases is not quite legitimate. However, they do suggest strongly that treatment along these lines would be beneficial to casualties. Such treatment can be recommended the more confidently since the compounds are innocuous and non-irritant. A number of air-raid casualties and street accidents have been treated in this way at adjacent hospitals, and the results have been extremely satisfactory, even in wounds with a heavy initial contamination.

So far as gas gangrene is concerned, the treatment may be expected to be of value chiefly as a prophylactic measure, and much less so as a therapeutic one: and clearly it should be a supplement to proper surgical measures and not a substitute for them (unless they are not available). In dealing, however, with a condition such as gas gangrene, which although often fatal has a low and irregular incidence, it will be very difficult to get reliable evidence about the value of such prophylactic treatment in human cases. At a recent conference the incidence of gas gangrene among air-raid casualties was given as 5 in 1,000 (0.5%) in one town and 5 in 187 (2.7%) in a hospital in another. Assuming an incidence of 1.5%, and that a prophylactic treatment applied to all patients caused a diminution by 80%—that is, an incidence rate of 0.3%—then to get the barest significant result (probability of chance, 1:22), and using the strictest precautions to obtain identical patients in both series, two sets of cases each about 320 in number would be required. Under actual clinical conditions, even if great care were exercised, a much larger number would be needed. Consequently an assessment of the value of this treatment by purely clinical methods will take a long time, even with the abundance of material which war unfortunately provides.

Finally, a word on the prophylaxis of gas gangrene by means of serum—although this question lies mainly outside the scope of the present paper. Since serum and

drug supplement one another, the ideal procedure for *general* use should include both. In special hospitals, however, where *large* numbers of casualties are seen, it would be desirable to build up three series of cases—treated respectively with drug, with serum, and with neither (controls)—so that the clinical assessment on these procedures (discussed above) could eventually be made.

Summary

Experimental wounds (with crushed muscle and the presence of a foreign body) were made in guinea-pigs, and large numbers of gas-gangrene organisms were inserted; untreated animals died within twenty-four hours.

Application of sulphonamide compounds to the wounds at the same time as insertion of the organisms saved a large proportion of the animals infected with *Cl. welchii* and with *Cl. septique*, but it had only slight influence upon infections with *Cl. oedematiens*. Sulphathiazole was the most effective compound to use in all cases; sulphanilamide was superior to sulphapyridine in preventing infection with *Cl. welchii*, but it had practically no activity against *Cl. septique*.

Local application of sulphathiazole to the wound was more effective in preventing infection than systemic administration by intraperitoneal injection. Delay of two hours in applying the treatment greatly reduced its effectiveness.

Sulphanilamide is absorbed from wounds very quickly (in less than twenty-four hours), giving a high but transitory concentration in the fluids of the wound (1,500 mg. per 100 c.cm.); sulphapyridine is absorbed slowly from the wound (seven to ten days) and its concentration in the wound is low (42 mg.) but prolonged; sulphathiazole occupies an intermediate position, being absorbed in about five to six days and producing a concentration of about 104 mg.

The development of the infection in these wounds could also be prevented by administration of sera (antitoxin). Monovalent sera specific for *Cl. welchii*, *Cl. septique*, or *Cl. oedematiens* protected the guinea-pigs against these organisms respectively. A commercial polyvalent serum gave protection against *Cl. welchii* (most strains) and *Cl. oedematiens*, but not against *Cl. septique*.

It is recommended that war wounds should be protected against the development of gas gangrene by the local application of sulphonamide compounds together with injection of antitoxin.

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ACTIVATION OF THROMBOPLASTIN PREPARATIONS BY HAEMOLYSIS AND BY LECITHIN

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During an investigation into the effect of storage on the prothrombin index of blood (Crosbie, Scarborough, and Thompson, 1941) one of us (A. C.) observed that the presence of haemolysis in the plasma was often associated with a decreased coagulation time as determined by Quick's technique. This acceleration was more pronounced when Russell-viper venom was used instead of brain extract as the source of thromboplastin as recommended by Fullerton (1940). While seeking an explanation for this phenomenon we read the letter of Hobson and Witts (1940) stating that they had confirmed the original observation of Trevan and Macfarlane (1936–7) that the coagulant action of Russell-viper venom was potentiated by the addition of lecithin. It occurred to us that the accelerating effect of haemolysis might be due to the liberation of lecithin into the plasma from the ruptured envelopes of erythrocytes. In this paper, a summary of which has already appeared (Crosbie and Scarborough, 1941), we give an account of our results. While the paper was being prepared for the press Witts and Hobson (1940) published their own observations, which demonstrated that lecithin used in association with Russell-viper venom produces an acceleration of the coagulation time as determined by Quick's method, and suggest that the adjuvant action of lecithin may be used in the elucidation of three types of haemorrhagic tendency.

Material and Methods

None of the subjects from whom blood was taken for this investigation had any form of haemorrhagic disease. Apart from a few patients with jaundice, to whom specific reference is made, the subjects either attended the out-patient department for minor complaints or were normal healthy adults. All coagulation times were determined by the method of Quick (1936), except that snake venom or venom plus lecithin replaced brain extract as the source of thromboplastin.

4.5 c.cm. of venous blood withdrawn with the minimum of trauma was added to 0.5 c.cm. of M/10 potassium oxalate or, in some cases, to 0.5 c.cm. of 3.8% sodium citrate. In order to reduce cell damage to the minimum, centrifugalization was avoided and plasma was obtained by allowing the specimens to stand overnight in a refrigerator at 2° to 5° C. This treatment does not affect the coagulation time as determined by Quick's original method with brain extract as the source of thromboplastin. 0.1 c.cm. of plasma was pipetted into a clean dry test-tube (7 × 70 mm.) in a water bath at 37° C. and mixed with 0.1 c.cm. of thromboplastin preparation. Immediately 0.1 c.cm. of M/40 calcium chloride was added and the coagulation time at 37° C. was determined in seconds.

Three sources of thromboplastin were used:

1. Brain Extract.—This was prepared according to the method of Quick, but from human instead of from rabbit brain as originally recommended.

2. Russell-viper Venom (stypven, B. W. and Co.).—Two different batches of material were used. They did not differ appreciably in activity. A dilution of 1 in 10,000

(0.1 mg. in 1 c.cm.) proved satisfactory: higher dilutions were found to give increased coagulation times.

3. Russell-viper Venom plus Lecithin.—The preparation of lecithin used was a 10% alcoholic solution of ovolecithin (*B.P.C.*). This substance is by no means pure. It is prepared from dried egg-yolk by extraction with alcohol and precipitation by acetone. According to the 1934 *Codex*, "when so prepared the product consists of a mixture of true lecithin and a similar compound, kephalin." A large number of different lecithins occur naturally, and lecithins are present in the membrane of human erythrocytes to the extent of 3.25 to 5.75 mg. per c.cm. of cells (Ponder, 1934). The particular preparation of ovolecithin used by us was equally active over a wide range of dilutions, and we accordingly adopted the dilution previously suggested by Hobson and Witts (1940).

Haemolysis was produced mechanically — "slight" haemolysis by gentle shaking for one minute, and "marked" haemolysis by vigorous shaking for two minutes. Haemolysed plasma was then obtained by centrifuging.

Results

The following points emerge from a consideration of Table I, which illustrates the effect of haemolysis on the coagulation time of both oxalated and citrated plasma with either brain extract or 1 in 10,000 Russell-viper venom as the source of thromboplastin:

1. The coagulation time is reduced by haemolysis, the reduction being greater with "marked" than with "slight" haemolysis.

2. The acceleration of the coagulation time is more pronounced when venom instead of brain extract is the source of thromboplastin. It is indeed possible that the differences obtained with brain extract are without significance.

3. In the absence of haemolysis the observations show a fairly wide scatter. This scatter is reduced by "slight" haemolysis. After "marked" haemolysis there is extraordinary *uniformity throughout the series, especially when venom is the* source of thromboplastin. Associated with this regularity of the final result there is wide variation in the extent to which the coagulation time is reduced by haemolysis.

4. Viper venom, in the absence of haemolysis and without lecithin, is a more potent source of thromboplastin than is brain extract. It should be pointed out, however, that Quick regularly obtains coagulation times of 11 to 15 seconds using brain extract.

With a view to determining whether the acceleration of *the coagulation time found in association with haemolysis* was due to the liberation of haemoglobin into the plasma or to some other substance freed at the same time, the following series of experiments was designed.

A solution of "crystalline ox haemoglobin" was prepared containing 250 mg. in 2 c.cm. 0.9% sodium chloride (12.5 grammes haemoglobin per 100 c.cm.). This was added to plasma free from haemolysis in the proportion of 0.1 c.cm. of haemoglobin solution to 1 c.cm. plasma. We have unfortunately been unable to trace the source of the preparation of haemoglobin used. It was contaminated with methaemoglobin. To an equal amount of the same plasma was added 0.1 c.cm. of freshly withdrawn human blood (14 grammes of haemoglobin per 100 c.cm.) completely haemolysed by saponin. The coagulation times of the specimens of plasma so treated were then determined with venom and brain extract (Table II). It is evident from Table II that the acceleration of the coagulation time produced by the addition of blood haemolysed by saponin exceeds that produced by the addition of haemoglobin, which is slight and may not be significant. This result suggests that the factor responsible for the acceleration may not be haemoglobin. Leathes and Mellanby

TABLE I.—*Effect of Haemolysis on Coagulation Time of Plasma (41 Cases)*

No Haemolysis	Slight Haemolysis			Marked Haemolysis		
Time (sec.)	Time (sec.)	Reduction		Time (sec.)	Reduction	
		Sec.	%		Sec.	%
A. With viper venom and oxalated blood:						
15	13	2	13	10	5	33
15	11	4	27	9	6	40
15	15	0	0	9	6	40
15	13	2	13	9	6	40
18	13	5	28	9	9	50
20	11	9	45	9	11	55
20	15	5	25	10	10	50
22	15	7	32	11	11	50
22	13	9	41	10	12	55
22	16	6	27	9	13	59
24	15	9	38	10	14	58
25	14	11	44	11	14	56
25	19	6	24	11	14	56
B. With viper venom and citrated blood:						
13	10	3	23	8	5	37
13	11	2	15	10	3	23
14	11	3	21	10	4	29
15	13	2	13	8	7	47
15	12	3	20	11	4	27
17	19	−2	0	9	8	47
17	15	2	12	11	6	35
20	15	5	25	9	11	55
20	15	5	25	11	9	45
26	12	14	54	10	16	62
29	12	17	59	10	19	66
30	12	18	60	11	19	63
30	16	14	47	11	19	63
30	17	13	43	11	19	63
C. With brain extract and oxalated blood:						
21	21	0	0	21	0	0
25	27	−2	0	25	0	0
29	27	2	7	26	3	10
30	34	−4	0	33	−3	0
33	26	7	21	25	8	24
34	36	−2	0	32	2	6
38	39	−1	0	37	1	3
38	38	0	0	37	1	3
40	32	8	20	31	9	22
D. With brain extract and citrated blood:						
25	25	0	0	25	0	0
26	25	1	4	25	1	4
26	24	2	8	25	1	4
30	28	2	7	25	5	17
33	30	3	9	22	11	33

TABLE II.—*Effect of "Haemoglobin" and of Haemolysed Blood on Coagulation Time of Plasma (17 Cases)*

Plasma (No Haemolysis)	Plasma plus "Ox Haemoglobin"			Plasma plus Haemolysed Blood		
Time (sec.)	Time (sec.)	Reduction		Time (sec.)	Reduction	
		Sec.	%		Sec.	%
A. With viper venom and oxalated blood:						
13	15	−2	0	10	3	23
14	14	0	0	12	2	14
15	20	−5	0	15	0	0
15	13	2	13	10	5	33
15	14	1	7	10	5	33
16	13	3	19	13	3	19
20	18	2	10	10	10	50
22	16	6	27	12	10	46
24	20	4	17	10	14	58
25	25	0	0	9	16	64
B. With brain extract and oxalated blood:						
20	23	−3	0	23	−3	0
24	23	1	4	22	2	8
24	27	−3	0	20	4	17
28	25	3	11	26	2	7
34	28	6	18	24	10	29
35	29	6	17	23	12	34
35	35	0	0	26	9	25

(1939) had already reported to the Physiological Society the potentiating effect of lecithin on the thrombokinase of daboia venom, and we accordingly determined to try the effect of lecithin. Lecithin was added to the venom as already described: we have also added it to the plasma in the proportion of 0.1 c.cm. ovolecithin to 1 c.cm. plasma.

The results of the third series of experiments are given in Table III, which shows that the acceleration of the coagulation time produced by lecithin is of the same order as that produced by "slight" haemolysis. Under the conditions of the experiment the addition of lecithin to the

TABLE III.—*Effect of Haemolysis and of Lecithin on Coagulation Time of Plasma (21 Cases)*

No Haemolysis	Slight Haemolysis			Lecithin					
				Added to Plasma			Added to Venom		
Time (sec.)	Time (sec.)	Reduction		Time (sec.)	Reduction		Time (sec.)	Reduction	
		Sec.	%		Sec.	%		Sec.	%
A. With viper venom and oxalated blood :									
14	8	6	43	12	2	14	11	3	21
15	15	0	0	15	0	0	15	0	0
15	10	5	33	10	5	33	10	5	33
15	9	6	40	11	4	27	10	5	33
20	12	8	40	15	5	25	16	4	20
20	9	11	55	14	6	30	30	6	30
23	9	14	61	14	9	39	9	14	61
24	11	13	54	14	10	42	15	9	38
24	12	12	50	20	4	17	17	7	29
28	14	14	50	25	3	11	15	13	46
28	12	16	57	25	3	11	17	11	39
30	20	10	33	20	10	33	18	12	40
B. With brain extract and oxalated blood :									
20	20	0	0	18	2	10			
21	18	3	14	18	3	14			
21	20	1	5	21	0	0			
22	20	2	9	21	1	5			
25	27	−2	0	22	3	12			
28	27	1	4	24	4	14			
29	27	2	7	25	4	14			
31	31	0	0	31	0	0			
35	36	−1	0	26	9	26			

venom was more efficient than its addition to the plasma. The adjuvant effect of lecithin, like that of haemolysis (Table I), is more apparent when venom is the source of thromboplastin. Again little significance attaches to the differences observed with brain extract.

The effect of haemolysis and of lecithin in accelerating the coagulation time as determined by Quick's method on plasma, in which the prothrombin content is reduced, is shown in Table IV, which gives the results obtained in nine

TABLE IV.—*Effect of Haemolysis and of Lecithin on Coagulation Time of Plasma in Jaundice (Low Plasma Prothrombin) (9 Cases)*

No Haemolysis	Marked Haemolysis			Lecithin added to Venom		
Time (sec.)	Time (sec.)	Reduction		Time (sec.)	Reduction	
		Sec.	%		Sec.	%
A. With viper venom and oxalated blood :						
40	19	21	52	30	10	25
55	14	41	75	25	30	55
60	23	37	62	40	20	33
80	68	12	15	60	20	25
120	115	5	4	130	−10	0
B. With brain extract and citrated blood :						
44	30	14	32	30	14	32
44	34	10	23	40	4	9
46	26	20	43	38	8	17
65	30	35	54	52	13	20

cases of jaundice. Both "marked" haemolysis and the addition of lecithin shorten the coagulation time when either venom or brain extract is the source of thromboplastin. The effect is greater with haemolysis. Even the shortened coagulation times are, however, still grossly in excess of those obtained with apparently normal blood (Table I).

The results of our investigations have been summarized in the accompanying distribution diagram. This shows the wide range of variation obtained when venom is used as the source of thromboplastin. The distribution curve is bimodal, with peaks at 15 and 20 seconds. Diluted venom tends to give times rather longer than those with the more concentrated preparation. When lecithin is added to the venom the coagulation times are shorter and the scatter appears to be reduced. In view, however, of the smaller number of observations it is impossible to be definite on this point. In the presence of haemolysis the coagulation time is further reduced and the distribution curve now shows a single peak at 9 to 10 seconds with a relatively small scatter. This appears to be the best curve of the series. The addition of venom and lecithin to

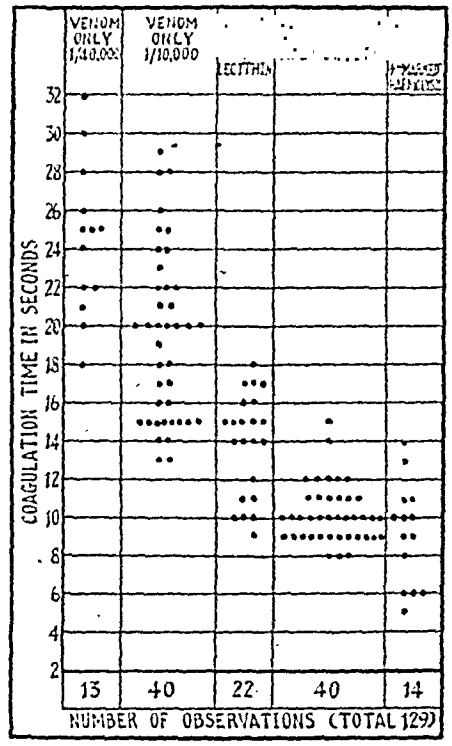


Diagram showing the variation in coagulation time obtained when venom is used as the source of thromboplastin.

haemolysed plasma produces coagulation times which tend to be shorter still, but the data are not sufficient to warrant a definite statement.

Conclusions

The results here set forth would appear to indicate that Russell-viper venom alone is unsatisfactory as a source of thromboplastin. Its action can be potentiated by one or more of the products of haemolysis or by one or more of the constituents of ovolecithin, but it is not possible to say, as Witts and Hobson have done, that the adjuvant effect is due to lecithin. In nine cases of jaundice the effect produced by haemolysis was the greater. A preparation of haemoglobin was also found slightly effective. Acceleration of the coagulation time was greater with venom, but in the jaundiced cases occurred also with brain extract as the source of thromboplastin. In conditions of reduced plasma prothrombin the adjuvant effect of haemolysis and of lecithin can be demonstrated, but the reduced coagulation time still exceeds that of apparently normal blood. The influence of phospholipoids in the coagulation mechanism has been recognized for many years since Howell's original work on the subject, but the effect of haemolysis in accelerating the coagulation time has not been reported hitherto. It is this aspect which we particularly wish to stress. Plasma free from haemolysis contains phospholipins, and the presence of haemolysis adds to their amount to an immeasurably small extent. It would appear, therefore, that some highly active substance is liberated from the red cells. Our results suggest that this may be a phospholipoid. On more mature reflection we wish to retract the last statement in our letter (Crosbie and Scarborough, 1941): we have not been able to decide whether there is any advantage in determining this reduced coagulation time when investigating the presence of low plasma prothrombin. Our results support the valuable suggestion made by Witts and Hobson

that a new technique is available for the study of haemorrhagic diseases in the determination of coagulation time (Quick) with Russell-viper venom before and after the potentiating effect of ovolecithin, but we feel that work of a more specific nature is required before ascribing this effect to lecithin. Special precautions will, however, be necessary to avoid even a trace of haemolysis.

Summary

The effect of haemolysis in accelerating the coagulation time of plasma is recorded.

Experiments dealing with the influence on the coagulation time of the addition of venom and lecithin to haemolysed plasma are described.

The conclusions derived from the investigation are given

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CYCLICAL MUCOSAL ULCERATION

BY

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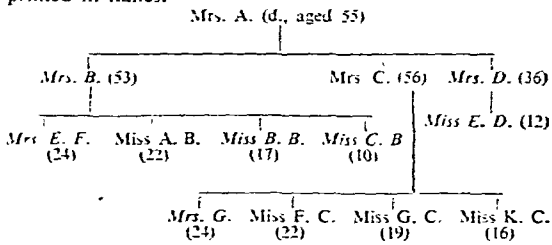
Recurrent buccal and genital ulceration is a syndrome which has attracted but scant attention. Recurring ulceration of the mouth is a common condition, described in textbooks under varying titles—ulcerative stomatitis, dyspeptic ulcers, aphthous ulcers, periadenitis mucosa necrotica recurrens (Sutton and Sutton, 1935), and stomatitis neurotica chronica (Sibley, 1899 and 1914). Recurring ulceration of the vulva was first described by Lipschütz (1913). He called the condition "ulcus vulvae acutum," by which name it is usually known, and in a second paper, in 1923, he reported 51 cases, but only 1 of these also had buccal ulceration.

The coexistence in the same patient of both conditions—namely, non-venereal ulcerative lesions of the mouth and genitalia—was originally described by Neumann (1895). and Wien and Perlstein (1932) in a comprehensive review of the subject could find reports of such a combination in only 30 cases and themselves described a single case. Since then Ravell (1932), Gray (1932), Thompson (1932), Talalov (1934), Hunt (1934), Ziserman (1935), Deuell and Landon (1936), Behcet (1937), Michaëlis (1937), and Tagami (1937) have reported between them 19 cases. In only 9 of the total of 50 cases is there any mention of the effect of menstruation on the ulcers, and in only 6 of these had the ulcers a regular time relation to the menstrual cycle—three cases of McDonagh (1924) and those of Talalov (1934), Ziserman (1935), and Michaëlis (1937). In 5 of the 8 cases recorded below the ulcers bore a constant time relation to menstruation, and it is this association of the ulcers with menstruation that I particularly wish to emphasize.

In all the patients whom I have seen with this condition the stomal and the genital ulcers have always had the same general characteristics. They vary in size from a pin-head to about one centimetre in diameter, and their appearance is preceded by and associated with pain at the site of ulceration, often malaise and depression, and occasionally dyspeptic symptoms. They are superficial, often appearing to start as small papules or vesicles; they are surrounded by an inflammatory halo, their bases covered with a yellow slough, and they heal without scars. I have seen them on the inside of the cheeks, lips, tongue, tonsillar region, and pharynx, and also the labia, vagina, and cervix uteri. The number of ulcers present at one time varies from one to about twelve. They are unassociated with an adenitis.

Of the 8 cases reported below the most interesting is a group of 6 patients, all of whom are near relatives. Mrs. A. died, aged 55, from cancer of the uterus. There is no history that she or her only sister had complained of either buccal or vulvar ulceration. But Mrs. A. had three daughters—Mrs. B., Mrs. C., and Mrs. D.—of whom the first and the last both suffer from recurrent ulceration, as do also three of Mrs. B.'s four daughters, one of Mrs. C.'s four daughters, and the only daughter of Mrs. D. All the male members are healthy.

The following diagram illustrates the position more clearly. Ages are given in brackets and the initials of those who have buccal and/or genital ulceration are printed in italics.



Case Records

Case 1.—Mrs. B., aged 53, has had buccal and vaginal ulcers for twenty years. The stomal ulcers occur on the inner aspect of the lower lip and at the side of the tongue. There is usually only one mouth ulcer present at a time. The vaginal ulcers always occur at the same time as the buccal and are accompanied by a great deal of soreness. All the ulcers appeared two to three days before the onset of menstruation and disappeared during actual menstruation, but they always reappeared for two or three days after the period had ceased. Her menstrual cycle was always regular 3/28 until the menopause, but the flow was scanty and she had severe premenstrual and intramenstrual dysmenorrhoea. Since the menopause the ulcers have still regularly recurred every four weeks. During her four pregnancies the ulceration was always very much worse, but it improved following delivery. The only investigation has been a blood Wassermann, and this was negative. She has had no treatment whatsoever for the condition. Mrs. B. has four daughters, and three of these have ulcers. The eldest, Mrs. E. F., has genital and mouth ulcers, but further details about her are not available.

Case 2.—Miss B. B., aged 17, the third daughter of Mrs. B., has had mouth ulcers for eighteen months but no genital ulcers. The ulcers have occurred regularly every four weeks, and last for one or two days. Although she is nearly 18 she has never yet menstruated, and secondary sexual characteristics have not appeared. Her general nutrition is poor and she is pale. Apart from these facts there are no other positive findings, and no investigations have been undertaken. She has not had any special treatment.

Case 3.—Miss C. B., aged 10, the fourth daughter of Mrs. B., has been troubled with ulcers on the side of her tongue at irregular intervals for the last eighteen months. Recently they have been very large and painful, previously having been only small and causing little inconvenience. She is a well-built, healthy-looking child, and there is no evidence of infection of her teeth, tonsils, or sinuses. No investigations or special treatment have been undertaken.

Case 4.—Mrs. D., sister of Case 1, is aged 36, and has had ulceration of the mouth and vulva since the age of 12—two

years before the onset of menstruation. The buccal and genital ulcers occur simultaneously two or three days before the onset of menstruation. They invariably disappear as soon as menstruation starts, but reappear for the two or three days following the cessation of the period. The menstrual cycle is regular 3/28, and there is no dysmenorrhoea. She is an exceptionally healthy-looking woman, and apart from the ulcers there are no positive physical signs. She has never had any treatment for the condition, and no investigations have been done. She has one son and one daughter, the latter also suffering from ulcers. During the two pregnancies the ulcers were very much worse.

Case 5.—Miss E. D., aged 12, the daughter of Case 4, has had ulceration of her tongue and cheeks frequently, but at irregular intervals, during the last twelve months. She has not yet started to menstruate and appears to be a healthy child, no abnormalities having been observed on clinical examination.

Case 6.—Mrs. G., aged 24, niece of Cases 1 and 4, has had recurrent buccal ulceration since childhood. The ulcers occur at irregular intervals and last one or two days. They have no relation to her menstrual cycle, which is regular. There is no history of genital ulceration. She has two daughters and one son, all of whom are healthy and free from ulcers. Her mother and three sisters are also not affected. She is the only daughter of Mrs. C. who bears a strong resemblance both in appearance and in temperament to Mrs. B. (Case 1).

Case 7.—Mrs. J. was 21 when I first saw her. She then had an acute bronchitis, and remarked casually that an ulcer in her mouth was a little troublesome. On questioning I discovered that she had had ulcers of the mouth regularly every month, one week before the onset of menstruation, for two and a half years. The ulcers lasted until the period began. There is no history of genital ulceration. The menstrual cycle is regular 3/28, and there is no dysmenorrhoea. Apart from bronchitic signs nothing abnormal was discovered on clinical examination. She refused further investigation. For the last two years I have been in frequent communication with her. During this period she has been entirely free from ulcers, although she has had no treatment.

Case 8.—Miss L., aged 45, was first seen by me when she had typical angioneurotic oedema of her face and arms. On routine examination ulcers were found in the mouth. Questioning elicited the fact that she had suffered from these for over three years. They always began one week before menstruation and lasted until the period started. There is no history of genital ulceration. Until twelve months ago her menstrual cycle was regular 5/28. Her general condition is good and, apart from the ulcers and recurring angioneurotic oedema, which bear no time relation to one another, clinical examination was negative. A blood Wassermann was negative and a blood count showed 4,232,000 red cells and 7,600 leucocytes per c.mm. with a normal differential count and 85% of haemoglobin.

One c.cm. of antuitrin S was given daily for one week before the expected onset of the ulcers. After the second course no ulcers occurred that month for the first time for over two years, and the following month she had only one small ulcer. The next month the ulcers were as bad as ever and, in view of the fact that the injections appeared to cause severe constitutional upset, 100 units of pregnyl and 20,000 units of oestroform were substituted. During the following three months she had only two small ulcers and the associated pain was much less; but she developed a severe epimenorrhagia, and so the pregnyl was discontinued and the oestroform given alone. The following period was normal, but the ulcers were very severe. The next month, after a further course of oestroform, she had amenorrhoea and was free from ulcers. Since then she has had 100 units of pregnyl on each of the seven days preceding the expected onset of the ulcers, with varying success. Although the condition has somewhat improved it cannot be regarded as cured.

Aetiology

In discussing the various opinions as to the aetiology the main difficulty is to attempt to elucidate whether or not the authors were describing the same condition as is reviewed in this paper. The exact relation of this syndrome of cyclical mucosal ulceration to similar conditions reported by other writers is hard to assess.

Lipschütz (1923) regarded *Bacillus crassus* as the causal organism of ulcus vulvae acutum and considered the finding of this bacillus as essential for the diagnosis. *B. crassus* is closely related morphologically to, if not identical with, Döderlein's vaginal bacillus. Several authors believe that recurrent buccal and genital ulceration occurring in the same patient is also due to *B. crassus*. But this organism is often in vaginal swabs of patients who have no ulceration: repeated attempts at auto-inoculation have all proved negative, and in only 4 cases has *B. crassus* been found in mouth ulcers.

Talalov (1934) described a patient in whom ulceration of the mouth and vulva was associated with a pustular eruption of the face and trunk which later ulcerated in parts. *B. crassus* was seen in a section taken through one of these ulcers and was isolated from the vulva but not the mouth. That author expressed the opinion that the patient had a generalized *B. crassus* infection, and quoted the case of Samek and Fischer (1929) of a girl of 19 who had ulceration of the vulva and a lesion of the legs resembling erythema nodosum. *B. crassus* was recovered from the genital ulcers, the skin nodes, and a blood culture.

Planner and Remenovsky (1922), Schnabl (1927), Samek and Fischer (1929), Kumer (1930), Jaffe (1930), Matras (1932), Whitwell (1934), Talalov (1934), and Hunt (1934) have each recorded a single case of recurrent ulceration of the mouth and/or of the vulva in association with skin lesions which either resemble erythema nodosum or are papular and may ulcerate. The skin lesions have been regarded by some as tuberculides, but others consider the whole condition to be a type of erythema multiforme. Talalov suggested that the skin eruption is an allergic manifestation of a *B. crassus* infection.

Cantrell (1934) and Grant (1934) have each reported a case of combined vaginal and buccal ulceration due to the diphtheria bacillus, but it is highly improbable that any of the cases above recorded were due to this organism. Kumer (1932) considered, on experimental grounds, that recurrent stomal ulceration is an atypical herpes infection, but this view has had very little support and no confirmation.

An endocrinous theory of origin appears more entertaining than an infective one, but is even more difficult to prove. Ziserman considered that because his case cleared up with anterior pituitary lobe extracts and stimulating *x*-ray doses to the pituitary he had established the endocrinous nature of the condition. Four of my cases appear to support an endocrine basis strongly, but the evidence is far from conclusive. Perhaps it is of some importance to note that amenorrhoea, physiological or otherwise, was associated with amelioration of symptoms in some cases and with aggravation in others. The syndrome of recidivating buccal and genital ulceration seems to be peculiar to women. If this really be so, what is the significance?

McDonagh (1924) reported a case in which the ulcers of the vulva occurred immediately after the cessation of the menstrual period, and he mentioned that he had seen two similar cases. *B. crassus* was found in all three, and McDonagh stated: "Menstruation does lower a woman's resistance, and doubtless in these three cases it sufficed to render a saprophytic organism pathogenic." Opposed to such a viewpoint is the fact that in 4 of my cases the ulcers started before the onset of the period, the possible exhausting effects of which cannot therefore be considered a contributory factor.

Parkes Weber (1932), in a discussion on the subject, suggested that the primary factor was not a local infection but rather some condition of the mucous membranes analogous to epidermolysis *bullosa*, which is not necessarily hereditary. The familial incidence of the condition in 6 of my cases favours such an interesting idea.

In view of the occurrence of mucosal ulceration in agranulocytosis the possibility of such a condition in these patients has to be remembered. No investigated case has had a neutropenia. Embleton (1937) described the interesting case of a girl who had ulceration of the mouth regularly every seventeen to nineteen days, the attacks always being coincident with a marked neutropenia, the leucocyte count being normal between the paroxysms. Embleton states: "There is no relationship between the swing of the rhythm and the menstrual periods." But unless the menstrual cycle was extremely irregular it is difficult to understand how this could have been the case.

I suspect that cyclical mucosal ulceration, at any rate as a partial syndrome, is far commoner than is generally believed. Possibly many girls who have genital ulceration do not seek medical advice because of false modesty, especially if they are single. In cases of stomal ulceration the relation to menstruation may not be volunteered by the patient even if present or be asked about by the doctor, who is probably unaware of such an association. Almost all previously published cases have been severe, but some of mine were mild and lead me to suppose that frequently the condition does not trouble the patients enough to make them consult a doctor, and Case 7 of my series indicates that spontaneous cure does apparently occur.

I wish to emphasize that none of the 8 cases described above has ever been an in-patient of any hospital.

Summary

Eight cases of cyclical mucosal ulceration are described, six of the patients being near relatives. The ulceration affected the mouth in all cases, and in two the genital tract was also involved.

My thanks are due to Dr. E. Pearson, without whose help this paper would probably never have been written.

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SOME RECENT AIR-RAID CASUALTIES

BY

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AND

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The treatment of air-raid casualties at this hospital during the past few weeks is here recorded because a few points have arisen which may be of value in the conduct of further cases.

First Series of Cases

Twenty-three casualties were brought to hospital; the injuries were due mostly to the direct action of the explosive, the distribution of the fragments being such that nearly all the lesions were in the lower limbs. Of the 23 patients 6 were dead or died within a few minutes of admission. Of the remainder, 8 died within twelve hours and 9 survived. These 17 patients were admitted to the receiving ward within thirty minutes of the time of injury, and resuscitative treatment was started immediately. They were all between the ages of 19 and 30; their lesions were lacerations or compound fractures of one or both lower limbs, with shock and local injury roughly in proportion. It was found that they could be put into one of two groups with reference to severity of the shock and treatment (and, one might add, prognosis also, as was unfortunately confirmed by the poor results of resuscitative treatment). One group, containing 9 cases, were all suffering from severe shock and had comminuted compound fractures of one or both lower limbs. The other group, consisting of 8 cases, only slightly shocked, had multiple lacerations, some also with compound fracture of one limb.

The former group were from the start too ill to allow of immediate operation; they were all in the clinically recognizable state of severe shock and had to be resuscitated before operation could be considered. They were given morphine and blood or plasma transfusions. In not one case was there bleeding from a large artery. The results of resuscitation treatment were extremely disappointing. Of these 9 patients 8 progressively became worse, and they died in ½, 3¼, 4, 6½, 6½, 6½, 8, and 11 hours. The other patient improved sufficiently for operation to be performed after six hours, and after much anxiety he survived. The second group never really gave rise to any doubt about their treatment and immediate prognosis. All 8 were operated on within six hours, mostly by excision and plaster, and have done extremely well.

It is not proposed to describe the general organization or the routine treatment, which was on generally accepted lines, as frequently described in recent articles (Cohen and Schulenburg, 1940; Hodgson and McKee, 1940). The operative technique was that described by Cohen and Schulenburg in their excellent paper, except that in their cases "no attempt at excision or trimming of muscle was made," whereas in our cases excision of damaged muscle was regarded as an important step in the procedure. A few cases only will be detailed, as they were of uniform type in the two groups. Of the 9 patients with severe shock the following case was typical:

A man aged 22. Compound comminuted fracture of upper end of left tibia and fibula with much destruction of tissue and the limb almost completely severed; a tourniquet had been applied just above the knee. This patient was suffer-

THE METABOLISM, EXCRETION, AND HUMAN REQUIREMENTS OF CALCIUM

BY

R. A. McCANCE, M.D., F.R.C.P.

(*From the Department of Medicine, University of Cambridge*)

Until the Government decided to fortify bread with calcium in the interests of national health the metabolism of this element had been the concern only of specialists in the subject. These international investigators, many of them with years of research and clinical experience behind them, had established certain facts as beyond all question, and it was no doubt on the weight of their findings that the Government based its proposal. As so often happens in this country of free and independent thought and speech, the Government's scheme was immediately criticized in various ways, counter-measures were put forward, and for the last six months or more the whole matter has been hotly debated in the lay and medical press.

In matters of this kind only people who are familiar with the facts can form any sound judgment. Those who are not tend to be swayed by the party which is able, or takes the trouble, to make the most noise. It may be of value, therefore, to outline briefly some of the generally accepted facts about calcium metabolism, and in their light to discuss an article which has recently appeared in this *Journal* (Harris, Ireland, and James, 1941).

Storage of Calcium

Calcium is an element which is essential for life and health and which at the same time is not at all easily absorbed. There are several reasons for the latter. One is the valency of the element, divalent cations being absorbed much less readily than monovalent. Another is the tendency of the element to form salts which are insoluble in the intestinal juices. Nevertheless, the requirements of bones and teeth demand that children shall store calcium at the rate of about 2 grammes per week from the time they are born till they are 17 or 18 (Leitch, 1937). Absorption and storage are facilitated by vitamin D, but no amount of vitamin enables a child (or an adult) to dispense with calcium itself. If children are to store 2 grammes per week they should be supplied with *at least* three times this amount, because much of the calcium in the food always escapes absorption and some of the calcium which is absorbed is inevitably excreted in the urine or finds its way back into the intestine as a constituent of the digestive juices. Adults require less calcium than children because their bones and teeth are fully formed, but their needs for maintenance are just as important. If sufficient calcium is not supplied to adults their bones tend to become rarefied and therefore liable to fracture (Owen, Irving, and Lyall, 1940).

Most of this knowledge of human calcium requirements has been gained by experiments in which the intake of calcium in the food has been balanced against the output in the urine and faeces. These experiments are not easy to carry out, and considerable experience is required to make them a success, but many satisfactory ones have now been performed, and from them it is easy to see in any particular instance whether the calcium in the food has been sufficient to promote satisfactory storage or maintenance. The papers of Bauer, Albright, and Aub (1929) and of Hunscher *et al.* (1934) contain excellent examples of such work, and for a summary, review, and application of such investigations Leitch's (1937) article should be consulted. The last word has naturally not been said, but certain facts are clear. One is that the amount of calcium retained by a normal adult over any given period of time is never more than a small percentage of the intake. Another is that normal men and women excrete 10 to 50% of their intake of calcium in the urine, 50 to 90% in the faeces.

If more calcium is absorbed than the body requires the excess is excreted in the urine. The amount so excreted is always small, and variations in it make no appreciable difference to the total osmotic work of the kidney, most of which is devoted to the excretion of urea, sodium, potassium, chlorides, and phosphates. Thus Borsook and Winegarden (1931), who set out to calculate in great detail the osmotic work performed by the kidney in producing one litre of urine, came to the conclusion that the total work amounted to 704 gramme calories and that the quota of this due to the calcium ion was only 1 gramme calorie—i.e., about 0.14%. Previous estimates of the total work of the kidney in producing a litre of urine had been of the same order (Cushny, 1926), and the principles and methods of all these authors were accepted as being substantially correct by Eggleton, Pappenheimer, and Winton (1940).

Optimum Calcium Requirement

On January 11 a paper by Harris, Ireland, and James appeared in this *Journal* entitled "Optimum Calcium Requirement." To the public and to most of the medical profession this article probably bears the stamp of having been written by experts and as such commands respect. Indeed, the views of the authors have already been given wide publicity, and it is because of this that I have ventured to write this cautionary note. To those who have made a careful study of physiology and calcium metabolism there are many features of this article to which serious exception must be taken. The section of the article headed "Calcium Balances" illustrates this. The authors give a series of balances in adults and discuss them as an integral part of the paper. A table shows the averaged intakes and excretions at different levels of intake. In every case the urinary exceeds the faecal calcium, sometimes by two to three times! Furthermore, some of the retentions of calcium amount to over 70% of the intakes. It is most unlikely that all previous investigators have been wrong on these two points and that Harris *et al.* alone are right. Yet the latter make no reference to any previous work. Surely some of it was known to them. There is no doubt that experienced investigators, finding themselves in disagreement with all previous workers, would not have published their findings without a full description of their methods and the steps they had taken to satisfy themselves that their results were the correct ones. Harris *et al.* have furnished us with none of this information.

Later in the article Harris *et al.* take up the question of the work of the kidney at various calcium intakes. They quote without reference (but with a spelling mistake) a formula for determining the work of the kidney and give some results of their own. They claim that lowering the calcium intake reduced one person's kidney work from 18.8 to 5.1 litre atmospheres/litre and another's from 14 to 0.9 litre atmospheres/litre: 14 litre atmospheres is the work equivalent of 339 gramme calories. If this figure is compared with those of Borsook, to which reference has just been made, it will be seen that it is too small to be a reasonable estimate of the total work of the kidney, and 0.9 litre atmospheres (21.8 gramme calories) is ridiculously small. One is forced to conclude that there is something radically wrong with Harris's figures. Furthermore, when it is recalled that, according to experienced authors (Borsook and Winegarden, 1931), the work done by the kidney on the calcium ion forms only 0.14% of the

total work, it is impossible to see how any physiological or pathological change in the excretion of calcium could possibly produce a significant rise or fall in the total work of the kidney.

Positive Calcium Balances

One further point. Under the heading "Positive Calcium Balances" Harris *et al.* allude to experiments on rabbits in which the animals were given diets rich in calcium, and their aortae subsequently analysed for this element. In a short table figures are given for *two* experimental animals and *one* control. The former's aortae contained 16.2 and 16.9 mg. calcium 100 grammes and the latter's 9.0 mg./100 grammes. These findings are claimed to be of significance to those interested in the aetiology of clinical arteriosclerosis, and they are employed to emphasize the dangers of high calcium diets in man. Now rabbits are animals which are well known to vary considerably among themselves. They are much less uniform than the inbred laboratory rat, and large numbers have to be used to establish differences of this kind. Yet Harris *et al.* do not give the number of animals used or their diets. They say nothing about the times for which the diets were administered, nor do they even mention the range of variations in the normal or in the experimental animals. Moreover, even if these experiments were repeated and confirmed it would not follow that the same would happen in man. Apart from the differences normally found between species, the rabbit's aorta is peculiarly liable to atheromatous degeneration when the diet is rich in cholesterol, and it may have an equally unusual calcium metabolism. So far as man is concerned there is no evidence that a high calcium diet leads to a deposition of calcium in healthy tissues. If there are degenerating areas in the body calcium phosphate may be deposited therein, whether the intake is high or low.

The results described in the article under criticism will carry no weight with the professional scientists until they have been repeated and confirmed by independent authorities. It is very much to be hoped that the public and the medical profession will take the same view.

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It is the object of the Cicely Northcote Trust, attached to St. Thomas's Hospital, to experiment in new forms of social service and to extend the social work of the lady almoner's department from the out-patients and casualty cases to the ward patients and their families. The thirty-first annual report contains no statistics or audited accounts for the very good reason that many of the records, case papers, and books were lost in the destruction which befell parts of St. Thomas's Hospital by enemy action. The workers, however, were unharmed and the work has gone on. Throughout the year, in spite of calamity and disorganization, it has been possible to continue the systematic care of all the patients suffering from cancer. The plight of these patients during the early part of the war, when chronic wards were in many cases emptied and homes for cases of advanced disease ceased to admit, was often a desperate one. Some of these people have now been evacuated to the country, but it is stated that while a number are delighted by the peaceful surroundings, there are others who look upon the experience as one to be endured rather than enjoyed, and some who refuse to leave the part of London they know and, in addition to the sufferings entailed by their malady, face outside danger and discomfort with quite extraordinary courage.

Clinical Memoranda

Carbuncle of the Duodenum

The following case has three points of interest: (1) the difficulty in pre-operative diagnosis; (2) the unusual finding in "acute abdomen"; and (3) the satisfactory response to heroic treatment in an aged patient.

CASE REPORT

A woman aged 84 was admitted to hospital on December 5, 1940, complaining of continuous acute abdominal pain of five days' duration. The pain was generalized in the abdomen, but was most severe in the right upper quadrant. There was no complaint of nausea or vomiting. The previous history was negative for serious or relevant illness.

On admission the examination showed the patient to be well preserved for her age. There was no evidence of jaundice. The temperature was 98° F., the pulse 88, and the respiratory rate 22. Nothing abnormal was detected in the various systems beyond a degree of arteriosclerosis and a systolic murmur at the apex. The abdomen showed limited respiratory excursion and a girdle of pigmented moles at the waist-line. On palpation there was generalized tenderness, most intense in the right hypochondrium. A freely movable rounded mass about the size of a hen's egg could be felt immediately to the right of and slightly above the umbilicus. Liver dullness was normal, and localized dullness was elicited over the tumour. The remaining areas of the abdomen were uniformly tympanitic. On auscultation bowel movements could be heard. A tentative diagnosis of acute cholecystitis was made, and the patient received expectant treatment during observation.

On December 6, there being no improvement, laparotomy was performed by Mr. Richard Warren, through a right paramedian incision, under gas-oxygen-ether anaesthesia. On opening the peritoneum a mass covered by omental tags was seen in the right upper quadrant. The gall-bladder was identified and exonerated. The fundus of the stomach was traced down into the omental-covered mass, which was only slightly adherent and was easily stripped off. The lesion was then seen—a carbuncle, oval in shape, two inches by one inch, situated on the anterior surface of the first part of the duodenum. There was no macroscopic perforation into the peritoneal cavity, but six necrotic "pointing" areas were noted under the membrane. On palpation it was thought that an ulcer crater the size of a sixpence could be felt centrally in the carbuncle within the lumen of the bowel. The lesion was oversewn with a continuous catgut suture, and posterior gastro-jejunostomy performed.

Unfortunately, bacteriological investigation was inopportune, but 1 gramme of prontosil soluble was given empirically, twice daily for five days by the intramuscular route. Recovery was uneventful and the patient was discharged well on December 30.

Our thanks are due to Mr. Richard Warren, honorary surgeon to the hospital, for permission to record this case.

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House-physician.
CYRIL A. ANDERSON, L.R.C.P. & S.I.,
General Hospital, Weston-super-Mare. House-surgeon.

Note on the Treatment of Acute Bacillary Dysentery with Sulphapyridine

The treatment of acute bacillary dysentery with sulphapyridine (M & B 693) has proved with us to be highly efficient. We have treated 20 patients (dysentery Shiga, 4; Flexner-Y, 13; Strong, 1; Sonne-E, 1; Schmitz, 1) with results so uniformly good even in the severe cases that we feel justified in publishing our observations in spite of the relatively small number of cases. It should be pointed out, however, that the drug seems to have no effect whatsoever in amoebic dysentery.

All our patients were adults suffering from severe or moderately severe bacillary dysentery. Mild cases have not been

treated, and cases without subsequent bacteriological confirmation, though treated, have not been taken into consideration. The treatment was started on the second day after admission to hospital, the first day being used for observation in order to compare the patient's condition before and after the administration of the drug. One gramme (two tablets) of sulphapyridine was given by mouth (together with sodium bicarbonate in order to avoid nausea) three to four times daily for two to four days, according to the time taken in recovery. As a rule the drug was administered until one day after the motions became formed. No other treatment was given.

Usually twenty-four hours after beginning the treatment the fever dropped and the diarrhoea was greatly improved as to the frequency of motions and the appearance of the stools. After forty-eight hours' treatment the motions were back to normal in nearly all cases, irrespective of the duration of the disease previous to treatment and the type of the dysentery bacillus. In three instances it took three days and in one case four days to achieve this result. Tenesmus and vague sensations of uneasiness in the abdomen were felt for one or two days more by some patients. General toxic symptoms, though not very severe, observed in one Flexner and two Shiga cases, also improved very rapidly. The stools were found bacteriologically negative as soon as they became formed, and relapses have not been observed. It might be hoped, therefore, that chronic colitis which develops so often as a sequela even after mild cases of bacillary dysentery will be prevented by this treatment.

The accompanying table summarizes our results. The number of motions a day is used as the symptom best indicative of the patient's condition. The first day of hospitalization (observation day) serves for comparison with the ensuing days of treatment.

Table showing Results of Sulphapyridine Treatment of Bacillary Dysentery

Case No.	Type of Dysentery	Day of Disease when Admitted	Motions per Day						Duration of Sulphapyridine Administration (Days)
			Observation Day	Day of Treatment					
				1st	2nd	3rd	4th	5th	
1	Flexner-Y	3	26	8	2	1	1	1	2
2	Flexner-Y	3	23	8	1	1	1	1	2
3	Shiga	6	29	13	8	3	2	1	4
4	Flexner-Y	2	46	52	10	3	3	1	4
5	Flexner-Y	2	34	38	19	0	1	1	3
6	Flexner-Y	2	19	30	4	2	1	1	3
7	Shiga	6	56	13	0	0	1	1	2
8	Flexner-Y	4	8	10	0	1	1	1	2
9	Sonne-E	6	15	11	4	1	1	1	2
10	Flexner-Y	9	14	4	3	2	1	1	3
11	Flexner-Y	3	18	16	0	1	1	1	2
12	Strong	1	9	12	2	1	1	1	3
13	Flexner-Y	4	14	16	5	1	1	1	3
14	Flexner-Y	1	8	15	6	1	1	1	3
15	Shiga	4	30	26	35	19	6	2	4
16	Flexner-Y	1	30	12	4	0	1	1	3
17	Schmitz	2	8	14	4	2	1	1	4
18	Flexner-Y	2	8	9	6	2	3	1	4
19	Shiga	5	30	19	8	1	2	1	3
20	Flexner-Y	2	18	20	2	0	1	1	3

We wish to express our thanks to Col. G. W. Heron, Director of Medical Services, Palestine Government, and to Dr. G. Stuart, Deputy Director (Laboratories), for permission to publish this article.

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P. Pribat (*Thèse de Paris*, 1940, No. 168) states that of the complications caused by beauty cures and cosmetic preparations the most serious are those due to hair dyes and decolouring agents. The largest number of cases of dermatitis are caused by tinctures containing aniline derivatives. The dermatitis is due to individual intolerance and in every respect resembles the complications of chemotherapy. Prophylaxis consists in the application of a skin test made from twenty-four to forty-eight hours before the use of the tincture. The complications belong to the group of allergic affections whose pathogenesis is still obscure.

Reviews

ORTHOPAEDIC OPERATIONS

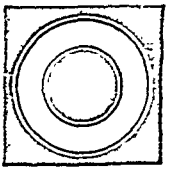
Orthopedic Operations: Indications: Technique and End Results. By Arthur Steindler, M.D., F.A.C.S. (Pp. 766; 322 illustrations. 50s.) London: Baillière, Tindall and Cox.

This book is a mine of information based on the experience of one who has spent a surgical lifetime in the practice and teaching of orthopaedics. The material is well organized and illustrated and there are many references. The author does not confine himself to description of orthopaedic procedures, but devotes some space to indications, results, etc. Considering the great number of operations on the locomotor system that have been described it is not possible to include them all in one volume. However, as the author points out in the preface, many operative procedures have been omitted because their validity did not impress itself sufficiently or they represented merely irrelevant variations of a general principle.

The subject-matter is presented as follows: The book is divided into three sections. The first deals with general principles pertaining to orthopaedic operations from all points of view—biological, anatomical, pathological, and clinical. It is brief and therefore in some respects incomplete. Some of the subject-matter would have been better left to more general textbooks—for example, the diagnosis and treatment of acute dilatation of the stomach. There is a short, well-illustrated section on regional anaesthesia. The last chapter in the first section is a description of the surgical approach to the various regions of the body, and includes sufficient references to the surgical anatomy to make the method of approach clear. The second section, "The Technique of Orthopedic Operations," is divided into several parts depending on the type of tissue—tendons, fascia, ligaments, bones and joints, nerves, skin, etc. Each one of these chapters contains an adequate description of all the well-known orthopaedic procedures relating to the particular type of tissue. The book itself is well worth reading, and this particular section is of great value to the orthopaedic surgeon. The third section is concerned chiefly with the indications for operations and end results in specific orthopaedic conditions. These specific conditions completely cover the field of orthopaedic surgery. This section is not for the beginner. Many controversial subjects are raised, and the author expresses opinions sometimes in a dogmatic manner that would be actively contested by many orthopaedic surgeons. The breadth of the subject covered in this section enforces brevity which sometimes leads to statements that might be misleading—for example, in the discussion of scoliosis it is stated that in the congenital type it may be advisable to fuse a primary lumbar and a secondary dorsal curve. This follows a reference to the Risser methods of correction. It would be unfair to suggest that misleading statements are frequent: they only occur in the more controversial subjects, and chapters discussing such subjects as congenital deformities and spastic paraplegia are masterpieces of clarity and completeness and reflect the author's wide experience.

The rather unusual manner in which the subject-matter is assembled may make it necessary to refer to several chapters to get all the desired information. This is facilitated by a complete index of authors, operations, and conditions. Criticisms of this volume are prompted by the dictates of perfection. Every surgeon doing orthopaedic work will find it of inestimable value.

A NEW NOTE is sounded in the management of NORMAL PREGNANCIES . . .



by Fall's advice, that progestin be used prophylactically to guard against abortion in expectant mothers who must make long journeys, who suffer severe mental shock occasioned by the receipt of bad news, etc., or who are the victim of febrile disease, in which the hyperpyrexia might induce an obstetrical accident. Ill. Med. J., 76, 507, 1940.

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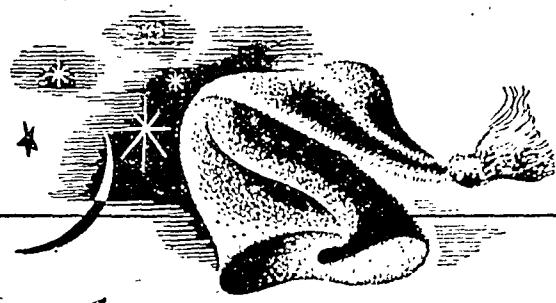
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Advice on the attainment of sleep

Let your night cap be of scarlet; and this I do advertise you, to cause to be made a good thick quilt of cotton, or else of pure flocks or of clean wool, and let the covering of it be of white fustian, and lay it on the featherbed that you do lie on . . .

ANDREW BADE (Advice on the attainment of sleep from "A Compendious Regyment 1557")

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RADIOGRAPHY OF HEART DISEASE

Atlas of Cardio-Roentgenology. By Hugo Roesler, M.D., F.A.C.P. (Pp. 124; 166 illustrations. $8.50 post paid, or £2 7s.) Baltimore: Charles C. Thomas; London: Baillière, Tindall and Cox. 1940.

Prof. Roesler's monograph contains not only an excellent series of *x*-ray photographs illustrating the common forms of heart disease, but also many photographs of hardened specimens by which the anatomical and *x*-ray changes may be correlated. The *x*-ray silhouette of the heart and great vessels is, of course, flat or two-dimensional, but by further comparison of the actual organs a truer conception of the *x*-ray appearances in terms of volume, or three dimensions, is possible. Throughout the subject is treated by the presentation of actual cases, including the history and clinical findings, *x*-ray appearances and electrocardiogram, and photographs and descriptions of the corresponding specimens, which are shown sectioned in several planes. In some instances *x*-ray pictures of the specimens after injection with opaque material are also reproduced. First the radiological and anatomical appearances of the normal heart are studied at different age periods and with different positions of the diaphragm, then the various causes of cardiac enlargement and displacement. A striking illustration is given of the changes in heart volume, pulse rate, and electrocardiogram which occur in postural circulatory deficiency. Coronary artery disease is visualized directly by the *x*-ray demonstration of calcification in the arteries, and the various results of cardiac infarction are well shown. Calcification in valves and pericardium, which is not easy to record radiographically and probably often missed, is clearly demonstrated. Other common lesions of heart, vessels, oesophagus, and mediastinum are adequately represented. The book is extremely well produced and its study will be found a pleasure.

WAR SURGERY

Surgery of Modern Warfare. Part I. Edited by Hamilton Bailey, F.R.C.S. Section I: Wounds: General Considerations. Section II: Special Considerations. (Pp. 160. 12s. 6d. net, plus 6d. postage.) Edinburgh: E. and S. Livingstone. 1940.

This book is the first part of a symposium on war surgery under the editorship of Mr. Hamilton Bailey, and the later parts will be published from time to time. The names of no fewer than sixty-five contributors appear at the beginning of the work, and this accounts for some of the editor's difficulties in controlling his team. With such a galaxy of talent it is almost inevitable that there should be some lack of balance in the various chapters, certain inconsistencies, and in places too much enthusiasm on the part of individual contributors. The present volume is devoted to a consideration of the general and special features of war wounds and their treatment. It includes accounts of projectiles, the classification of wounds, the treatment of shock, the uses of transfusion and infusion, and chapters dealing with the various types of wound infection and their treatment. Some of the important sections suffer by being over-compressed. This is particularly true of the chapter dealing with burns, which is excellent but not nearly detailed enough for a work of this sort. The chapter on transfusion and infusion is, on the other hand, extremely complete. One of the greatest difficulties that the editor and his contributors have had to face is the fact that at the present time surgical ideas of wound therapy are in an unusually fluid state. For this the experiences of the Spanish war with the closed-plaster treatment and the introduction of chemotherapy are largely responsible. The chapter on chemotherapy is by Dr. W. R. Thrower, who is described as consulting physician to Messrs. May and Baker Ltd. The introductory paragraph of this seems to ignore some of the earlier work on modern bacterial chemotherapy. The contributor further suggests that the use of sulphonamides locally appears "quite irrational." Yet, in a later section dealing with gas gangrene, another contributor specifically advocates the direct application of sulphonamide powder for these anaerobic infections. In the matter of dosage this latter contributor suggests that 15 *grains* is the maximum dose recommended. This should be 15 *grammes*. There is no account of serum therapy in the treatment of gas gangrene, though experimental evidence supports its use, but a full account of the use of *x* rays is given. One contributor condemns the fluoroscopic removal of foreign bodies, while a later one advocates this and describes the method in detail.

This book is very readable, well produced, and well illustrated. In attempting such a work Mr. Hamilton Bailey has called to his assistance too much talent rather than too little, and he has the added difficulty of the present rapidly changing scene in the sphere of wound therapy. It is to be hoped that in the later parts of the work the lack of balance between the various sections, the inconsistencies, and the tendency to over-simplification of some of the sections will be corrected or overcome.

VULVAR DISEASES

Diseases Affecting the Vulva. By Elizabeth Hunt, B.A., M.D., Ch.B. (Pp. 215; with 36 illustrations, and 18 plates in colour. 21s. net.) London: Henry Kimpton. 1940.

Dr. Elizabeth Hunt's book on diseases affecting the vulva is a valuable addition to the practitioner's library. It is the product of many years' study, and is both scientific and practical. The most interesting and novel view put forward in this volume is that lichen planus attacks the vulva far more commonly than is generally supposed and that it is one of the common causes of pruritus, and, moreover, that one form of it is identical with the leucoplakic vulvitis described by Bonney which later develops into the atrophic condition known as "kraurosis." Here she differs from another authority, Dr. Agnes Savill, who is of opinion that kraurosis is a terminal stage of an infective recurring dermatitis. There is undoubtedly very considerable difficulty in unravelling the relationships of the various chronic eruptions and changes that affect this region, and not very much help is to be gained from the histological evidence afforded by biopsy. Careful following up of the clinical histories of the patients is essential, and as pruritus is usually a leading sympton the sufferers are very prone to wander about from hospital to hospital or doctor to doctor, and thus baffle the investigator. Dr. Hunt has devoted a large proportion of her book to the study of this question, and of eighteen coloured illustrations no fewer than eleven are devoted to some form of lichen planus. In some cases we rather fancy that other dermatologists would not agree with the diagnosis, but undoubtedly serious consideration must be given to Dr. Hunt's main proposition, which is that lichen planus is far more often responsible for vulvar disease than has previously been supposed. Among the questions which arise from the discussion of this point is the very important one of the relation between the different forms of lichen planus and the incidence of malignant disease. In other parts malignancy and lichen planus do not seem to run together. In the vulvar region epithelioma not infrequently supervenes on leucoplakic vulvitis. This is a point which needs explanation.

One practical warning is given by Dr. Hunt to practitioners when she points out that the vulva is for the most

part an area of skin rather than of mucous membrane; hence inflammatory changes here need treating as a dermatitis; and hence the poor results obtained from the administration of alkaline hip-baths, too often prescribed in cases of pruritus. Finally, we must add a word of praise for the coloured illustrations made by the Dufay process. The besetting sin in this method of colour photography is that it is liable to exaggerate the reds, but in these plates this fault has been largely avoided. The book is exceedingly well got up. We recommend it to dermatologists, and perhaps even more warmly to gynaecologists.

Notes on Books

A cheap edition of Mr. SIDNEY FORSDIKE'S *Textbook of Gynaecology* has been published by William Heinemann (Medical Books), Ltd., at 7s. 6d. If the advances in knowledge of the last five years are forgotten while this useful little edition is read the reader will be impressed by its amazing value. It is concisely written, lavishly illustrated, and filled with sound clinical teaching and accurate observations. Since the original text was written, however, hormone activity has been more thoroughly investigated and endocrine therapy has developed on a rational basis, the sulphonamide drugs have proved their worth, endometritis has been recognized as a pathological entity not to be confused with stages of normal endometrial proliferation, and valuable work has resulted in a better understanding of the pathology of ovarian tumours. In view of these and other developments it is to be regretted that no attempt has been made to bring this little edition up to date. None the less the book is a bargain for the reader prepared to make the necessary marginal corrections.

The Cambridge University Press has published, in the standard form, Abstracts of Dissertations Approved for the Ph.D., M.Sc., and M.Litt. Degrees in the University of Cambridge during the Academical Year 1939–40. The summaries are arranged in the alphabetical order of the faculties. There are five biochemical dissertations, two on experimental psychology, and one on a physiological subject.

Preparations and Appliances

TECHNIQUE FOR FASTENING A CASUALTY ON AN A.R.P. STRETCHER WITH TRIANGULAR BANDAGES

Mr. H. F. HODGES, staff officer for stretcher parties, and Dr. E. B. GROGONO, medical officer for civil defence (Woodford Green), write:

By the method described below a patient can be kept on his or her side in reasonable comfort without interfering with respiration; the stretcher can be tipped, deliberately or accidentally, to any angle, and even inverted, without risk to the patient. The method may be used for lowering certain cases, either from an improvised crane or by sliding the stretcher down a ladder; and to provide additional safety and comfort for certain cases in ambulances.

The injuries for which it might be employed include complicated fracture of ribs, shattered jaw, concussion, etc. It is possible to argue that almost every unconscious patient with risks of respiratory obstruction from tongue and vomit should be placed and secured in this position for an ambulance journey, in which the attendant has very poor facilities for performing her alleged functions.

The actual bandages are so well illustrated by the diagrams of Miss E. M. Watts, our ambulance officer, that only minor comments are needed. (*a*) The two interlocking bandages on the uppermost shoulder keep the patient fixed on his side and, although fastened quite firmly, do not interfere with respiration. We have, on a stretcher, been turned to every conceivable angle, and this bandage prevented movement, took much of our weight in various positions, and was surprisingly comfortable. The fold of the blanket, i (Figs. 1 and 5), comes

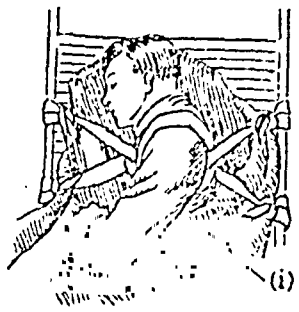


FIG. 1

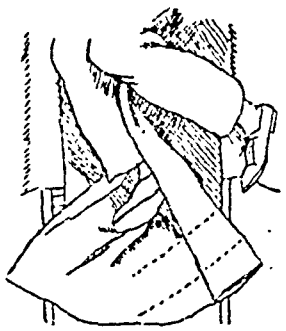


FIG. 2

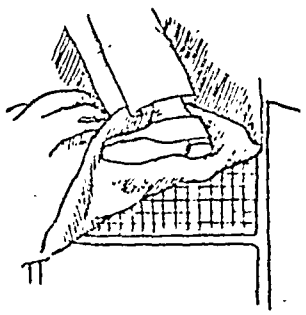


FIG. 3

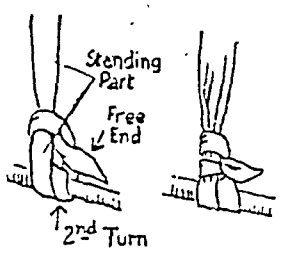


FIG. 4

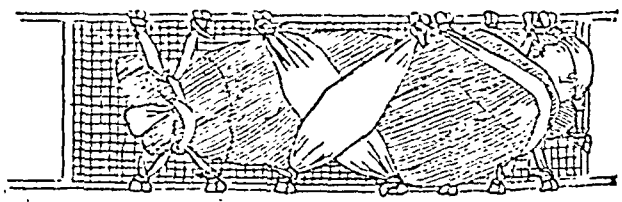


FIG. 5

up over these bandages easily to wrap the shoulder. (*b*) Careful padding between the ankles is important (Figs. 2 and 3). (*c*) The knots used are simple but extremely important. The reef, as such, is useless and dangerous. A round turn on the stretcher bar should be secured by two half-hitches of the free end about the standing part. "Two round turns and two half-hitches" (Fig. 4) are better still—even if the knot is thus brought fairly near the end of the bandage—as it also takes most of the strain off the knot itself. It is immaterial whether the two half-hitches are tied the same way—making a clove-hitch as in the diagram—or in opposite directions.

DIPHENAN B.D.H.

Diphenan B.D.H. is a preparation of *p*-benzylphenyl carbamate. This is a non-toxic anthelmintic which has established a considerable popularity under a proprietary name.

Great difficulties attend alterations in nomenclature of drugs, and Messrs. B.D.H. issued a leaflet in January, 1940, explaining their policy in cases such as this: We are glad to note that they accept the principle that "official or recognized names" should be used when these are available. We suggest, however, that their leaflet requires revision, since in the list of substances for which there is no such official or recognized name available the first two examples are anacardone and iodatol. Anacardone is nikethamide (*B.P.*, 1932, 3rd Addendum) and iodatol is stated to conform with the specification for iodized oil (*B.P.*, 1932, 1st Add.). In this matter of nomenclature the interests of the medical profession are perfectly clear. The practising doctor cannot be expected to know more than one name for a drug, and knowledge of a single name ought to be sufficient to permit him to identify a drug even when several different brands are on the market.

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CALCIUM REQUIREMENTS

Calcium is an essential constituent of the diet, and the need for it continues throughout life. This is most imperative in the period of growth and adolescence, in pregnancy and lactation, but is none the less imperative in adult life and old age. Many factors are concerned with the metabolism of the element, and knowledge of some of them is still very incomplete.[1] Vitamin D plays an important part in its absorption from the gut and deposition in the bone, and it is well to remember that calcium cannot be retained in the absence of adequate phosphate. Certain of its salts, such as oxalate, are insoluble in the intestinal juices, while the phytic acid of cereals may immobilize further quantities. Recent experiments on man and animals[2] show, however, that calcium as carbonate, gluconate, or phosphate is almost as available as the calcium of milk. Lactose and citric acid favour its absorption. Even at best calcium is probably utilized by adults and children only to the extent of some 20–30%, though the efficiency may be much higher in young infants (Mitchell[1]). On the other hand, it seems probable that at certain stages of growth, at least, children have no maintenance requirement and deposit all the calcium they manage to absorb.[3] Absorption and retention of calcium by both man and animals is definitely influenced by the degree of calcium saturation of the organism, and this may greatly affect the outcome of balance experiments. Of the ingested calcium, some passes through the gut unchanged, some is absorbed and may be retained, and some is excreted in the urine. Relatively large quantities are poured into the intestinal tract with the digestive juices, and these may be partly reabsorbed, but the remainder may serve to swell the faecal excretion. Man excretes the bulk of the calcium in the faeces. It is only exceptionally, on very low intakes or under abnormal conditions, that urinary losses predominate. As a rule the calcium content of the diet has but little effect on the blood calcium level, but the rabbit is a notable exception, and it is generally acknowledged that this animal is unsuitable for most investigations on calcium metabolism.

In recent years much work has been done on the calcium requirements of man, and several estimates have been put forward. Probably the best known is that of Sherman,[4] who sets the lowest maintenance requirement of a 70-kg. adult (male or female) at 0.45 gramme of calcium a day. This is a bare minimum, like the lowest figures for protein requirements of Chittenden and Hindhede. It is customary to add to it a margin of safety of 50%. In this country the careful work of Owen[5] gave a slightly higher maintenance value, 0.52 gramme—almost the same as that calculated by Leitch[6] from an impressive array of data. The requirements of children and of pregnant and lactating women are higher than those of adult males and unencumbered females. Thus the League of Nations' estimate[7] allows a child 1 gramme daily and the expectant or nursing mother 1.5 grammes. Lactation imposes a very heavy drain of calcium, and some workers believe that it is not possible for a freely lactating woman to remain in positive calcium balance and that she must draw on her reserves (Mitchell[1]). Figures used for the assessment of requirements of populations are therefore higher than those for adults. For the population of the United States, little differing from ours in age and sex distribution, Stiebeling[8] used the value of 0.6 gramme, or, with the 50% margin of safety, 0.9 gramme. For the whole population of England and Wales Crawford and Broadley[9] have calculated from the B.M.A. minimum diets a figure of 0.7 gramme (or 1 gramme if the more generous standard of the League of Nations is used); and Leitch's[6] estimate is 0.76 gramme.

How do results of our dietary surveys compare with these estimates? The best-known is that of Sir John Orr.[10] It shows that the poorest 10% of the population, half of whom are children under 14, get only 0.37 gramme calcium daily; a further 20%, or nine million people, again including many children, only 0.52 gramme; and the next 20% only just touch the bare minimum of 0.61 gramme. These disturbing findings are amply confirmed in other surveys—for example, the comprehensive one of Crawford and Broadley[9] or that of Potts,[11] who reported that the average daily consumption of calcium in sixty-three families in Yorkshire with four to six children was only 0.37–0.43 gramme a head. There is, in general, a marked correlation between the intake of milk and of calcium, and reports from various distressed areas show how appallingly low is the consumption of milk by the poor population.[12] Gaunt and his co-workers[13] fed to rats an exact replica of a poor human dietary (the Peterhead diet), and showed that the performance of the animals was subnormal but that it could be greatly improved by the addition of calcium and phosphorus. Here the experiments of Sherman and his pupils[14] are of interest. They studied the effects of increasing the calcium content of a diet which had supported "normal" nutrition through forty-three generations of rats. An increase from the original 0.2

[1] Mitchell. *The Dietary Requirement of Calcium and its Significance* 1939. Hermann et Cie, Paris.
Shohl. *Mineral Metabolism.* 1939. Reinhold Publishing Corporation, New York.
Logan. *Physiol. Rev.*, 1940, **20**, 522.
Schmidt and Greenberg. Ibid., 1935, **15**, 297.
[2] Pierce, Daggs, Meserve, and Simcox. *J. Nutrit.*, 1939, **17**, Proc. 21.
Steggerda and Mitchell. Ibid., 1939, **17**, 253.
Tisdall and Drake. Ibid., 1938, **16**, 613.
Henry and Kon. *Biochem. J.*, 1939, **33**, 173.
[3] Kinsman, Sheldon, Jensen, Bernds, Outhouse, and Mitchell. *J. Nutrit.*, 1939, **17**, 429.
[4] Sherman. *Chemistry of Food and Nutrition.* 1937. The Macmillan Co., New York.
[5] Owen. *Biochem. J.*, 1939, **33**, 22.
[6] Leitch. *Nutr. Abstr. Rev.* 1937, **6**, 553.
[7] League of Nations Health Organization Technical Commission on Nutrition. *Bull. Hlth. Org. L. of N.*, 1933, **7**, 453.
[8] Stiebeling. U.S. Dept. Agric., Misc. Pub., 1933, No. 143.
[9] Crawford and Broadley. *The People's Food.* 1938. Wm. Heinemann, Ltd., London.
[10] Orr. *Food, Health and Income.* 1936. Macmillan and Co., Ltd., London.
[11] Potts. *Report on a Study of the Diets of 295 Families in the West Riding of Yorkshire.* 1939. Wakefield.
[12] Harry. *Welsh J. Agric.*, 1937, **13**, 69.
Balfour. *Proc. roy. Soc. Med.*, 1938, **31**, 941.
Burns. *J. State Med.*, 1934, **42**, 157.
[13] Gaunt, Irving, and Thomson. *J. Hyg., Camb.*, 1939, **39**, 91.
[14] Sherman and Campbell. *J. Nutrit.*, 1935, **12**, 363.
Lanford and Sherman. *J. biol. Chem.*, 1938, **126**, 551.

to 0.35% of calcium by the addition to the diet of calcium carbonate was followed by a more efficient utilization of the food, better growth, earlier maturity, several indications of higher adult vitality, a longer period between the attainment of maturity and the average length of adult life. Further increases to 0.64 and 0.8% produced a higher level of nutritional well-being throughout life, and the authors concluded that "the level of calcium intake most conducive to optimal well-being is significantly higher than that required for normal growth and maintenance." Whether the same is true of man is not known, but excellent health and performance have certainly been observed on calcium intakes very much higher than those of the population of the British mainland. In the Island of Lewis, where the maternal "efficiency" is high and teeth are excellent, the daily calcium intake is 1.12 grammes per head.[15] The virile population of Finland takes 25% of its caloric intake as milk and milk products,[16] and its calcium supply must be of the same order as in the Island of Lewis. The athletes competing in the last Olympic games at Berlin took, according to Berg,[17] from 2.0 to 3.5 grammes of calcium daily.

It appears reasonably certain that the calcium intake of the population of this island as a whole is inadequate, and unless some measures are taken the position will deteriorate further owing to war conditions. Cheese is now, and is likely to be, in short supply. There was a temporary shortage of liquid milk last winter, and, though the dairy cow has been given precedence over all other stock in matters of rationing, it is impossible to predict how much foodstuff will be available and to forecast the position next winter. Similarly, imports of dry and condensed milk may be curtailed by other demands on shipping, though every effort should be made to bring to this country and sell cheaply the largest possible quantities of this most important protective food. The increasing home production of green vegetables should help to improve the calcium supply, but greens get short towards the end of winter. The force of circumstance lends support to the Government's decision to fortify bread with calcium. This measure is nutritionally sound, should help to increase the supply for those who need it most, and has much to commend it as an emergency step in wartime, provided it is not misused as a political placebo. There should be no need for such an expedient in peacetime, and we are entitled to hope that post-war reconstruction will put an end to the evil of malnutrition and bring a healthy and complete diet within the reach of all. The idea of adding calcium salts to the diet is not new, and has been carried out with good results in India by Aykroyd,[18] and has also been sponsored recently by Mitchell.[1] The amount and the nature of the calcium salt to be added to bread are still not settled. The decision rests presumably on the outcome of experiments at present in progress, and the results will certainly be awaited with interest.

The situation regarding calcium requirements and metabolism, as summed up here, is sharply at variance with views put forward in an article which appeared recently in this *Journal*.[19] Dr. R. A. McCance and Miss Isabella Leitch, both eminent students of mineral metabolism, explain in our present issue (pp. 276, 291) why the evidence presented in that paper is likely to carry but little weight. Their evidence is also supported by Dr. J. Douglas Robertson (p. 292). No more need be said here than that it was fitting that a statement of experimental results and an opinion on them, however unorthodox, should have been given the freedom of publication, and that it was no less fitting that this should be put in its proper scientific perspective. Seen thus, against the background of accumulated experience, the utterance of Harris and his colleagues is not likely to affect or alter our present views on the calcium requirements of man or on the deficiency of this element in the present British diet.

[15] King. Med. Res. Cncl. Sp. Rep. Ser., 1940, No. 241.
Cathcart, Murray, and Beveridge. Ibid., 1940, No. 242.
[16] Virtanen. *Cattle Fodder and Human Nutrition*. 1938. University Press, Cambridge.
[17] Berg. *Ernahrung*, 1937, 2, 255.
[18] *Lancet*, 1938, 2, 153.
Indian J. med. Res., 1939, 27, 409.

CHEMOPROPHYLAXIS OF GAS GANGRENE

We suggested only three weeks ago[20] that the experimental method had gone far enough in studying the treatment of gas gangrene, and that the need of the moment is for data obtained in the clinical field. Of treatment this remains true, but the results described by Dr. Frank Hawking in our present issue (p. 263) show that something of importance remained to be discovered about how to prevent infection of this kind. They are not the first, but perhaps they are the most striking illustration hitherto of what may be achieved by the timely local application of sulphonamide compounds. This is a form of chemotherapy—it should rather be termed chemoprophylaxis—which has been almost entirely neglected until recent times, for reasons which are not far to seek. Until it became known how these compounds act on bacteria there was little reason for supposing that they would have a local action; indeed, Continental authorities maintained views about their mode of action with which the idea of any local and direct effect on bacteria was incompatible. Domagk himself, and other German writers, have consistently denied that there is any direct effect on bacteria of a kind demonstrable *in vitro*; in their view the co-operation of the living body as a whole is necessary, and they seem almost to regard "true chemotherapy" as involving some mystery which can never finally be probed. Levaditi and other French workers have produced, among other ingenious red herrings, the idea that sulphanilamide is converted in the tissues into a different and more active compound, and described experiments in which introduction of the drug by some distant route was more effective than its injection directly into the peritoneal cavity, which was the site of infection. In the atmosphere created by repeated proclamations of this kind there was no encouragement to employ or even to think of sulphanilamide as a local antiseptic. Some enterprising clinicians had either escaped from or were unaware of this mephitic atmosphere, and applied sulphanilamide locally with good results before the work of Fildes and Woods[21] finally gave both systemic and local sulphonamide chemotherapy a completely rational basis. We now know that sulphonamide compounds act directly

[19] Harris, Ireland, and James. *British Medical Journal*, 1941, 1, 49.
[20] *British Medical Journal*, February 1, p. 166.
[21] *Brit. J. exp. Path.*, 1940, 21, 67, 74.

on bacteria by arresting a particular process in their metabolism; wherever these compounds exist in adequate concentration—what is adequate depending on available nutriment—the growth of susceptible bacteria must stop. Local application is therefore reasonable; whether it succeeds may depend on various local conditions and can best be decided by practical trial.

Hawking used the method devised by Legroux: muscles are exposed and crushed, the drug is then introduced in powder form, and a piece of material soaked in culture is placed in the wound, which is then sutured. In animals surviving three days the wound was reopened, the material removed, and more drug applied. In these experiments the large inoculum of bacteria so applied to damaged tissue produced an infection which was almost invariably fatal within twenty-four hours in untreated controls. Among the treated not only was life much prolonged but there were many survivors. In view of the enormous inoculum used, these results appear more striking than any previously obtained with systemic treatment, and a comparison of the two methods in these experiments decidedly favours local application, although it may be questioned whether intraperitoneal sulphathiazole gives the systemic its best chance. It is interesting that this experiment reverses the routes employed by Levaditi and Vaisman[22] in an experiment already quoted, and leads to exactly the opposite conclusion. The details of these results demand careful study, complicated as they are by the use of three drugs and three species of bacteria. Against infection by *Cl. welchii* sulphathiazole is the most effective, with sulphanilamide running it close; a mixture of the two was tried in a smaller number of animals and may perhaps be better than either. Sulphapyridine, on the other hand, is decidedly inferior to either. The order of merit is the same against *Cl. oedematiens*, but *Cl. septique*, although well controlled by sulphathiazole, is almost entirely uninfluenced by sulphanilamide. These differences are due only in part to degrees of specific activity: a study of the fate of each drug in the tissues showed, as would be expected from their differing solubility, that sulphanilamide attained a high concentration but disappeared rapidly; sulphapyridine persisted for ten days, but never attained a concentration of 50 mg. per 100 c.cm. at all; whereas sulphathiazole, having evidently an optimum degree of solubility for this purpose, persisted for four days in a concentration of over 100 mg. per 100 c.cm. Trials were also made of some other sulphonamide compounds, and of proflavine, which also proved capable of arresting the spread of infection. In future studies of this kind, whether experimental or clinical, acridine compounds still have a claim to consideration.

In interpreting these very favourable results it must be remembered that the drug was introduced before the bacteria. They are examples of pure prophylaxis; when treatment was delayed for two hours its efficacy was greatly reduced, and six hours' delay robbed it of all effect. By this time bacteria had doubtless invaded the muscle deeply and thus escaped from the area in which a high concentration of the drug is attained. It may be asked in view of this why local treatment with sulphanilamide has the effect with which it has recently been credited on wound infections which have existed for days or weeks. The probable answer is that in persistent suppuration most of the bacteria are in the fluid contents of the wound and only superficially situated in surrounding tissue, and therefore more accessible than in an acute and spreading infection. However these experiments may be interpreted, they place the chemoprophylaxis of gas gangrene on a footing which it previously lacked. To obtain clinical confirmation, as Hawking points out, will demand the comparison of this with other methods in a very large number of cases, and it may be long before results have accumulated on an adequate scale. To those not in a position to conduct such a study the sulphonamide pack may forthwith be commended as a promising method of immediate wound treatment.

[22] *C. r. Soc. Biol.*, Paris, 1938, 128, 476.

INFLUENZA

As everyone knows, influenza is now abroad. For obvious reasons, epidemiological events have been awaited this winter with particular gravity. The enigmatic character of influenza accentuates the mood, because, whatever the logician may say, the coincidence of the last great war and the most deadly pandemic of influenza in recorded history affects the imagination, and, to our profession at least, the grimness rather than the gaiety of urban life has been impressive these past six months. It is too early yet to be sure that the present epidemic will not be an important cause of mortality, but not too soon to permit one to believe that a major epidemiological disaster is unlikely. In the first place, the age distribution of deaths ascribed to influenza has shown no tendency to pass from the normal type in which a large proportion of the victims are over 65 years of age, to the pandemic type in which those of younger age formed a larger proportion. A sudden change of age distribution was a dramatic feature of the great pandemic. In the next place, although the weekly totals of deaths in the 126 great towns were still increasing in the first week of February (the figures were, for four weeks ending with that mentioned, 99, 120, 176, and 261), and may be expected to increase further, the increase between the last two weeks is much less than in 1929—a bad year in which the first three weeks of the epidemic had figures almost identical with those of this year (99, 122, 179). The following figure was 321, and in that year the epidemic was well under way earlier in the season. Available figures of both hospital admissions and deaths in the London area suggest that the maximum of illness may already be behind us, and the maximum of deaths very near and much lower than that of 1929, even when allowance is made for evacuation.

No prudent man dogmatizes about influenza: it is not even true that when the spring flowers are in bloom all danger is over until autumn. Apart from the great pandemic, there have been severe epidemics in late spring and early summer, but none since 1918. In last year's epidemic deaths numbered 94 (in the great towns) in the first week of the year and 417 in the fourth week; there was then a decline to 353, followed by a sharp increase to 514; and the actual maximum, 629, was in the eighth week. In 1938–9 the first rise was a week earlier, from 89 in the week ending December 31, 1938, to 144 in the following week; as in the following year, there was decline and a secondary elevation—indeed two secondary elevations—but in the worst week there were only 285 deaths. We may go no further than to suggest that on the available evidence it seems unlikely that we shall suffer more this winter than last. Having regard to the

many good reasons for believing that opportunities for disseminating droplet infections are greater now than a year ago, this is a pleasant inference. It does not authorize the least relaxation of our endeavours to disperse the population.

THE SPINAL VEINS AND METASTASES

Recent work on the spinal veins suggests a possible explanation of certain modes of spread of malignant disease. By injection experiments Batson[1] has been able to show that there is a free passage by way of the spinal veins from the pelvic veins up to the cranium, and without recourse to the inferior vena cava. In human cadavers the dorsal vein of the penis was injected with diluted vermilion (Weber's artists' water colours), which could be easily seen, and which, from its crude sulphide of mercury, was also radio-opaque. The injection material spread through the prostatic venous plexus, the sacral and lumbar spinal veins. Thence, without entering the inferior vena cava, the injection material progressed in some experiments up the spinal canal to the base of the skull. Many intercostal veins were filled, as well as the veins of the bony pelvis. The experiments were repeated on living *Macacus rhesus* with colloidal thorium dioxide. *X*-ray examination showed that the injection material passed from the deep dorsal vein of the penis into the pelvis, and ascended the trunk by means of the inferior vena cava; but when the monkey's abdomen was compressed some of the thorotrast passed into the spinal veins and could be followed along them past the zone of compression into the thoracic spinal and lower intercostal veins. These experiments confirm the oft-repeated observation that spinal pressure is raised by abdominal compression. In coughing, straining, and other procedures that raise intra-abdominal pressure blood may be squeezed out of the abdominal veins into the spinal veins. It is well known that malignant tumours may spread by metastasis from the prostate and other pelvic and abdominal organs to the spine and cranium without any evidence, in the form of pulmonary metastases, that they have passed through the caval system and the lungs. Batson's observations provide an anatomical explanation of this phenomenon. In explanation of certain aberrant metastases from breast carcinoma Batson records that material injected into a breast vein of adult female cadavers may spread to the clavicle, intercostal veins, the head of the humerus, the cervical vertebrae, the transverse and superior longitudinal cranial venous sinuses, as well as to the azygos vein and the superior caval system. In some of these experiments the skin around the site of injection becomes flushed with vermilion, and the flush gradually extends past the middle line, even to the skin of the other breast. On the basis of this spread of injected material in the subpapillary venous plexus of the skin, Batson suggests that Handley's lymphatic permeation theory might be again studied with profit. It appears that there is a vast intercommunicating system of veins of which the spinal veins are the main channels. These veins for the most part lack effective valves, and are the site of frequent reversals of flow. They are thin-walled vessels and may be difficult to identify when empty of blood, but at operation may be of alarming size. They are a storage lake as well as a pathway of drainage. They provide a ready vehicle for neoplastic (and pyogenic) metastases. Batson suggests that these veins should be called the vertebral veins, and that they are of sufficient importance to be regarded, along with the caval, pulmonary, and portal systems, as one of the important venous systems of the body.

[1] *Ann. Surg.*, 1940, **112**, 138.

COMPARATIVE PSYCHOLOGY

We have been warned often enough that to argue from mice to men is full of fallacies, and nowhere more than in that domain where the superior organization of man is most definite—namely, the mental. Perhaps it is this caution that has deterred workers in this country from experiment in animal psychology. Whatever the reason, we have to go abroad, and especially to the U.S.A., for experimental studies in animal "psychology," which have flourished there under the stimulus of the pre-eminently American psychological system, Watson's behaviourism. Another approach to animal psychology, that of Pavlov, has been increasingly employed in a number of centres in the U.S.A. also, while it is doubtful whether a single laboratory has existed here for this purpose. Comparative psychology in this country has been practically confined to the observational method, employed, for example, on animals at a zoo. Let us hope that the war may give us as a people a greater interest in the uses of science as a means of social amelioration rather than of destruction; and that some of the increased wealth that Mr. Keynes paradoxically promises us after the war may be devoted even to such remote and apparently academic studies as experimental animal psychology.

These reflections are prompted by a contemplation of the *Journal of Comparative Psychology*, and of the copiousness of the output in this field in the U.S.A. Not that such studies always repay the labour spent on them. The experiment may amount to nothing more than a demonstration that what happens in humans has its parallel, or at any rate its analogue, in animals. For example, two papers on "regression" by L. I. O'Kelly[1] show that under the influence of pain an animal may revert to a mode of behaviour previously learned, although less effective for the task in hand than a method more newly acquired. This is consoling to those who have been a little disturbed by the readiness with which the concept of "regression" has been dragged in, among psychologists, to describe certain modes of behaviour which, while not "adult," were not such as ever had been seen on land or sea. But the fact that dissolution of habit does not always follow evolution probably depends partly on the complicated foundations of the structure of human habit. It is therefore comforting to find that a regressive piece of behaviour in the literal sense can be demonstrated experimentally. When all has been said, however, there is to the clinician an air of unreality about experimental work of this kind, perhaps because it is nearer the physiological than the psychological level. The affective side is absent, and the complicated business of social relationships, of which human behaviour in all but its simplest form is essentially a part, has usually to be left out. Nowhere does this strike the observer more forcibly than in Pavlovian experiments on the production of "neurosis" in dogs. But even here there is a satisfaction in demonstrating that pathological signs of behaviour can arise, not from lesions, but from a conflict of impulses in the cerebrum. The piece of work that has prompted these remarks suffers, alas! from other defects than this—defects primarily of simple failure of analysis. The fact that an animal which has learned two ways of getting at food drops one of these when it finds the method painful, and reverts to the previously learned one, seems not to be regression in the sense of regression as known in human psychopathology, but surprisingly sensible—not in the common sense, but in Starling's sense of the "wisdom of the body." The animal chooses not so much a regressive as a different path.

[1] *J. comp. Psychol.*, 1940, **30**, 41.

ZINC PEROXIDE FOR WAR WOUNDS

We drew attention last year[1] to the use of zinc peroxide as an application to certain types of infected wound. The originator and most persistent advocate of this treatment is Meleney, who first adopted it for a characteristic slowly spreading gangrene of the skin, of which he gave the first full clinical description. The infection in these cases, which usually develops in connexion with an operation wound of the chest or abdomen, is due to a microaerophilic streptococcus, and zinc peroxide is said to restrain the growth of this organism by continuously liberating oxygen. Later Meleney advocated the same treatment for infection by other streptococci and by anaerobic bacteria generally; indeed, the only common wound invaders said to be exempt from its action are staphylococci and coliform bacilli. Treatment with zinc peroxide is also strongly recommended by B. S. Freeman[2] for necrosing cancers and ulcers following irradiation of malignant growths. In many of his thirty-five cases the region involved was the mouth, and bacteriological study revealed mixed infections in which streptococci and anaerobic Gram-negative bacilli (*F. fusiformis* "*B. necrophorus*") predominated. Such bacteria disappeared in consequence of the treatment, anaerobes being the first to go; the clinical effects were rapid abolition of fetor and diminution of pain, contributing greatly to the patient's comfort. The technique of application is evidently important. Zinc peroxide powder is sterilized by dry heat and made into a thick paste with sterile distilled water; every crevice in the wound is then filled with this paste by a syringe or tube. Refilling is necessary several times a day for a lesion within the mouth, but an external wound can be dressed and left untouched for as long as two days; the dressings, which are additional to filling of the cavity with paste, are gauze soaked in the paste and several layers of gauze permeated with vaseline to prevent evaporation. The steps taken to ensure persistent contact between the antiseptic and every part of the infected surface probably have much to do with the success of this treatment. When other antiseptics are used it is often thought to be enough to apply a wet dressing which merely rests on the more superficial parts of the wound, leaving other parts untouched; whereas spraying, irrigation, or the method here advocated for zinc peroxide, can alone secure thorough and universal contact. A drawback to the use of zinc peroxide is the variable activity of different samples. The only make found by Meleney to be consistently active is not pure zinc peroxide, but a mixture of four different zinc salts, which suggests that oxygen liberation is not the whole explanation of its effect; the zinc ion itself may take part. If therapeutically active zinc peroxide is now available in this country, there may well be a field for its use in the treatment of some types of infection in war wounds.

INFERTILITY IN THE MALE

Considerable progress has been made during the last decade in the investigation of the infertile male. This divides itself naturally into two parts: the clinical examination and the semen analysis. Later, when the results of these two examinations are correlated, each will be found to throw light on the other—the medical history and the clinical examination explaining the semen findings, and the semen analysis suggesting the need for further investigation in order to discover the cause of any anomalies or deficiencies that may have been found to be present. A comparatively recent additional method of examination is by testicular biopsy. In 1913 Huhner advocated testicular aspiration as a diagnostic measure in cases of azoospermia. Although useful, aspiration of the testes provides far less reliable and complete knowledge than does biopsy, which has now completely superseded it. In the *Journal of the American Medical Association* of October 26, 1940, Dr. C. W. Charny gives an interesting paper on this subject. The technique of testicular biopsy is simple and can be performed in the consulting-room if measures for a strict aseptic technique are available. The whole operation can be carried out under local anaesthesia, although some pain may be felt on incising the tunica albuginea. This incision should be just enough to allow of a small bead of testicular tissue being extruded. This is cut off with curved iridectomy scissors, and submitted to microscopical examination. It is not generally necessary to suture the incision, but only the wound in the scrotal wall. Testicular biopsy gives direct evidence of the condition of the tubules. It allows, therefore, of differentiation between azoospermia due to blockage in the genital tract and to failure of spermatogenesis. What is equally valuable is the information that it provides concerning the results of treatment and for prognosis. When performed before and after treatment it yields the most direct evidence of the efficiency of the therapeutic agent employed. Since treatment has not made the progress that has been made in diagnosis, it is necessary to have some means of gauging the efficiency of the various therapeutic agents that are being tried.

In the same number of the journal appear articles on the diagnosis and treatment of male sterility and on the nature of human infertility, by A. R. Kreutzmann, S. R. Meaker, and S. N. Vose. The first-named author divides sterility in the male into two categories: urological and endocrinological. The disability may be either congenital or acquired. In the urological group the commonest cause of infertility is a blockage in the genital tract—usually in the epididymal canal—due to a previous attack of gonorrhoea. In the endocrine group the commonest cause is hypoplasia of the testes, due probably to a pituitary deficiency. Many of the latter cases prove difficult to explain, since outwardly the patients appear to be normal healthy men, and we have no laboratory tests by means of which we can diagnose minor degrees of pituitary dysfunction. Treatment of these cases is very difficult. Indeed, it must be confessed that the only satisfactory results obtained from endocrine therapy are those in which the infertility is due to hypothyroidism. Kreutzmann has obtained no satisfactory results from the use of testosterone propionate. Like other workers, he lays emphasis on the quality of the spermatozoa found in the semen rather than on their number. At one time it was believed that if the spermatozoon count was below sixty million per cubic centimetre of semen the man could, for all practical purposes, be considered sterile. It is now known that conception has followed from impregnation with semen with no more than three million per cubic centimetre. All investigators, however, confirm Moench's view that the number of abnormal spermatozoa should not exceed 25%.

We regret to announce the death of Emeritus Professor William Bulloch, M.D., F.R.S., consulting bacteriologist to the London Hospital.

The Red Cross and St. John Fund for the Sick and Wounded in the War now stands at £4,356,000.

[1] *British Medical Journal*, 1940, 1, 398.
[2] *J. Amer. med. Ass.*, 1940, 115, 181.

CHARLES WHITE, AND THE GROWTH OF PROVINCIAL MEDICAL EDUCATION

PROF. BURGESS'S HUNTERIAN ORATION

The Hunterian Oration was delivered by Prof. A. H. BURGESS of Manchester before the Royal College of Surgeons of England, meeting at the house of the Royal Society of Medicine on February 13. Sir Hugh Lett presided.

Prof. Burgess mentioned that this was the eighty-first oration, and he was the first orator to be entirely a provincial surgeon—that is, one who had not received his medical education in London and who had not practised in London at any time. In the first part of his oration he spoke of his distinguished fellow citizen Charles White, F.R.S., who was born in 1728, the same year as John Hunter, whose fellow student and lifelong friend he was. White was also the founder of the Manchester Royal Infirmary and a pioneer in the prevention and treatment of puerperal fever. After thirty-eight years' service on the staff of the infirmary, White resigned owing to a disagreement with the board, and in the same year he founded the Manchester Lying-in Charity, the precursor of the present St. Mary's Hospitals for Women and Children, and for twenty-one years served on its staff under the singular title of "man-midwife extraordinary." In 1803 a severe attack of ophthalmia destroyed the sight of his left eye, but he continued to practise and even to operate until 1812, when a similar attack left him totally blind, and he died in 1813.

White's chief literary production was his treatise *On the Management of Pregnant and Lying-in Women*, first published in 1773, and dedicated to John Hunter, a treatise which embodied twenty-seven years of midwifery practice. His description of the lying-in conditions of those days, especially of how the unfortunate woman was almost hermetically sealed against any breath of fresh air, was a graphic piece of writing. One respect in which White was a pioneer was postural drainage. The credit for what was known as Fowler's position should really go to him. He also marvellously anticipated the essentials of sepsis and its prevention. He claimed indeed that of the large number of lying-in women whom he had attended he had not lost one from puerperal fever, though he qualified this statement later by making it referable to such cases as he had himself delivered throughout. A quarter of a century after White's death there was a serious fall from grace in the hygiene of childbirth, largely due to French teaching; the methods of White and his followers were abandoned and puerperal fever again became rife even in Manchester Lying-in Hospital, which White himself had founded.

A Pioneer in Prevention of Puerperal Fever

The claim so persistently made by Continental writers that the knowledge of the prevention and cure of puerperal fever originated with Semmelweiss in Vienna in the middle of the nineteenth century ignored the patient labours of White and of British obstetricians. Prof. Burgess showed how by successive stages spread over several years Semmelweiss arrived at the identical views and practice advocated by White eighty years earlier. The only point not specifically mentioned by White but stressed by Semmelweiss was the fatal part played by the examining finger stained with cadaveric material when students went straight from the dissection room to the lying-in case, but as Manchester at that time had no medical school the explanation of the omission was obvious. All honour to Semmelweiss for his courageous advocacy, in the face of strong opposition, of measures to diminish the appalling risks of childbirth, but they represented merely the reapplication of principles enunciated by White.

White was a most original general surgeon, and read many papers on surgical topics to the Royal Society. In 1762 he published a volume on the use of the sponge in stopping haemorrhage. He used dried sponge largely as a dressing, and seemed to have anticipated by over a century and a half the principle of the modern Winnett Orr treatment of acute osteomyelitis. Stone in the bladder was common in Yorkshire in White's time, and many cases were admitted to Manchester Royal Infirmary, where White soon acquired a reputation as a lithotomist. He was also a naturalist and was styled the father of anthropometry, which was true so far as the living subject was concerned. He was the first to discover that the forearm of the European was shorter as compared with the upper arm than the forearm of the negro, and that the negro forearm was shorter in comparison than that of the ape.

Beginnings of Provincial Medical Schools

The first course of medical lectures in the Provinces was delivered in 1783 at the house of the Manchester Literary and Philosophical Society by Charles White and his son Thomas, and four years later these two at their house in King Street started the first provincial classes, confined to medical students, with lectures in anatomy and physiology. Down to the early part of the nineteenth century anyone from the Provinces desiring to obtain a qualification was obliged to attend hospital practice in London before being allowed to sit for the licentiateship of the Society of Apothecaries or the membership of the Royal College of Surgeons. In 1814 Joseph Jordan, the father of provincial medical education, started a school of anatomy in Manchester, and in 1817 his lectures were recognized by the Society of Apothecaries, the first recognition of provincial medical instruction by any licensing authority in this country. In those days it was difficult to obtain bodies for dissection, and Jordan had to rely on "resurrectionists," which led to an infuriated mob assaulting his premises. A select committee on the subject was appointed by the House of Commons, and upon its report was founded the Anatomy Act of 1832, permitting the unclaimed bodies of persons dying in workhouses to be used for dissection. Jordan's school was closed in 1834, and its students transferred to a school founded by Thomas Turner, the first complete school of medicine to be established in the Provinces, later to be incorporated with Owen's College, the first constituent college of the newly created Victoria University. The power to confer medical and surgical degrees was not granted, however, until three years later, and then only in the face of the fiercest opposition from the Royal College of Surgeons and generally from the London medical schools.

Between 1824 and 1834 the medical schools of Manchester, Birmingham, Sheffield, Leeds, Bristol, Newcastle-upon-Tyne, and Liverpool were founded, also those of York and Hull, which were closed respectively in 1859 and 1870. The orator briefly sketched the famous controversy of one hundred years ago, in which Thomas Wakley of the *Lancet* took such a prominent part, in the fight for the recognition of the provincial medical schools. Looking back on that controversy, he said, one was left with the impression that the members of the Council of the Royal College of Surgeons at that period displayed an undue regard to self-interest and a narrowness of vision, happily quite foreign to the Council of these days, when the claims of the London and provincial schools were considered equitably and impartially and the representatives of each met in the utmost good fellowship. That the earliest provincial students were at any rate not in the rear of their London counterparts was suggested by some early pass-lists which Prof. Burgess showed.

Hunter and Lister

Although his oration was on the provincial surgeon, Prof. Burgess concluded with a tribute to the two greatest British surgeons, both of whom must be accounted metropolitan:

"John Hunter's indisputable right to fame immortal rests upon many factors, among them his unique knowledge of anatomy, both human and comparative, his persistent advocacy that structure is but the ultimate expression of function, his emphatic insistence upon the experimental method of investigation, and, as a crowning glory, the foundation of our superb Hunterian Museum, second to none elsewhere. No such mani-

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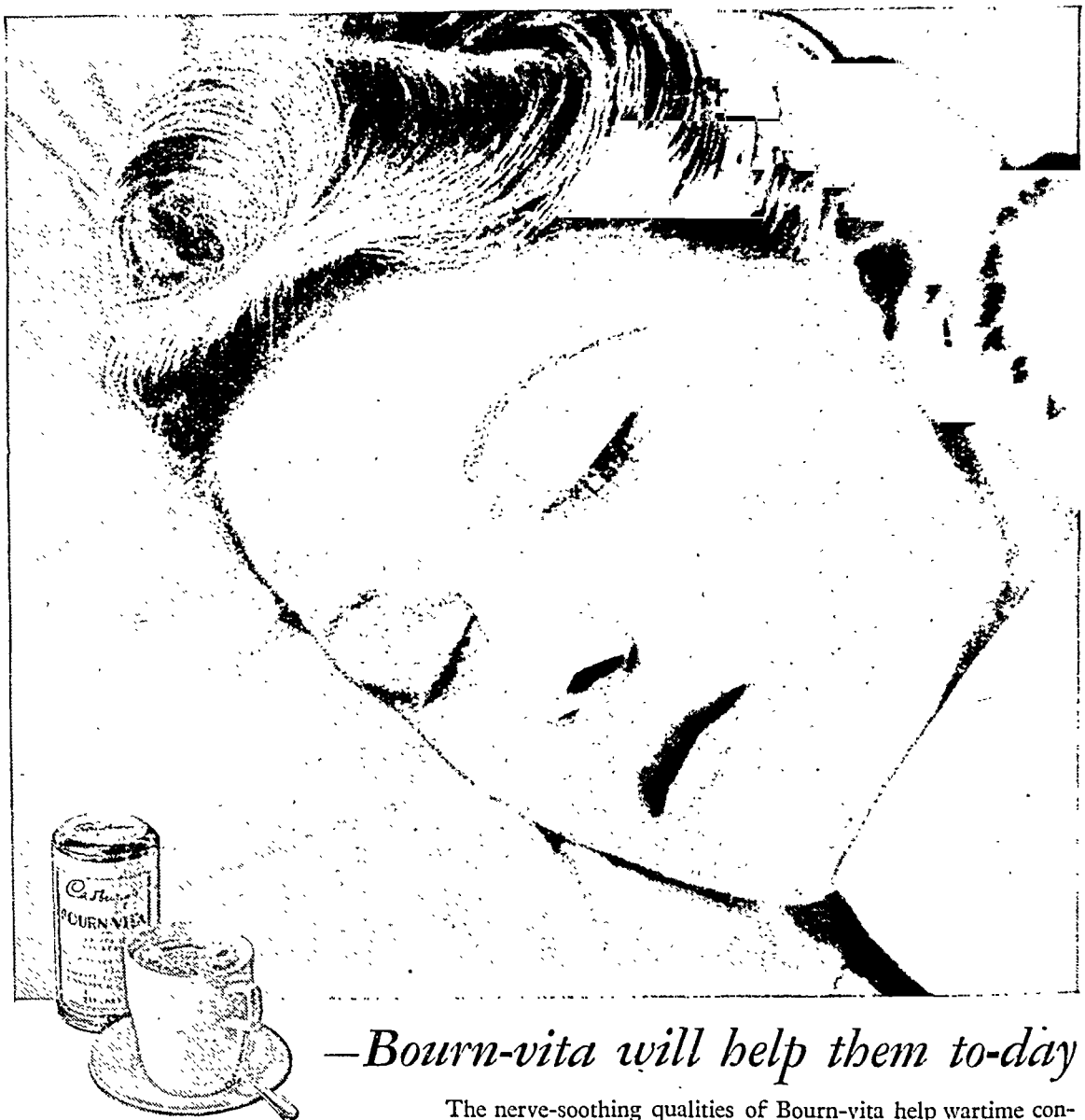
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SHELTER PROGRESS

LONDON REGIONAL COMMISSIONER'S PROGRAMME

At the Tavistock Clinic on February 15 Alderman Charles Key, M.P., Regional Commissioner for London with special charge of the shelter problem, gave an address on that subject, taking the place of Miss Ellen Wilkinson, who had been announced to speak. Dr. Edward G. Glover was in the chair.

Alderman KEY said that the first problem which had to be dealt with was overcrowding. This had been tackled by the provision of new shelters. By the end of January the public shelters and the domestic shelters provided by the local authorities were sufficient to accommodate 80% of the population of the regional area, which was roughly coterminous with the metropolitan police area, or 92% of the (smaller) London County Council area; but, of course, they were not geographically distributed in such a way as to make them evenly available to the people. According to a census taken at the beginning of January, in the public shelters in the Council area, where there was provision for 19% of the people, only 4% were taking advantage of it, and in the domestic shelters, where there was provision for 74% of the people, only 14%.

Medical Arrangements

Eighteen local authorities in the London area had already appointed an additional medical officer of health for shelter work only. In four cases a resident shelter doctor had been appointed; in other cases whole-time doctors were appointed to be responsible for more than one shelter. On nightly visits to shelters 270 doctors were employed, and about the same number were on call. In practically all the 154 large shelters —that is, shelters accommodating 500 or over—medical aid posts had been installed, including sick bay, isolation bunks, and the necessary provisions. Of the eighty Tube stations seventy-four had been fitted with aid posts. Masks to the number of 200,000 to counter droplet infection were available, half of which had been distributed to the aid posts, the other half being held in reserve in case of an epidemic. An advisory committee of medical officers of health had been set up, and held regular meetings at which medical officers from different parts of the region attended and discussed their problems. Another small committee of medical officers and bacteriologists had been appointed to assist in dealing with shelter diseases; this committee had been fortunate enough to secure the co-operation of Dr. Gordon of Harvard University. A staff of about fifteen medical officers, transferred from their ordinary work at the Ministry of Health or other Government Department, were engaged in interviewing local medical officers and in seeing that the shelters were up to standard. Finally, he reported from the medical expert concerned that while a limited number of individuals using the shelters were known to be lousy, no evidence had yet been forthcoming to indicate any increase in the louse population.

With regard to welfare work, Alderman Key desired to see in each local government area in the metropolis, or outside of it if the shelter population in the large public shelters exceeded 10,000, a welfare officer appointed to organize and control the activities of the multitude of voluntary bodies which made their way into the shelters. While he did not want to discourage voluntary organization, there was a danger that some shelters were receiving "a surfeit of social solicitude," while others were starved in this respect. On the subject of feeding, he mentioned that Lord Woolton had agreed to give up his control of canteen arrangements and to pass it over to the Regional Commissioner. Bunks had been installed for 420,000 people, and were still being put in at the rate of 60,000 to 70,000 a week. Within a few days every one of the eighty Tube stations would have its complement. Closet accommodation had been provided in the proportion of about one to every twenty-five persons. Wherever possible the authorities were encouraged to change over to water-borne sanitation, but in the Tubes this was impossible. All the Tube stations being below sewer level, compressed-air ejection plants had been or would be installed. He was giving active encouragement to experiments in electrical heating, particularly convector heating, and he had induced the Treasury to sanction expenditure for that purpose.

Good General Health of Shelterers

Dr. R. P. GARROW, medical officer of health for Hornsey, who opened the discussion, said that in one Tube station in his borough the maximum capacity was 1,500 sleeping places, and in September it held 2,000 people nightly, but the regular night population was now only 600 or 700, so that the problem of overcrowding was settling itself. The predicted shelter diseases had been absent, and he had had only one case of a supposedly verminous person reported to him, and even that person turned out on investigation not to be verminous. A medical officer with oversight of four large shelters in the City of London said that the health of the people in the shelters was better than it would have been in their own homes. A fault of the medical aid posts was the absence of sleeping accommodation for the staff who were there all night. One speaker from Kensington said that at the five Tube stations in that borough cases of infectious disease had been discovered, but they had been removed, the premises disinfected, alternative shelter accommodation found for contacts, and there had been no spread. A Hampstead medical officer urged the appointment of more shelter marshals, who had a better opportunity of detecting physical or psychological disorders than the medical officer on a cursory inspection.

Alderman KEY said that people had an idea that Tube stations were the safest, yet the two greatest disasters so far had been at Tube stations. At certain of these stations a well-directed bomb might mean that the shelterers were drowned in London sewage. Safety lay not in concentration in large underground shelters but in dispersal in small ones. The Anderson shelter had proved surprisingly efficient. A disadvantage was the noise, but this would be minimized in a new pattern with a special reinforcement. With regard to welfare, he thought there was danger in too many entertainments and canteens, because the large shelters would be made over-attractive, and thus create a problem of public health. He was asked by a member of the audience where were the bad shelters, and declared that there were now no bad ones, though some were not good. The standard of shelter now provided was far better than was the case four or five months ago.

IN THE PROVINCES

Lord Horder, who has now toured Merseyside, Manchester, Liverpool, Bristol, Birmingham, and Coventry, has stated that the best shelter policy, judged by health and safety standards, is dispersal of the population, which can best be achieved by providing domestic shelters. The provision of such shelters, which is Birmingham's policy, is held up by shortage of labour.

G. Williot (*Thèse de Paris*, 1940, No. 342), who records eighteen cases in adults aged from 22 to 68, one of which is original, states that after a sudden or progressive onset ileo-ileal intussusception proceeds with more or less violent paroxysms until there is complete intestinal obstruction. Pain is the most important sign owing to its constancy and intensity. Its principal character is the occurrence of more or less frequent crises, which may be separated from one another by painless intervals ranging from several hours to several months. The attacks of pain are very often accompanied by digestive disturbance, such as vomiting, alternating diarrhoea and constipation, and melaena. Intestinal splashing, which is an important sign of obstruction of the small intestine, will be often found during an acute attack and is an indication for operation. The presence of an abdominal swelling in the hypogastrium or round the umbilicus is of great diagnostic assistance, but is unfortunately not constant.

Reports of Societies

CHEMOTHERAPY AND WOUND INFECTION

At the meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine on February 11, a discussion took place on "Chemotherapy and Wound Infection." Sir WILLIAM WILLCOX, who presided, said that when nearly six years ago Domagk discovered dyes which inhibited or prevented the development of streptococcal septicaemia—a discovery followed by the work of Colebrook, Buttle, O'Meara, and many others—it was one of the greatest events in the history of medical chemistry, ranking with the discovery of salvarsan in 1909. These new drugs acted in collaboration with the body forces to control infection, having in reality—to use a word very much in vogue thirty years ago—an opsonic action. He urged the need for systematic observation of small groups of cases and for close collaboration with the laboratory.

New Antiseptics for Old

Colonel LEONARD COLEBROOK said that one aspect of wound pathology upon which stress was laid by Sir Almroth Wright in the last war was that every wound produced in the tissues was a honeycomb of dead spaces—spaces between muscle bundles and in the subcutaneous tissue—which inevitably became filled with serous fluid, an extremely good culture medium for certain pathogens, the commonest of which were staphylococci and streptococci. However carefully the surgeons sewed up and bandaged a wound it was often impossible completely to obliterate all dead spaces, and in such spaces there was opportunity for organisms to multiply until they overcame the leucocytes. Until recently there was no means of changing that congenial culture medium into an uncongenial one; the old antiseptics were mostly "quenched," to use Wright's term, and there was nothing which would remain for any considerable number of hours in the wound and be active in its bactericidal properties. But the coming of the sulphonamides had changed the picture. If haemolytic streptococci were planted in the dead spaces sulphanilamide would frequently kill them off completely, even without the co-operation of the leucocytes, which was not essential to the action of sulphanilamide. With staphylococci the position was less certain; it could only be ascertained by clinical control combined with bacteriological observation. By the early application of one of these compounds a large number of cases of gas gangrene, though probably not all, might be prevented. It might be hoped to prolong the safe period for surgical intervention—for complete surgical débridement. He referred in this connexion to the work of Tréfouël and Nitti of the Pasteur Institute, who had been quick to appreciate at the beginning of the war that owing to aerial bombardment there might be a great hold-up in the evacuation of wounded, and sought for some means of staying bacterial growth so that the surgeon could perform his operation later on. Experimenting with animals infected with *Cl. welchii*, they had been able to save a large number by local chemotherapy combined only with surgery to the extent of removing a foreign body whereby the infection was conveyed.

Local chemotherapy might also do much to remedy the present unsatisfactory position with regard to burns. A large number even of the less severe and extensive burns went septic sooner or later, and the sepsis increased the amount of tissue damage and delayed healing. The best hope of avoiding infection in burns was by using one of these compounds—he did not know at the moment whether it was best to employ it in the form of powder or in one of the pastes now being prepared. It might even be that ultimately sulphanilamide would not prove the best agent, but that some other substance like penicillin would take the field.

With regard to local chemotherapy of established infections, his colleagues Purdie and Fry were the first to report the application in streptococcal infections of the surface of the skin; but, unfortunately from the scientific point of view, the dramatic results obtained were spoilt by the fact that the drug was also given by the mouth in order to get the maximum therapeutic effect. Recently with Major A. E. Francis and with the co-operation of Sir Harold Gillies and his colleagues it had been possible to test out the value of this procedure in superficial wounds infected with the streptococcus, and it appeared that in the great majority of them much could be done by clearing up haemolytic streptococci within a very few days, but this work was only at its beginning. Colonel Colebrook ended with a word of caution. These treatments were likely to lend themselves to all kinds of abuse and misdirected effort. There would be a great spate of proprietary preparations, and it was important to make a critical approach, checking clinical impressions by measurements and bacteriological observations.

Benefit of Local Chemotherapy

Mr. EMLYN LEWIS spoke on the application of sulphanilamide powder to wounds and burns, saying, however, that, unfortunately for critical assessment, sulphapyridine had also been given by mouth in a number of the cases. Only sufficient powder was used to cover the wound, and after the application the wound was lightly packed with plain or vaseline gauze, or, where suitable, primary suture of the wound was performed, the powder being applied in the depths of the wound. No ill effects had been noted from this procedure, and as a rule it had not been found necessary to inspect the dressings until the fifth day, and even then it was very often only curiosity which led to this being done. The appearance of the wound was generally satisfactory. There was perhaps a slight discharge on the surface, the examination of which occasionally revealed the presence of organisms, but this did not seem to make any difference to the subsequent course of the case. His colleagues at the base hospitals who saw most of these cases after treatment reported that they were not grossly septic, and certainly their reappearance at the out-patient department, even after large punctured wounds, was much sooner than would be expected in the ordinary course of treatment. Three cases of gas gangrene were encountered; two of them received sulphapyridine by mouth and sulphanilamide was applied locally. Both recovered with suitable surgical treatment and administration of serum. In the third case, a large through-and-through wound of the thigh, gas gangrene was found at operation twelve hours after injury. The wound contained a good deal of debris, including a piece of trouser, and there were typical changes in the abductor longus and crureus. A wide surgical excision was performed, and very liberal quantities of sulphanilamide powder applied, and on recovering from the immediate operation the patient was given sulphapyridine 4 grammes four-hourly for forty-eight hours. At no time was he given any anti-gas serum, and his progress was very satisfactory. On the fifth day when the wound was examined there was no odour, the wound looked healthy, and there was no oedema of the surrounding tissues.

The use of the powder in the primary treatment of second- and third-degree burns occurring on the face, forearm, and hands had been most encouraging. The dressings were usually inspected on the fifth day, when further insufflation of powder was performed. In one severe case of burn, within five days of the sulphanilamide application, the haemolytic streptococci had disappeared, and although staphylococci and diphtheroid bacilli were present a skin graft took successfully.

Comparison of the New Compounds

Prof. A. FLEMING said that it was often assumed that the drug of choice for the streptococcal infection was sulphanilamide, for the pneumococcal sulphapyridine, and for the staphylococcal sulphathiazole. It would be truer to say that sulphanilamide was strong enough to deal with the streptococcal infection; sulphapyridine was rather stronger and able to deal also with the pneumococcal but not with the staphylococcal; while sulphathiazole was still stronger and able to deal with all three. He showed an experiment with an agar plate across which in streaks organisms had been planted, with sulphapyridine applied on the one side and sulphathiazole on the other, and as measured by the distance over which the growth was inhibited there was a definite advantage to the sulphathiazole. This was possibly a useful indication of the

power of the drug to diffuse in the body. The bacteriostatic power of the blood was only one of the things which had to be taken into account; others were rate of absorption and excretion, toxicity, and solubility, which last might well enter into the local application.

Certain substances inhibited the action of these compounds: these included large masses of bacteria, certain peptones and chemicals, and also pus fluid, which in dilutions of 1% still hindered to some extent the effect of the sulphanilamide.

On the subject of penicillin, which he first described in 1929, and which had hitherto been used only for isolating bacteria in the laboratory, it appeared that, weight for weight, it was four times as powerful as sulphathiazole and twenty times as powerful as sulphapyridine, which would make it about one hundred times as potent as sulphanilamide. It had the advantage also of not being inhibited by pus fluids or large numbers of organisms, as the other preparations were. Prof. Fleming thought that if the chemists were able to isolate and manufacture it on a large scale it might replace the sulphonamides. He added a few words in conclusion on the combined use of immunological and chemotherapeutic measures. The great advantage of combining serum with sulphapyridine in experimental gas gangrene had been demonstrated. The very small amount of immunity given by a single dose of vaccine might turn the scale.

Mr. R. MOWLEM described certain work carried out at a unit of the maxillo-facial service of the E.M.S. Burns and extensive lacerations were the chief cause of tissue loss calling for grafting. Patients ordinarily could not reach this specialized unit until a considerable time after their injury, when they were already heavily infected. The method, a variant of that of Colebrook, was as follows:

Ordinary agents, such as saline, sodium sulphate, eusol, or peroxide, were used to create a degree of cleanliness in the wound. After two or three days, when the area was reasonably clean, the powder was applied daily beneath a layer of tulle gras and saline. Only a few patients showed a sterile culture after three or four days of this treatment, but this was not a deterrent to grafting. On the morning of operation the patient was given 2 grammes of sulphanilamide by mouth two hours before being taken to the theatre. On the operating table he was given 5 c.cm. of soluseptasine. The granulations were excised, bleeding controlled, and the whole surface fairly heavily coated with powder, gently massaged into a paste with the serum in the wound. The whole area was next completely covered by the graft, and the usual pressure dressings applied and maintained for seven days. On returning to the ward the compound was given at the rate of 1 gramme four-hourly for thirty hours.

The series was too small to give any value to figures, but it numbered about 40 cases, and so far there had been only one failure. There had been no evidence of local cellulitis or systemic infection. The presence of the layer of the compound beneath the graft did not jeopardize the "take."

Dr. F. HAWKING described an experiment with guinea-pigs which was undertaken to see whether the application of sulphanilamide compound would prevent the development of gas gangrene in an experimental wound. [An account of this work is given by him at pp. 263–8 of to-day's *Journal*.]

Dr. C. A. GREEN contributed a short paper on the action of sulphanilamide therapy on antibody production, and described a long series of experiments on rabbits. Only a brief summary of his conclusions can be given here. They were that the effect of prontosil on the antistreptolysin O response to streptococcal infection in rabbits had been the subject of the investigation. No evidence of inhibition or stimulation of antibody response was obtained. The serum of non-immune rabbits under prontosil treatment had no neutralizing action on streptolysin O, nor were the antihaemolysin O titres of immune rabbits increased by the treatment. The observation, it was considered, might throw some light on the disappointing result of these compounds in the treatment of acute rheumatism as reported by some workers. If the delayed and precipitous rise in antistreptolysin O titre after haemolytic streptococcal infection of the throat was part of the rheumatic process, then prontosil therapy would neither prevent nor reduce the antibody response. On the other hand, the prophylactic use of prontosil in preventing throat infection and thereby eliminating the most common stimulus for increase in antistreptolysin O titre should be of benefit.

Major A. E. FRANCIS described in detail certain results of the procedure of treating wounds locally by the insufflation of sulphanilamide powder. The series consisted of 47 cases with 77 wounds infected with haemolytic streptococci, of which 62 wounds were infected with Group A streptococci, 3 wounds with Group C, 3 with Group D, and 3 with Group G, with six wounds infected with streptococci of undetermined type. In 31 wounds in Group A the streptococci disappeared with local therapy only; in 8 sulphanilamide was given orally as well as locally, and these also remained free; 1 case remained free after oral therapy only; 15 wounds became reinfected or resisted treatment. The 3 wounds in Group C responded satisfactorily to local or combined treatment, but the 3 in Group D resisted local therapy. In the cases infected with Group G streptococci one cleared up under local treatment only, one under oral treatment, and one under combined. The presence of much exudate, pus, sloughs, or deep crevices and pockets prevented wounds from being freed of haemolytic streptococci by the local application of sulphanilamide. The powder must be applied directly to the wound, not over tulle gras or other dressings. It was essential to place moist saline gauze over the wound, which should be covered with a layer of jaconet to retain moisture. Clinicians sometimes objected to the treatment because of the macerated appearance of the skin owing to the continued retention of moisture. If the jaconet were left off for a day or two, however, the normal appearance would be restored.

Dr. WALLESTEIN, who was prevented from developing his subject owing to the time having expired, briefly referred to work now proceeding in the laboratories on new compounds which would shortly be available for the treatment of wounds. One, of which he showed the chemical constitution, was a derivative of trypan blue linked to two sulphonamide groups.

PSYCHOLOGICAL ASPECTS OF DEAFNESS

At the meeting of the Section of Otology of the Royal Society of Medicine on February 7, with Mr. LIONEL COLLEDGE in the chair, the discussion was on "Psychological Aspects of Deafness."

Prof. HUGO FREY of Vienna said that the deaf were not a uniform group. On the one hand there were those suffering from congenital deafness or deafness acquired early in life, and on the other those known as the deafened, whose disability made its appearance in later years. Deaf-mutes formed a separate community, almost a distinct variety of *Homo sapiens*, and an interesting question in studying their psychology was to inquire into their conception of a world without acoustics. The uneducated deaf often appeared queer and not easy to handle. The educated were quite different, being careful and diligent and having great powers of concentration. It was difficult to see why in some cases the absence of hearing should not affect the patient's mentality at all, while in others it led to serious consequences. Such mental anomalies were not the consequence of the deafness, but of some other factors, one of which might be the impossibility for the deaf-mute of discharging his emotions by speech. Most deaf-mutes were from the outset not quite normal people, showing abnormalities of the central nervous system in addition to the congenital hearing defect.

Not all the deafened showed a depressive state of mind or lack of poise. As a rule the deafened overestimated the extent of their disability. There were physiological and psychological reasons for this tendency, but mainly it was due to their greatly exaggerated idea of the personal and social consequences of their defect. There were numerous occasions in daily life when normal people did not hear what they were meant to hear because the speaker was badly articulating or could not adapt his voice to the acoustic conditions. A proof of the frequency of insufficient hearing amongst normal people was the fact that all languages had their popular phrases inviting the speaker to repeat what he had said. But normal people did not mind such failures in hearing, whereas the deafened took them as a further proof of their defect and adopted a more pessimistic attitude to their situation. Occupational difficulties sometimes presented

themselves, but, on the other hand, many occupations could be undertaken successfully by the deafened. Prof. Frey thought that the depression was again insufficiently explained by the degree of isolation and withdrawal from social life which the deafened state entailed. The intellectual life of the present time, broadcasting notwithstanding, depended more on the visual sense than the acoustic; science, politics, news of every kind were conveyed mainly not by the spoken word but by the printed word reinforced by illustration. The higher the standard of culture the more important was the eye and the less, relatively, the ear. Any sense of isolation related only to the more trivial affairs of daily life, and hearing aids and lip-reading could alleviate this disability. One reason for the depression might be found in the reluctance to admit deafness and the attempt to dissimulate it, the habit of not asking for the repetition of words not understood, and the disinclination to use hearing aids.

Many years of observation had suggested an explanation for this exaggerated psychological reaction—namely, that the idea had gone deeply into the subconsciousness of these persons that they were "not right," that the inviolable integrity of their body and its organs had in some manner been impaired, and the psychic shock was increased by the thought of the future progress of the defect and its consequences. With this feeling of reduced somatic integrity and of personal inferiority, the deafened did not consider himself a complete person any longer, and felt himself excluded from the company of the normal. Many of the most depressed cases belonged to the group of otosclerotics. Yet ordinary people, although they might find it a little trouble to converse with the deafened, did not regard them as incomplete persons. The deaf person was often made a comic figure on the stage and in fiction, which suggested that deafness in the eyes of the public was not a very deep defect or of a kind to justify the thoughtful attitude shown to the blind. These reactions of the deafened person to his defect might be overcome by psychological efforts, sometimes spontaneous, at others requiring psychotherapeutic guidance. Only the neurotic deaf believed that the hearing people were the eternally happy ones. The fact that the condition was relieved by the application of mental energy and effort seemed to be the best proof of its neurotic origin and character. Finally, he pleaded that the deaf should receive not sentimental pity but an understanding of their difficulties and inhibitions.

Adjustment of the Personality to Deafness

Dr. A. B. STOKES said that deafness and its psychological associations presented many of the typical problems of psychosomatic medicine. In its basic psychological features there was no difference between deafness and any other sensory, motor, or visceral disturbance. The underlying factor mainly determining the psychological response was the personality make-up. The burden of an organically determined deafness was something to which the personality had to adjust, and the adjustment was of varying kind according to the personality. As shown by behaviour, the adjustment might be within normal limits or might be pathological, which latter could be described in terms of psychiatric categories—for example, paranoid, depressive, or anxiety states. An attempt to understand and explain in terms of psychopathological theory stood or fell by the validity of the particular theories employed. The need for personality studies, including the factor of genetic constitution, required emphasis. Under conditions of stress functional deafness might occur where there were hysterical components in the personality. This might represent a functional addition to a greater or lesser organic deficiency or a functional persistence of a transitory organic disturbance. Again the fundamental factor was the personality. Where the personality make-up was as yet immature, as in children, organic deafness might interfere with its maturation, and considerable disturbance of behaviour result. None the less, even here the constitutional genetic factor would remain as a determinant of the type of behaviour response.

MRS. IRENE R. EWING said that the psychological effects of deafness depended upon many active and reactive factors in addition to the deafness itself—the health and age, the environment and experience, the social attitude and disposition towards difficulties, the intelligence and readiness to acquire new habits, the nature of the work and interests of the patient, and his resourcefulness and sense of humour. Certain psychological problems arising from deafness might be solved by taking into account the otologist's diagnosis together with the results of pure-tone tests of hearing and tests of hearing for speech. The results of these tests showed the extent to which a deaf patient could be enabled to hear speech in all the circumstances of his daily life and the extent to which hearing could be aided by lip-reading, also how far a patient was likely to retain or lose normal speech habits. An analysis of the case histories of typical patients who had attended the clinic for the deaf at Manchester University had been made under four heads: (1) influence upon the patient's manner of thinking (that is, how far the deafness set a limit to the range of his thoughts and interests); (2) capacity to follow the spoken word; (3) ability to talk intelligibly and audibly; (4) employability. All the available evidence combined to show that the most serious psychological extent of deafness was the extent to which it restricted speech experience in each particular case. From this limitation arose all the familiar symptoms of unhappy mental life, uncertainty of action, and distrust of self often seen in deaf patients.

General Discussion

Mr. RITCHIE RODGER said that one of the difficulties with otosclerotics was in learning lip-reading. The child of 4 or 5 learned very easily if he was intelligent, but only a few mature adults ever attained proficiency.

Mr. W. M. MOLLISON said that large numbers of people became deaf after school-leaving age, and it was a pity that there were no arrangements for them to continue treatment after leaving school. Many children left school with a bilateral suppuration of the ears which would lead presently to a high degree of deafness, and there was no machinery for getting them to persevere with the treatment. He had seen a large number of recruits with discharges from the ear who had had no treatment since leaving school.

Mr. F. W. WATKYN THOMAS said that it was most important that the deafened person should be made to realize that his inability to hear conversation might be due to the fault of the other conversationalists. One of the first things he explained to such deaf people was that others perhaps did not speak properly.

Mr. A. W. G. EWING (Manchester University Clinic for the Deaf) said that a feature of the report published by the Board of Education on this subject just before the war was an entirely new scheme of classification of children with defective hearing. The hard core of the problem was the children who were so deaf as not to have talked normally, but there were other groups with lesser defects, and some of these children could remain in a normal school. Then there were children who could be educated to much more normal standards than had been the case in the past, simply fitting a hearing aid and teaching lip-reading. Deaf children were not a homogeneous group; as a whole they were not lacking in practical ability, but when tests of educational attainment were applied to them serious retardation was evident. Children who had had no opportunity to hear speech at all were two years behind at the age of 7, and by the time they reached the age of 15 their mental age was far behind because of the extent to which mental development depended upon the hearing of speech.

The second meeting of the Davyhulme Military Hospital Medical Society was held on February 13, with Colonel R. Errington in the chair. Sixty members and visitors were present and Lieut.-Colonel W. E. Underwood gave an address on gunshot wounds in the field. Further meetings, which will be announced in our Diary of Societies) have been fixed for February 27, March 13, March 27, and April 10, at 3 p.m. Medical men and women in any of the Services (including civilian) will be welcomed.

Mr. H. G. Lawrence, the Minister of Health of the Union of South Africa, recently opened the new Nigel Hospital, which has been built at a cost of £80,000 at Dunotton, Johannesburg.

Correspondence

Optimum Calcium Requirement

SIR,—In your issue of January 11 (p. 49) a paper by Dr. I Harris and Messrs. J. T. Ireland and G. V. James is published in which the conclusions are drawn that "with a high degree of certainty it can be affirmed that the calcium intake under the present dietary regime is ample" and that there is no indication for increasing it. In addition the suggestions are made that high calcium intake may be a contributing cause of arteriosclerosis and that it seriously increases the work of the kidney. These conclusions and suggestions are so unusual and so important, if established, that the evidence requires examination.

The conclusion that the dietary intake of calcium is adequate is based first on data for serum calcium in fifty-one hospital cases. Since these agree, so far as they go, with many other published findings and do not contribute to the later argument, they need not be discussed. The other evidence submitted is that of a series of metabolism studies on adult hospital patients, the absence of clinically detectable "lesions" in such persons, and the deduction, from inquiries regarding the habitual diet of patients, that their calcium intake is never below 0.45 gramme daily and in many instances is "four or five times greater" (presumably between 2 grammes and 2.75 grammes daily). The information refers only to adult hospital cases, and no account is taken of children or pregnant and nursing women.

The first, generally accepted, estimate of the calcium requirement for maintenance of adults was that of Sherman, derived from his metabolism studies, and given as 0.45 gramme daily for a man or, with a "margin of safety," 0.68 gramme. I have elsewhere reviewed the published results of calcium metabolism studies up to 1936, and from the data collected deduced an average adult requirement of about 0.55 gramme daily. The literature has been more recently reviewed by Mitchell, and his estimate for an average woman, neither pregnant nor lactating, would be about 0.54 gramme daily, and for a man up to 0.68 gramme daily for a weight of 70 kg. The requirement for equilibrium deduced by Harris from his metabolism experiments is "between 0.390 gramme and 0.579 gramme daily." He will, therefore, presumably not question the lowest accepted estimate of 0.45 gramme daily as the approximate average maintenance requirement of an adult.

When the requirement of a group of people or a whole population is estimated, the needs of children and of pregnant and nursing women must be taken into account. Stiebeling, using Sherman's estimates of requirements, calculated the average requirement of the American population to be 0.9 gramme daily, and the age and sex distribution of the American population can population is not greatly different from ours. Other estimates are those of Crawford and Broadley for the whole population of England and Wales of 0.70 gramme daily, calculated from the B.M.A. minimum diets, and 1.00 calculated from the League of Nations Technical Commission optimum diets; those of Potts, also calculated from the League of Nations diets, for different groups of households in Yorkshire, all exceeding 1 gramme daily; and my estimate of 0.765 gramme daily for the whole population. In view of these estimates, the standard requirement of 0.6 gramme daily used in *Food, Health and Income* must be regarded as conservative. Yet it is shown there that from the dietary surveys analysed the poorest 10% of the population, including 4.5 million people, of whom half are children under 14 years of age, have on the average only 0.37 gramme; the second group of 9 million, of whom about one-third probably are children, only 0.52 gramme; and the third group of 9 million, with about 2 million children, 0.61 gramme. Since the requirement of these three groups, including about 80% of the children of the country and a large proportion of the pregnant and nursing women, is greater than the average requirement of the whole population, the conclusion that half are subsisting on sup-optimal calcium intake, using a conservative standard, seems justified. The dietary survey data are amply supported by later surveys of Crawford and Broadley, Fry and Myers, Potts, Widdowson, and others. These surveys, carefully made and analysed, also indicate that high dietary intakes of 2 grammes and over must be so uncommon as to form a negligible part of the dietary history of the country.

The failure to find obvious clinical lesions attributable to calcium deficiency is not surprising. It is at least as difficult to diagnose sub-optimal calcium intake clinically as to diagnose deficiency of vitamins in any but the gross manifestations. The main effect of sub-optimal calcium intake in experimental animals, and probably in the human population, is restriction of growth or of milk yield to fit the intake. Long-continued deficiency in adults, it has been suggested (cf. Owen *et al.*), may produce senile osteoporosis, evident on x-ray examination.

The contention that there is danger to the population from increasing the calcium intake is based, first, on the calcium balances with intakes between the equilibrium level and 2.712 grammes daily. These show percentage absorptions and retentions of calcium which are so extremely high and so unlike those recorded in a much greater number of observations on normal adults that the conclusion that they are abnormal can scarcely be avoided. The results of an experiment on two rabbits can hardly be regarded as sufficient to support the suggestion that high calcium intake is a cause of arteriosclerosis. Calcium metabolism in the rabbit is known to differ from that of other mammals, especially in the ease with which its plasma calcium may be raised by dietary means. But even in rabbits attempts to produce calcification of soft tissues by increasing the calcium intake have not always been successful, and other experimental procedures have produced positive results. The inference for clinical medicine of such experiments remains obscure. Further, the statement that according to the Registrar-General's returns arteriosclerosis is "more prevalent among the affluent class" does not appear to be in accordance with the facts. The Decennial Supplement on Occupational Mortality (1931), which, so far as we know, is the only one which distinguishes between classes, indicates that the proportionate mortality at ages over 65 from cerebral vascular lesions and arteriosclerosis together, and both the standardized mortality ratio between ages 35 and 65 and the proportionate mortality at ages above 65 of both men and women from arteriosclerosis (without cerebral vascular lesion), increase to a maximum for Classes 4 and 5—that is, mainly unskilled occupations, the least affluent part of the population and that with the lowest calcium intake.

Harris and his co-workers also quote a formula for calculating the work of the kidney and estimate that increasing the calcium intake may increase the work of the kidney by over fourteen times. Using the same formula we have calculated that the effect on the work of the kidney of increasing the urinary excretion of calcium from the least to the highest figure in the balances recorded by Harris is of the order of 1 in 700. The estimates of Borsook and Winegarden also show that excretion of calcium normally accounts for less than 1 in 1,000 of the total work of concentration, and less than 1 in 700 of the total work performed by the kidney. An increase in urinary excretion to several times that at maintenance intake (if this were possible in normal subjects on a normal diet) would make an entirely insignificant contribution to total kidney work.

Hence, although from the results of their metabolism studies and clinical observations the writers may consider it advisable for certain adults to avoid a high calcium intake, they have produced no evidence that deficiency does not exist in the general population, nor any of danger to normal subjects from such calcium intakes as are considered desirable. They have in no way cast doubt on the accepted standards of requirements or the wisdom of improving the diets of the poor to those standards.—I am, etc.,

ISABELLA LEITCH.

The Rowett Research Institute,
Aberdeenshire, Feb. 1.

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—— and McCance, R. A. (1936). Ibid., 293.

SIR,—In a recent paper by Dr. Isaac Harris *et al.* (January 11, p. 49) on calcium requirement unorthodox and conflicting statements have been made, the accuracy of which warrants a careful inquiry in view of the importance that may be attached to their findings and interpretations at the present time. It is proposed to deal with their paper under various headings.

1. Calcium Balance Studies.—A comparison of the calcium intake and output is a recognized method of determining the calcium metabolism of the body. In normal people about 76% of the total calcium is excreted in the faeces and only 24% by the kidneys. Dr. Harris and his colleagues have reported results where the calcium excretion was greater in the urine than in the faeces. The calcinuria varied from 53 to 73% of the total calcium excreted, with an average figure of 64%. There is one conclusion, assuming the collection of the specimens was accurate, that the cases studied were not normal healthy subjects.

2. Minimum Calcium Requirement.—It has been established by Sherman and his co-workers that the minimum or maintenance calcium requirement is 0.45 gramme daily. On what grounds do Dr. Harris and his colleagues state, "the minimum calcium requirement is probably lower than" 0.45 gramme daily? It must be remembered that calcium balance studies, on which data the minimum calcium requirement was based, are carried out in hospitals with carefully prepared balanced diets and under ideal experimental conditions. It is more than probable that diets taken at home are not balanced, with the result that a too acid or too alkaline food mixture promotes increased excretion and decreased absorption respectively. The figure of 0.45 gramme daily is a conservative minimum when considered in the light of home-feeding and not too high, as Dr. Harris *et al.* state.

3. Optimum Calcium Requirement.—Dr. Harris *et al.* state, "We may take it that the calcium intake covering optimum requirements is one with neither a negative nor a positive balance." That statement is wrong. Many years ago Sherman took great pains to point out the importance of differentiating between minimum (or maintenance) on the one hand, and optimum (or ideal) calcium requirement on the other. He stressed that 0.45 gramme calcium daily was the minimum of actual need and not the normal allowance. In children the optimum requirement is 1.0 gramme daily, and this results in the retention of 0.01 gramme of calcium per kilogramme of body weight each day. In the adult the intake may with safety fall to 0.70 gramme daily. There is not the space to quote in detail work proving the importance, particularly in children, of having more than the minimum intake of calcium. Failure to do this adversely affects growth, weight, maturity, powers of reproduction, onset of senescence, and, so very important, the health of the next generation.

4. Evidence of Calcium Deficiency.—Dr. Harris *et al.* state, "One of us has been looking for years for cases of calcium insufficiency in an extensive hospital practice . . . but not one case was found. The dental surgeon makes *x*-ray examination of the teeth as a routine; he too was unable to draw attention to one case of calcium insufficiency." It is improbable that Dr. Harris or the dentist will detect calcium shortage (the type met with when people live on calcium-poor diets) clinically or by *x*-raying the teeth. To quote Sherman: "Normal growth does not mean normal development. A calcium-poor condition of the body may coexist throughout much or all of the period of growth with normal increase of height and weight and with every appearance of good health as indicated by physical examination." Marked calcium loss, if it has been of long duration, can eventually be demonstrated by an osteoporosis of the skeleton, but before this occurs evidence may be obtained by a study of the calcium balance. Dr. Harris *et al.* in their table on the calcium balances of so-called normal people studied in Liverpool *demonstrate in fact that there is a calcium insufficiency present.* In normal people an intake of calcium over 1 gramme daily does not result in any further increase of calcium retention. When any further increase does occur it is evidence that there is a calcium-poor condition of the body. In Dr. Harris's cases, as the daily calcium intake increased from 0.824, 1.791, 1.990, 2.566 to 2.712 grammes, so the daily retention increased from 0.265, 0.759, 1.393, 1.735, to 1.980 grammes—evidence in fact that these subjects are in a state of calcium deprivation.

5. Calcium Overdosage.—In support of the dangers of calcium overdosage the authors tabulate experiments on *three rabbits.* No protocols are given of dosage or duration of experiments. They found that a calcium-rich diet in rabbits produced an increased calcium content of the aorta. Such findings are in conflict with the views of Kost, while Emmerich and Loew, Gaunt Irving and Thomson, Orr Thomson and Garry, Coward Kassner and Waller, Evvard Dox and Guernsey, and Sherman and his co-workers showed that animals actually benefited greatly from a high calcium intake. Against this mass of scientific evidence, Dr. Harris *et al.*, after observations on only *three* rabbits, would have us believe that all manner of pathological lesions will arise in human beings if they take too much calcium. As previously stated, however, even if the calcium intake exceeds the optimum of 1.0 gramme daily *no further retention of calcium occurs unless the body through deprivation of that mineral so desires and requires it.*

6. Average Intake of Calcium in the Home.—The large majority of our staple foods contain little or no calcium, so it is quite possible for a dietary to be abundant, nutritious, and varied, yet be calcium-poor. Excluding only milk and cheese, an ordinary diet averages about 0.200 gramme calcium daily. We are assured by Dr. Harris *et al.* that in Liverpool "in a good many instances" the calcium intake daily is 1.80 to 2.25 grammes, so we must assume that these people consume daily two and a half to three pints of milk, or six ounces of cheese or variations thereof. I wonder how many adults now consume these proportions of milk and cheese. Have Dr. Harris *et al.* irrefutable data to support their statement that "a considerable amount of evidence exists that large sections of the population are in the habit of using too much of the type of food which is rich in calcium"? I would like to feel assured that Dr. Harris *et al.* have that data, for the danger exists *not with too much calcium but too little.* But the patients Dr. Harris used for his calcium balance studies present the very opposite features of those having too much calcium in their diets. I would like to emphasize that in order to reach the optimum calcium intake the diet must contain milk and/or cheese, and if these foodstuffs are not available one alternative is to fortify with calcium a staple food such as bread.

The paper by Dr. Harris *et al.* cannot be looked upon as a serious contribution to the literature on calcium metabolism. It is lacking in essential experimental details, there is only one reference to previous work on calcium metabolism, of which there is a wide literature, and its conclusions are not accurate. In wartime the nation's nutrition is a very important factor, and not the least is the danger of calcium lack, which is a problem even in peacetime.

Briefly summarizing the points of this letter:

1. The calcium balance studies of Dr. Harris *et al.* are not those of normal healthy people.
2. The *minimum* calcium requirement is 0.45 gramme daily.
3. The *optimum* or ideal calcium requirement is 1.0 gramme for children and at least 0.7 gramme for adults.
4. Dr. Harris *et al.* have clearly demonstrated by their own results that the people they studied in Liverpool are not getting enough calcium in their diets.
5. No ill can result from overdosage with calcium, as the body reaches its maximum retention on an intake of 1.0 gramme daily, which is the optimum requirement of the body.
6. To reach the safety limits of the body's requirement for calcium a diet needs milk and/or cheese, and failing this then additional calcium must be taken.—I am, etc.,

J. DOUGLAS ROBERTSON.
The Middlesex Hospital, London, W.1, Feb. 17.

Vitamin K in Liver Damage

SIR,—I have read with interest the article by Mr. Michael J. Smyth on exploration of the common bile duct for stone (January 25, p. 111). He states: "A certain proportion of surgeons have always been chary about operating upon jaundiced patients, because of the danger of haemorrhage—not vigorous haemorrhage from any particular arteries but a

continuous steady ooze from the tissues which is apt to be continuous after operation in such cases. This lack of clotting power is due to prothrombin deficiency and can be corrected by giving vitamin K in combination with bile salts by mouth before operation, the bile salts being necessary for the absorption of the vitamin from the intestine." Statements such as these (which are common in the literature) give one a false sense of security in the efficacy of vitamin K. The vitamin undoubtedly has a large range of usefulness, but it is without effect in the presence of liver damage.

"Complete obstruction of the common bile duct is extremely damaging to liver function. The degree of hepatic damage is proportional to the length of time that the bile has been dammed back. It follows that obstructive jaundice should always be relieved at the earliest possible moment. Failure to appreciate this is responsible for many post-operative deaths in spite of good surgical technique. If, in a case of jaundice the bleeding time is prolonged and it fails to respond to vitamin K there is strong evidence of hepatic insufficiency. The only way to deal with these cases is by large plasma or blood transfusions before and after operation to make up for the prothrombin deficiency.

The following case illustrates these points: a patient with a five-weeks history of obstructive jaundice was found at operation to have white bile in the biliary passages and a calculus obstructing the lower end of the common bile duct. The calculus was easily removed and the common bile duct was drained with a Maingot's T-shaped tube. In spite of a week's treatment with kapilon 1 c.cm. daily, bleeding time before operation was still double the normal, and so a pint of blood was given before taking the patient to the theatre. After the operation the patient oozed continuously from the wound and six pints of blood were required to restore the haemoglobin to its pre-operative level. Not until four pints had been introduced did the oozing stop. The patient died ten days after the operation from hepatic failure.—I am, etc.,

Middlesbrough, Feb. 4. R. N. HERSON

Effort Syndrome

SIR,—In reply to Surgeon Captain Lambert Rogers's comments (January 25, p. 134) on my letter (December 28, p. 915) I frankly admit that hyperactivity of the thyroid gland cannot be excluded as a possible aetiological factor either in the two cases quoted by me or indeed in a considerable proportion of the cases described under the generic title of "D.A.H." or "effort syndrome." I regret that this aspect of the matter did not receive the emphasis it merited, all the more so as even in the post-war years (1920–6) the possible rôle of thyrotoxicosis in the aetiology of this syndrome was being increasingly recognized. More particularly perhaps the conception that there might be many degrees of thyrotoxicosis falling short of the clinical entity known as Graves's disease seemed about that time to be coming to the fore. Even so I submit that this in no way invalidates my main thesis as to the importance of the mental or psychological background in the overwhelming majority of these cases. Without in the least depreciating the value of surgical intervention in selected cases it could, one imagines, scarcely be applied as a general procedure in a condition which was so widely prevalent as in the last war. It must be remembered, too, that although in my experience the majority of these cases are unlikely to qualify for military service it is quite conceivable that they may react favourably to a return to normal peacetime conditions, and this without resort to any specific surgical treatment. In the absence of any spectacular increase in the male incidence of Graves's disease during the last twenty years it would rather appear that such spontaneous recovery is the rule rather than the exception. The pitfalls involved in the verbal presentation and still more in the diagnosis of a case on such data are notorious, and these Captain Rogers generously acknowledges, but I imagine that neither of the cases referred to would on actual encounter have suggested themselves as suitable for surgical intervention. It is unfortunate perhaps that a third case quoted in my original letter but excluded owing to exigencies of space presented no signs in the least suggestive of thyrotoxicosis but exhibited in marked degree those abnormal nervous and mental characteristics so typical of these cases.—I am, etc.,

Leeds, Feb. 3. J. E. MIDDLEMISS.

Treatment of Jaw Injuries

SIR,—Squadron-Leader H. E. H. Tracy's letter (January 25, p. 136) must have been written without knowledge of the existing arrangements for the treatment of jaw and facial injuries.

Your readers will no doubt have seen the report of the Army Advisory Committee on Maxillo-Facial Injuries and I can assure them that the vital importance of early treatment is fully recognized. Happily the number of cases has not yet been such as to justify the establishment of special maxillo-facial hospitals over-seas, but a suitably staffed section of a general hospital was set aside for the reception and treatment of maxillo-facial injuries in France and another is actually working in the Middle East.

Early and close co-operation between the surgeon and dental surgeon is regarded as essential, and, before being posted to a field medical unit, each Army dental officer attends a special course of instruction in the treatment of maxillo-facial injuries. These courses are given at the Army Dental Corps School of Instruction and have proved to be of the utmost value particularly as the services of a dental officer are available as far forward as the divisional field ambulances.

In this country all cases, whether Service or civilian, are treated in the special centres set up under the Emergency Medical Service scheme, where again the advantages of grouping and team work have been fully recognized.—I am, etc.,

D. CLEWER, Major-General,
The War Office, Feb. 8. Director, Army Dental Service

Suspected Case of Chronic Meningococcal Septicaemia

SIR,—I was interested to read Dr. A. Graham Porter's clinical memorandum (February 1, p. 158), and would wish to stress the point he makes—namely, that this disease is "probably commoner than is supposed and may become increasingly so because of the high incidence of cerebro-spinal fever which has been maintained throughout the year." In the *Journal of the Royal Army Medical Corps*, July, 1926, I reported a short series of these cases and emphasized the importance of the rash as a diagnostic feature. This rash may be described as a recurrent erythema multiforme distributed sometimes over the whole body but showing a predilection for the limbs. On the forearms and the shins particularly it is characteristic of erythema nodosum. There seems to be no doubt that this rash is a septicaemic manifestation. The organism was recovered from the centre of a nodule in one of my cases, and the intensity of the rash tends to be in proportion to the severity of the fever.

The disease may run a very prolonged course, and in one of my cases persisted for two years and four months, but in those days we did not know of sulphapyridine. It is all the more essential, therefore, to make an early diagnosis and to this end it is important that the association of erythema nodosum with meningococcal infection should be more generally recognized. May I repeat, therefore, what I said in 1926: "Given a case of erythema nodosum, suspect meningococcus infection."—I am, etc.,

J. C. KENNEDY, M.D.,
Feb. 7 Colonel, late R.A.M.C. (ret.); sometime Consulting Physician to the Army.

"Egyptian Tummy"

SIR,—I have read the correspondence in your columns on this malady, and would like to add my comments.

In Alexandria during the last war attacks of diarrhoea and vomiting, called "Gippy tummy," were very common in our camp at Ras el Tin. The temperature in Alexandria is equable, and in my opinion not conducive to causing chills. I admit that sudden chills can predispose to gastro-intestinal disturbances: nevertheless I am certain in my own mind that the so-called "Gippy tummy" among our soldiers in Alexandria was due to food-poisoning infections of the typhoid–dysentery—almonella groups. There were in addition protozoal infections caused by amoebae and intestinal flagellates. These facts were brought to light by the team of workers at the Central Laboratory, Alexandria—namely, Major Fergusson, professor of pathology, Cairo; T. J. Mackie, now

he has easy entry to the household. He would thus have an associated power of action as regards the health and surroundings of the members of the family, and thus he, the family specialist, would come to have a most important individual and national responsibility.

Given proper conditions of time and service, institutional facilities, and easier access to patients, the general practitioner would have particular advantages and functions that would make him not superior or inferior to, more important or less important than any other section of the profession, but a man with special functions indispensable to a complete and effective national service. With this friendly and intimate association of family doctors with all sorts and conditions of the people, this wide outlook and independence of thought, the sum total of their influences, medical, social, economic, and political, using these words in their wider sense, must be great. It would be a calamity to throw away this power for good.—I am, etc.,

Westbury, Wilts, Feb. 12. CHARLES E. S. FLEMMING.

SIR,—There must be many medical men like myself—preoccupied with other matters—to whom the proposal of the B.M.A. to set up a commission to settle our future has come as a shock. I freely concede, of course, the academic distinction of the members proposed for the Commission, but is there one among them whose future is not assured whatever happens to the rest of the profession? Every one of us will, of course, be affected to some extent, but it appears to me that the ones who should have most say in the matter are the ones who have most to lose.

Further, I do not believe that the constitution of the B.M.A. is such as to enable it to deal with a question of this magnitude. Surely it is a question which should be thrashed out on parliamentary lines, and not settled for us by the usual medical oligarchs. In my opinion it is high time that an official "opposition" should be organized. Nowadays if a man disagrees with the official policy of the B.M.A. he expresses his disapproval by ceasing membership; I happen to come from a district in which a large number of medical men have done so. In the absence of an organized opposition there is not much else he can do. But can the B.M.A., which professes to represent the profession, afford to allow these men to disenfranchise themselves in this way merely because they disagree with the opinion of the majority? I am not going to argue here about why they do it: I am merely concerned with the fact that they do, and that there is a growing opposition to B.M.A. methods both within the fold and outside it. I believe that unless the B.M.A. takes cognizance of this fact while there is still time and before irrevocable decisions are taken it will run the risk of disrupting the whole profession, and this Commission is the rock on which it will do it. It will be bad for the profession, but fatal for the B.M.A.

Has the B.M.A. sufficient democratic spirit to acknowledge and rope in the opposition, to organize it and subsidize it, and unite the profession over the heads of party disputants? The B.M.A. might then justly claim to represent the profession and could reconsider this question of the Commission with a better prospect of getting its decisions accepted. Is the B.M.A. unaware of this opposition, or does it wish to ignore it? Dare I suggest that there is an "opposition" organization ready made? No, I do not belong to it.

The grandfatherly leader in the *Journal* of January 4 (p. 19) I find definitely alarming. If the B.M.A. really believes that "the present war found the profession well prepared to play its essential part in the struggle" it is likely to find its self-complacency rudely disturbed when the men now on service return home. The last word has by no means been said on such things as the Protection of Practices Scheme and on the men whose services were indispensable at home. Meanwhile it would appear to be our bounden duty to achieve unity in the profession by common agreement, and not, by ignoring opposition, to put up a semblance of it.—I am, etc.,

C. J. STOCKER,
Glasgow, Feb. 6 Lieutenant-Colonel, I.M.S.

SIR,—Every member of the profession recognizes the necessity for reform and the inevitability of post-war reorganization. This is, however, an extremely complex problem, in which doctors, with their various sectional interests, are not the only affected parties.

It is essential for the profession as a whole to discuss these matters, but whether it is possible or desirable to attempt to formulate a policy to meet political and economic conditions which are at present unknown is a different matter. Certain it is that the method by which this Commission has been chosen is open to grave objection, and that this is a democratic method of ascertaining the views of the rank and file of your members is open to doubt.

When the time is suitable the appointment of a parliamentary commission is inevitable, and to such a commission your Medical Planning Commission will be invited to state its views. If these views, which will represent nothing more than the majority vote of what is for all practical purposes a self-appointed committee of forty members, are presented as the decided policy of the whole profession, then the future of the profession will be gravely compromised.—I am, etc.,

London, W.1, Feb. 8. R. BLAIR GOULD.

SIR,—Dr. Charles R. Gibson's letter (February 1, p. 171) should be read by every home doctor. It is democratic and in tune with the aims for which the Allies are fighting. In this Division we have elected a committee for this purpose whose decisions will be presented to the Division. This *ad hoc* committee is representative of various interests—general practitioners of different ages, medical officers of health, hospital service, group medical practice, extension of national insurance. Documents summarizing some services have been circulated: each member is to set forth briefly his own ideals and the framework of his method of attaining them. The next meeting (to be held on Sunday) has for its subject State Medical Service. This appears to be almost identical with the recommendation by Dr. Gibson.—I am, etc.,

Teddington, Feb. 5. P. W. L. CAMPS.

Academic Status of Radiology

SIR,—In a letter published in your issue of January 25 (p. 133) Dr. Ffrangcon Roberts writes: "No one will deny that the advent of radiology in its twofold purpose has been one of the few great revolutions in medicine. In spite of this radiology has acquired in this country no academic status. It has no College of its own. Of university chairs there are none; of lectureships only one or two. In this respect we are lamentably behind all other great countries."

It is true that there is now no professorship in radiology in this country, but I feel that the rest of the paragraph quoted may give a wrong impression of the academic status of radiology in this country. There are at least fourteen official university lecturers in radiology in the Provinces, Scotland, Wales, and Ireland. In London there are no lecturers in radiology listed in the London University staff, but in the great majority of the medical schools (which rank as official schools of the University) the senior member of the radiological staff ranks as a lecturer, and is recognized by the University as an official teacher of radiology.

It is true, also, that there is no College of Radiology, but there is a Faculty of Radiologists with similar functions. The Faculty grants a higher qualification in radiology, the Fellowship, which is taken by examination and thesis. Some of the examiners for this Fellowship are nominated by the Royal Colleges of Physicians and Surgeons. It is an index of the status which the Faculty, although but recently incorporated, has already achieved, that it is one of the few bodies entitled to nominate a representative on the Medical Planning Commission of the B.M.A.—I am, etc.,

S. COCHRANE SHANKS,
London, W.1, Feb. 10. President, Faculty of Radiologists.

Dry Clothing

SIR,—It is well known that absorption of water by dry clothing produces a remarkable amount of heat. I dealt fully with this subject in "The Science of Ventilation and Open Air Treatment" (Med. Res. Cncl. Spec. Rep. Ser. No. 52, p. 233, 1920). Dr. C. K. Vartan (February 8, p. 219) failed to get the effect because his flannel was not dry. To demonstrate the effect fit a cork, with a hole bored through it, to a small bottle, having passed the bulb of a thermometer, round which the material has been wrapped, through the cork. Warm the

bottle in front of a fire so as to dry the material, the thermometer reading about 130° F. Then remove the bottle from the fire and allow the thermometer to return to room temperature. To effect this quickly the bottle can be cooled in water. Then take out the cork with the thermometer, and suspend it in room air. The material absorbing moisture from the air will now heat up the thermometer about 10° F. Clothes aired in a hot cupboard and put on dry will warm the body by taking up moisture from it, hence the comfort of dry clothes. Pleated cotton-wool, rabbit's fur, sheep's wool, flannel and knitting wool all produced much the same rise in temperature.—I am, etc.,

Chalfont St. Peter, Feb. 13. LEONARD HILL

Naming of New Drugs

SIR,—In view of the editorial on "The Rationalization of the British Drug Industry" which appeared in our issue of December 21, 1940, we feel that we are entitled to draw your attention to the fact that the B.D.H. have ever set their face against the policy adopted by foreign firms, and one has been followed by some British firms, of unnecessarily coining names for their own particular brands of medicinal products the manufacture of which is not their exclusive property. I enclose a copy of a slip entitled "B.D.H. Naming Policy" which was issued to the medical profession just a year ago.—I am, etc.,

CHARLES ALEX. HILL
London, N., Jan. 7. Managing Director, The British Drug Houses Ltd

*** This letter has been withheld from publication until now at the writer's request.—ED. *B.M.J.*

Sales of Papworth Industries

SIR,—Sir Arthur MacNalty in his admirable and sympathetic account of the life and work of Sir Pendrill Varrier-Jones (February 8, p. 221) states that the sales of the Papworth Industries amount to well over £88,000. This must relate to some years past, for the figures for 1940 reached £363,434, while those for the associated factories at Enham amounted to £127,622, so that the whole totalled nearly half a million—a great achievement.—I am, etc.,

London, W., Feb. 17. W. LANGDON-BROWN.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The Faculty Board of Medicine has co-opted Sir Walter Langdon-Brown until December 31, 1941. It has also appointed Dr. W. L. H. Duckworth, Prof. H. R. Dean, and Dr. G. S. Graham-Smith to be members of the Appointments Committee of the Faculty for the years 1941 and 1942.

The following candidates have been approved at the examination indicated:

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.—*Part I:* M. Altmann, R. D. Caton, A. Elkeles, J. E. Glasgow, Mrs. Grace M. Griffith, M. Halberstaedter, P. C. Phelps.

UNIVERSITY OF MANCHESTER

Dr. R. E. Lane has been appointed Lecturer in Medicine.

UNIVERSITY OF SHEFFIELD

At a meeting of the University Council held on February 14, Mr. F. W. Holdsworth, M.Ch., F.R.C.S., was appointed Honorary Lecturer in Orthopaedic Surgery.

Prof. G. A. Clark was appointed representative of the University on the drafting committee to be set up to draft a constitution of the proposed regional committee in connexion with the Regionalization Scheme of the British Hospitals Association and the Nuffield Provincial Hospitals Trust.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Arnott and Erasmus Wilson Demonstrations

The following Arnott and Erasmus Wilson demonstrations of specimens in the museum, open to advanced students and medical practitioners, will be given in the theatre of the College, Lincoln's Inn Fields, W.C.: February 24, Mr. R. Davies-Colley, inflammation of bone: February 28, Dr. A. J. E. Cave, anatomy of the cervical plexus: March 3 and 10, Surgeon Rear-Admiral C. P. G. Wakeley, tumours of the alimentary tract: March 7, Dr. Cave, anatomy of the brachial plexus: March 11, Mr. Davies-Colley, tumours of the breast: March 14, Dr. Cave, innervation of the body wall. All the demonstrations begin at 3 p.m.

At a meeting of the Council of the Royal College of Surgeons of England, held on February 13, with Sir Hugh Lett, Bt., President, in the chair, the Hallett Prize was presented to Mr. J. D. T. Jones of Durham University.

Mr. E. K. Martin of University College Hospital was re-elected a member of the Court of Examiners.

It was reported that Mr. John Hunter and Mr. A. Wilfrid Adams had accepted the invitation of the Council to act as representatives of the College on the Medical Planning Commission.

Mr. Ernest W. Hey Groves was re-elected as the representative of the College on the General Medical Council.

Dr. A. P. Cawadias was appointed Thomas Vicary Lecturer for 1941.

It was decided to recognize the post of second surgical officer at the Royal Gwent Hospital, Newport, under paragraphs 21 and 23 of the F.R.C.S. Regulations.

Diplomas

Diplomas of Membership and Diplomas in Public Health and Medical Radiology were granted to the candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London published in the *Journal* of February 8 (p. 223).

The Services

AWARDS AND MENTIONS IN DISPATCHES

M.B.E. (Military)

Lieut. Robert Elmer Horton, R.A.M.C., has been appointed an M.B.E. (Military Division) for conspicuous gallantry in carrying out hazardous work in a very brave manner.

G.M.

Lieut. John Richard Monks, R.A.M.C., has been awarded the George Medal for conspicuous gallantry in carrying out hazardous work in a very brave manner.

Mentions in Dispatches

Major M. H. Wace, I.M.S., and Captain B. A. Coghlan, E.A.A.M.C., have been mentioned in dispatches for distinguished services in the field in Somaliland.

Corrigendum

In the list of officers whose names have been brought to notice in recognition of distinguished services in connexion with the operations in the field, March to June, 1940, published in the *Journal* of January 4, the initials of Captain O. M. Walker, R.A.M.C., should read Captain D. M. Walker, R.A.M.C.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Wounded

Temporary Acting Surgeon Lieutenant-Commander Wolsey Cornwall Sloan, R.N.V.R.

ROYAL ARMY MEDICAL CORPS

Lieut. JAMES CUNNINGHAM is included as "Died" in an Army Casualty List published on February 14. He was educated at Glasgow University, where he graduated M.B., Ch.B. in 1925, when he joined the British Medical Association.

Lieut. JAMES IAN MCCONNELL, who was posted as "Missing, believed Prisoner of War" in the *Journal* of June 1, 1940, is

now reported as having died in an Army Casualty List published on February 14. He was educated at Durham University, graduating M.B., B.S. in 1939, and had held the post of house-surgeon at the Royal Victoria Infirmary, Newcastle-upon-Tyne. His home was at Tynemouth, Northumberland.

Wounded

Lieut. James Morton Muir.

Prisoner of War

Lieut.-Colonel Donald McMichael Crawford.
Lieut. Abraham Lemel Karstaedt.
Lieut. Norman Bryan Walker.

DEATHS IN THE SERVICES

Colonel GEORGE DANSEY-BROWNING, C.B.E., died at Sidmouth on February 2, and the following account of his career has been sent by Major-General Sir G. Guise Moores, K.C.B.: George Dansey-Browning was a fine type of Army medical officer, one who gave to the end of his days a full devotion to the soldier and his interests. Born in 1870, he was educated at the Lycée l'Orient, Rennes, and the University of Paris. He was an accomplished French scholar. Dansey-Browning was a student of Westminster Hospital, taking the diplomas of M.R.C.S., L.R.C.P.; he then in 1894 joined the R.A.M.C. by open competition. It is difficult to recall any period of his forty-five years' work for the Army in which he found a respite from his labours. At his homecomings in his early career from India, China (medal), Egypt (medal and Order of Osmanieh), he occupied his leisure and leave in taking the diplomas of D.P.H., D.T.M., and the M.R.C.P. While in Egypt he served on the Sudan sleeping sickness commission During the last war Dansey-Browning was appointed M.O.H., Gibraltar. His investigations were chiefly concerned with diseases incidental to a Mediterranean garrison and those brought in by the varied and shifting population of a great maritime port. For his services he was awarded the C.B.E. and the French medal for epidemics. The war over, he went to India as A.D.M.S. of the Meerut and Lucknow Divisions, and retired in 1922. Then followed an appointment as director of the newly formed Enham Village Centre for disabled soldiers This accomplished, Dansey-Browning elected to take a retired pay billet as medical officer to the R.E. training camp at Longmoor; here he gave up all else in unstinted devotion to the soldier and his family. He formed centres for dealing with the welfare of mother and child with outstanding merit and success. The age limit stepped in and his work at Longmoor ended, but his love of his profession enabled him to carry on in London at the Regent's Park Barracks, and at the oncoming of the new war in 1939 with the Irish Guards Training Battalion. In December last the physical ills that flesh is heir to became manifest and the labourer's task was o'er, though undaunted was the spirit. Dansey's ways were ways of gentleness, with the simple piety of devotion to the sick and needy, and he will be long remembered as a well-tried and beloved physician.

Lieut.-Colonel CHARLES EDWARD PERCY FOWLER, O.B.E., R.A.M.C. (ret.), died after a long illness at Wickham Bishops, Essex, on January 21, aged 74. He was born on January 27, 1866, at Milverton, Somerset, and was educated at Bristol and at St. Mary's Hospital, London, qualifying M.R.C.S., L.R.C.P. in 1889. He was granted the diploma of F.R.C.S. two years later and took the D.P.H. of the University of Cambridge in 1894. He entered the Army as surgeon lieutenant in 1893, became major in 1905, retired in 1914, rejoined for service in August, 1914, and received a brevet lieutenant-colonelcy in 1917. He served as assistant professor of hygiene at the R.A.M. College from 1903 to 1907, as medical officer of health and sanitary officer, Gibraltar, from 1907 to 1912, and then for a year as instructor in the Army School of Sanitation. In 1909 he accompanied a British mission to Fez, Morocco. During the war of 1914–18 he served as A.D.M.S. of the Egyptian Expeditionary Force and subsequently as D.A.D.M.S. at Aldershot.

Surgeon Captain FRANCIS BOLSTER, C.M.G., R.N. (ret.), died at Biggleswade on February 11. He was educated at Trinity College, Dublin, as an undergraduate was resident pupil at Sir Patrick Dun's Hospital, Dublin, and graduated M.B., B.Ch. in 1896, proceeding M.D. in 1905. Entering the Royal Navy soon after qualifying, he became surgeon commander in 1911 and surgeon captain in 1924. He served during the war of 1914–18, and was present at the Battle of Jutland and received the medals and the C.M.G. In 1919 he was awarded the West London triennial medal for heroism on a sinking ship during the Battle of Jutland. He had been a member of the British Medical Association for thirty-four years.

Obituary

JAMES ALLAN, M.D., D.P.H.

Dr. James Allan, who (as recorded in last week's *Journal*) died at his home in Leeds on January 28, was for forty-four years medical superintendent of St. James's Hospital (formerly the Leeds Union Infirmary), a post from which he retired in 1925.

Born in 1853, the son of William Allan, farmer in Birnie, near Elgin, he was a member of the 1870–4 arts class at King's College, Aberdeen, and graduated in medicine, with honours, in 1877, taking his doctorate three years later. After spending nearly two years as house-surgeon and house-physician in the Northern Hospital, Liverpool, he was appointed in 1879 assistant medical superintendent of the Wandsworth and Clapham Union Infirmary. In 1881 he was appointed medical superintendent of the Leeds Union Infirmary. During his long tenure of this office he played an important part in the developments which took place in this institution. Perhaps his most outstanding contribution was the great improvement which he effected in the nursing service. The nursing staff at the time of his appointment numbered nine, and they were untrained. Almost their sole qualification for acceptance as nurses was that they should be able to read and write and understand written directions for the administration of medicines. Some years later the systematic training of nurses was instituted, Dr. Allan himself giving the lectures, and the examinations, both written and *viva voce*, being conducted by Dr. Wardrop Griffith. As a result, the whole status of the nursing staff was raised and the care of the sick poor entered upon a new phase.



In all this work Dr. Allan had a strong supporter in Mr. (now Sir James) Ford, clerk to the Leeds Guardians, with whom he worked in close collaboration during the whole period of his service. As superintendent Dr. Allan's outstanding characteristics were conscientiousness and diligence in the performance of his duties, and he was held in the highest esteem by the members of his committee. Physician and surgeon too, it was only under pressure that he finally agreed to the appointment of a consulting surgeon on the staff. Prior to this he had done most of the operating himself. It was in the post-mortem room, however, that he was really in his element. After a long and arduous day's work in the wards, the operating theatre, and the office, he would regularly start work in the post-mortem room at 10 o'clock at night and carry on into the small hours of the morning—and he expected his residents to attend these seances!

Dr. Allan was elected a member of the Leeds and West Riding Medico-Chirurgical Society in 1881, and he occupied the presidential chair in the 1907–8 session. He was a most regular attendant at its meetings and at those of the Leeds Pathological Club, of which he was an original member and zealous supporter. His connexion with the British Medical Association was a long and honourable one. He was elected a member in 1882 and for twenty-six years (1905–31) he was honorary secretary of the Leeds Division. During most of this time he was also a member of the Representative Body, and in 1920–1 was chairman of the Yorkshire Branch. He married Miss Elizabeth Williams in 1882 and is survived by three daughters. Three of his grandchildren are students of medicine; a fourth is with the Army of the Nile.

Dr. Allan was a man of fine physique and dignified presence. Austere and reserved in demeanour, he was tenacious of his

opinions and a difficult man to move once he had made his mind. With all this he possessed a quiet sense and a critical faculty which on occasion could find witty and even sarcastic utterance. Those who knew him to be his friends retain the memory of an upright fearless man, who faithfully served his profession city of his adoption throughout the active years of He was buried in the churchyard of his native village where he lies with many generations of his forebears.

[The photograph reproduced is by Lafayette Ltd.]

W. H. C. NEWNHAM, M.A., M.B., M.R.C.S.

We regret to announce the death of Dr William Henry Christopher Newnham, which took place at Clifton on January 11; he was in his eighty-fifth year. For many years Dr. Newnham was one of Bristol's leading medical men. He was born at Wolverhampton, where his father practised for many years. From Wolverhampton Grammar School he went up to Genville and Caius College, Cambridge, in 1874, graduating B.A. and proceeding to M.A., M.B. in 1883. He had obtained the M.R.C.S. diploma in 1880. After leaving Cambridge he became a student at Guy's Hospital, where he held the posts of house-surgeon and resident obstetric officer. His next appointment was resident medical officer at the Evelina Hospital for Children. He went to Bristol as house-surgeon at the Bristol General Hospital in 1887. At the end of three years, having decided to specialize in obstetrics and gynaecology, he was appointed to the post of assistant obstetric physician to the hospital, and on the death of Dr. Aust Lawrence in 1897 he was appointed obstetric physician; retiring under the age limit in 1923. He soon acquired an extensive practice in his specialty, and played a prominent part in the development of the obstetrical and gynaecological department of the Bristol General Hospital.

Dr. Newnham was devoted to his hospital work. He took the greatest interest in his patients, usually visiting them every day. Even after his retirement he frequently came down and did a round of the wards, and was always warmly welcomed by the patients and hospital staff. Dr. Newnham was a former president of the Bristol Medico-Chirurgical Society, a Fellow of the Royal Society of Medicine and a member of the British Medical Association for forty-nine years. His principal relaxation was the theatre and a game of bridge. He married a daughter of the late Mr. William C. Beloe of Clifton, and has two daughters. He suffered a grievous loss when Mrs. Newnham died several years ago from which he never really recovered. Until a few weeks before his death he was very active and took the greatest interest in everything. He will be greatly missed by a large circle of friends in Clifton.

ELIZABETH HURDON, C.B.E., M.D.

The death of Dr. Elizabeth Hurdon, which occurred in January at her home in Exeter, will be mourned by her many friends and colleagues, both in Great Britain and America. She was known as an outstanding personality in the medical profession for her work on the pathology and treatment of cancer in women and her brilliant success as the first director of the Marie Curie Hospital, London.

She was born in Bodmin, Cornwall. *Early in life* she migrated with her family to Canada, where she studied medicine at the University of Toronto, taking her M.D. degree in 1895. She then went to the Johns Hopkins Hospital, Baltimore, where she studied under Sir William Osler, later being appointed assistant to Dr. Howard Kelly in his gynaecological department, gaining thus a very thorough knowledge of pathology and gynaecological surgery. *She settled in private practice* in Baltimore, remaining there until the last war. In 1915 she joined up with the rank of Captain, R.A.M.C., and served in Malta and later in Salonika, where she had the charge of [illegible] beds reserved for cases of dysentery, and was able to [illegible] value of anti-dysenteric serum. Finally she was [illegible] to military hospitals in Greenwich and Woolwich [illegible] being demobilized.

[illegible] the late Dr. Helen Chambers conceived the idea [illegible] a hospital for the clinical research and treatment [illegible] in women. A Cancer Research Committee was [illegible] consisting of the senior gynaecological surgeons of [illegible] Garrett Anderson, the South London, and the [illegible] Hospitals, and those of the gynaecological unit [illegible] Royal Free. A loan of radium was obtained through [illegible] Medical Research Council from the Empire Cancer Campaign and a grant towards the expenses of a director of research. It was not difficult to choose that director. Dr. Elizabeth Hurdon held all the necessary qualifications. She had been an associate in gynaecology at the Johns Hopkins Hospital, she had had a wide experience of team-work in the highest sense under the "Big Four" of the Johns Hopkins Hospital, she was a Fellow of the American Chirurgical Society, and had been a collaborator with Howard Kelly in the publication of two important textbooks. Moreover, she had a knowledge of foreign languages and American and foreign medical literature. The success that followed this choice which soon developed into the founding of the Marie Curie Hospital, would not have been possible had it not been for the enthusiasm of its director. She visited most of the continental and American clinics in which cancer was being treated by radium and x-ray therapy, and together with the Cancer Research Committee elaborated the technique to be followed. But it was especially due to Dr. Hurdon that such a difficult piece of team-work was made possible.

Her loyalty and unfailing good temper, her wide knowledge, her generous advice, and, above all, the scrupulous care insisted upon in the pre- and post-operative care of the patients—these were the factors that made what was a great experiment into a brilliant success. Two years ago she retired from the post of director, receiving from His Majesty the King the Order of Commander of the British Empire. She then devoted herself to the writing of a book on cancer of the uterus, giving the results and experiences of the Marie Curie Hospital, and it is hoped that this much-needed work may shortly be published.

JOHN GILLIES PRIESTLEY, M.C., D.M.

By the death of John Gillies Priestley, which occurred on February 9 at the age of 61 years, the School of Physiology at Oxford has suffered a loss which, at this critical time, it can ill afford. To many his friendship meant much. A man of great personal charm, generous to those in need, and always ready to lay aside his own work to help those who sought his advice or encouragement, he had for many years to face ill-health, and to the end he fought against this with characteristic courage. If he was critical of the work of others he was still more critical of himself, and to those who were his pupils he tried to impart something of that accuracy of observation and careful judgment which distinguished his own researches. With a clear perception of the relationship of physiology to medicine he was largely responsible for initiating a practical course of human physiology in the Honours Course at Oxford.

Priestley was educated at Eton and Christ Church, where he gained an open scholarship in 1898. Whilst reading physiology at Oxford he came under the influence of John Haldane, and the friendship thus begun had a profound influence on his future career. As soon as he had taken his degree he joined Haldane in the investigation which resulted in 1905 in the publication under their joint authorship of the well-known paper on "The Regulation of the Lung Ventilation," which has played so large a part in the development of physiological knowledge. He then completed his medical qualification at St. Bartholomew's, and it was just after this that he suffered a serious illness which was destined to leave him with permanently impaired health, a tragedy indeed to one who had served with distinction at Oxford and had a keen interest in

outdoor sport and big-game shooting. Within a year or two he was back in Oxford, and at once began a series of researches on the part played by the kidney in regulating the composition of the blood. Then the European war broke out. He at once volunteered for service, and, receiving his commission in the R.A.M.C. on September 1, 1914, he served in France and Belgium, gaining the Military Cross and being mentioned in dispatches in 1915. Later on in the war he was recalled to England, and there took part in a valuable investigation into the after-effects of war-gas poisoning. When peace came he returned to Oxford and was appointed Reader in Clinical Physiology. Receiving a scientific grant from the B.M.A. in 1920, he continued to work on various aspects of the physiology of respiration and on the kidney, and no one could have been more fitted than he to be associated with Haldane in preparing the new edition of Haldane's book, *Respiration*, a task to which he devoted an immense amount of care. He was joint author, too, of *Human Physiology, a Practical Course*, which has passed through two editions. Later on he was interested in certain problems of general metabolism and muscular exercise, and undertook a critical examination of methods for ascertaining the output of the human heart, his last paper on this subject being published barely two months before his death.

The Physiological Society owes to him the preparation of a subject index of the first sixty volumes of its journal, and for some years he edited *Physiological Abstracts*, in which he was able to employ his expert knowledge of the international decimal classification of scientific papers.

He leaves a widow and a son, Major Charles Priestley, R.A.

HAROLD SCURFIELD, M.D., C.M., D.P.H.

A familiar figure in the public health world of the first quarter of the century has passed away in the death at Letchworth on February 8 of Dr. Harold Scurfield, formerly medical officer of health for Sheffield.

Scurfield was born at Sunderland in 1863, and was educated at Birkenhead School, from which he went to the University of Edinburgh. He qualified M.B., C.M. in 1885, took the M.D. of Edinburgh four years later, and subsequently the D.P.H.Camb. After holding various appointments in Lancashire he returned to his native Sunderland at the age of 27, where he became medical officer to the Post Office and surgeon and agent to the Admiralty. This was followed in 1896 by his appointment as medical officer of health for Sunderland county borough and port. In 1904 he was appointed medical officer of health for the City of Sheffield, and there he remained until his retirement in 1921. It was an arduous post to fill, in the fifth largest town in England, with a population approaching half a million, and with much overcrowding, the legacy of the rapid development and prosperity of the steel industry which Sheffield had enjoyed and suffered in the nineteenth century. Many improvements were effected during Scurfield's time, and many more have been effected since, and the largely transformed Sheffield of to-day, with a death rate lower than most of the other industrial towns of Yorkshire, owes not a little to his seventeen years' work there. One problem which had always interested him was tuberculosis, especially from the standpoint of preventive measures and administrative control, and he wrote many papers on the subject. At the International Tuberculosis Congress at Rome in 1912 he was rapporteur on the subject of tuberculosis in the British Isles. He was the translator of Prof. E. Nocard's *Les Tuberculoses Animales*, and the author of the volume on *Infant and Child Welfare* in the English Public Health Series in 1919. He also published a number of lectures he had given in Sheffield in 1909 on the report of the Poor Law Commission. These were delivered from the chair of Public Health in Sheffield University, which he held together with his medical officership. From 1910 to 1913 he was examiner in preventive medicine and public health for the University of Oxford. In later years he was to be seen at almost every congress which had to do with sanitation, public health, tuberculosis, and infant welfare, where he reported for one of the medical journals, and occasionally made a brief but always practical contribution to the discussions. When the British Medical Association held its Annual Meeting at Sheffield in 1908 he was vice-president of the Section of Public Health and Forensic Medicine.

In his early days Scurfield was a rugby footballer and had a place in the Edinburgh University XV. Latterly he had lived in retirement at Folkestone. He had been twice married, and by his second wife had four sons and four daughters.

The death of Dr. A. G. HERON, a well-known and respected physician in the Dromara district, Co. Down, was announced on January 1. Dr. Heron was educated at the Royal Belfast Academical Institution, entering upon his medical course at the Queen's College, Belfast, in 1894 with the Lady Packenham Scholarship. He took the B.A. degree of the Royal University of Ireland, and graduated M.B. in 1901. He was a keen rugby player in his university days, was several times chosen for the Ulster side, and in 1901 played for Ireland. Immediately after he qualified he went out to South Africa, where he acted as a civil surgeon in a Field Force, and there he remained for a year before returning to Britain to take up an assistantship in London. Although he was offered a partnership he preferred, two years later, to go back to Ireland, where he established a practice in Dromara and was appointed dispensary doctor for the district. In 1908 Dr. Heron obtained his M.D., and continued his medical studies by taking post-graduate courses in both London and Belfast. In the last war he served in France with the R.A.M.C. in 1917–18.

Dr. HUGH G. WILSON died at Larne Harbour on January 13 after two months' illness. He graduated M.B., Ch.B. at the University of Glasgow in 1912, and with the outbreak of war joined the R.A.M.C., serving with the Royal Irish Rifles from 1914 to 1918. He did not take up general practice, but devoted his time to the sea, making many voyages as ship surgeon. Later he settled in Larne, and when war came in 1939 he volunteered for A.R.P. work, being particularly interested in the organization of the mobile post in his area. In his university days Dr. Wilson was well known as an Irish rugby international, being capped eighteen times. Among his interests in later years was welfare work for ex-Service men.

Dr. ROBERT ALEXANDER MORRIS, J.P., died suddenly at Harrogate on January 25, at the age of 68. From Morpeth Grammar School he went to study medicine at Newcastle-upon-Tyne, taking the English Conjoint diplomas and the M.B., B.S. degrees of Durham in 1894, and proceeding to the M.D. in 1909. At the University of Durham Medical School he won an entrance scholarship, the Gibb scholarship for pathology, and the Dickinson scholarship and gold medal. After serving as resident house-surgeon at the Royal Victoria Infirmary, Newcastle-upon-Tyne, he practised at Bedlington, and then about fifteen years ago went to Harrogate, where he entered into partnership. Dr. Morris was a Justice of the Peace for the County of Northumberland and much interested in golf and Freemasonry. He had been a member of the British Medical Association for forty-one years. In 1935 he recorded in detail jointly with Drs. Sinclair Miller and Thacker Neville in the *British Medical Journal* a case of agranulocytic angina.

Dr. WILLIAM ARTHUR REES, O.B.E., who died suddenly at Swanage on January 29, had been a distinguished student of the Middlesex Hospital, where he won an exhibition and the Broderip scholarship. He graduated M.B. of London University in 1903, took the F.R.C.S. in 1904 and the M.D. in 1906. He was casualty medical officer at the Middlesex Hospital and registrar and pathologist at the Bolingbroke Hospital, Wandsworth, and during the last war temporary Captain R.A.M.C. After settling at Swanage Dr. Rees became honorary medical officer to the local cottage hospital and surgeon to the Dorset Red Cross Children's Hospital. Ll. A. B. writes: As a partner of the late William Arthur Rees for the past twenty-nine years, I wish to pay tribute to one with whom I worked in perfect friendship all the time. He was a partner *par excellence*, a loyal comrade, and a tower of strength to those who had the pleasure of working with him. Possessed

of great clinical acumen. he never forced his [illegible] professional ability on anyone and was always ready to [illegible] any criticism of his cases, or his treatment of [illegible] the greatest respect. I have no doubt that the [illegible] through in France in 1915–18 and the overwork [illegible] three months caused his sudden collapse from [illegible] bosis at the age of 62. His patients were devoted [illegible] he always gave of his best to them.

Dr. CHARLES WILLIAM CHAPMAN died at [illegible] Hants, on January 31 in his ninety-eighth [illegible] trained at Guy's, and qualified L.S.A. and M.R.C.S. [illegible] L.R.C.P. in 1868, M.R.C.P. and M.D Durham [illegible] counted among his personal friends Lord Lister, Sir [illegible] Wilks, Sir Charters Symonds, and Sir James Cr[illegible] In the early days of his career he was attached [illegible] request, to a special unit to fight a cholera outbreak [illegible] After some years of general practice he specialized [illegible] logy, and became attached to the National Hospital [illegible] Diseases of the Heart, of which hospital he was [illegible] years senior physician. One of Dr. Chapman's [illegible] possessions (writes J. E. R.) was a testimonial subscribed [illegible] mostly in coppers—by his out-patients at that hospital [illegible] published three textbooks, the last, *The Heart and Its [illegible]* being produced at the request of E. and S. Livingstone when he was 83 years of age. Some of his old patients had such faith in him that they insisted on his examining them occasionally long after he retired. I know that two patients travelled from London last year for this purpose. He could thus claim to have practised medicine for seventy-four years. He was active in mind and body to the last, and only a few days before his death he dressed and came downstairs as he did every day. He read the *B.M.J.* and the *Lancet* every week to the end, and he was naïvely proud of *his soft arteries*—and they certainly were wonderfully soft for a man of his age. He was a lovable character and a man who had disciplined himself strictly and practised his profession all his life with only the interest of his patients at heart. He is survived by a widow, two sons, and two daughters. One of his sons, Dr. David Chapman, is in practice at Bridlington, Yorks.

By the death of GEORGE HENRY MASSON O.B.E., M.D., F.R.C.P.Ed., the West Indies has been robbed of one of its most brilliant sons. He was a man of outstanding intellectual attainments. In addition to his many academical qualifications he was a linguist of no mean order. He received the O.B.E. in June, 1936. He had been a member of the British Medical Association for sixteen years, and in 1933–4 was president of the Trinidad and Tobago Branch. A student under Sir Robert Philip (writes E. C.), Dr. Masson built up a tuberculosis dispensary scheme in Port of Spain at a time when the majority of cities in Great Britain had barely begun to consider the project. Yet this great work formed only a part of his contribution to public health in the West Indies. But it is not by these achievements alone that he will be remembered. He had one of those rare personalities that inspired a deep sense of affection, as well as respect, in his colleagues. Despite his distinguished record he was modest and unassuming, always prepared to listen to other men's problems and to give advice and help. To those of us, West Indians and Europeans alike, who enjoyed his friendship his death has been a heavy blow.

Nearly 700 applications from fever or tuberculosis nurses have been received in answer to the recent appeal of the Minister of Health. Particulars of nearly 300 of these—250 fever nurses and fifty tuberculosis nurses—have been sent to the medical officer of health of districts known to be in need of their services. Of the remainder, forty applicants are unwilling to work outside their own district, and are not at present needed there. About 200 have proved unsuitable: and the other 150 applications are being sifted rapidly. Still more fever and tuberculosis nurses are wanted, particularly those who are willing to go wherever they are needed. Applications, giving name, address, age, qualifications, and experience of fever or tuberculosis nursing, with particulars and date of certificate, etc., and present employment, if any, should be addressed to the Minister of Health, Whitehall, S.W.1, and the envelopes marked "Fever Nursing."

Medical Notes in Parliament

National Wheatmeal Flour

Mr. LLOYD GEORGE told Sir Ernest Graham-Little on [illegible] 12 that the term "wholemeal" was loosely applied [illegible] made from flour containing between 80% and 100% [illegible] meal berry. Lord Woolton was arranging that a flour, [illegible] as national wheatmeal, milled to standards laid [illegible] by his scientific and technical advisers, would shortly [illegible] available by all controlled flour millers at the same [illegible] as national straight-run flour. It was not Lord Woolton's [illegible] to withhold subsidy from bread made from other [illegible] flours providing the conditions of subsidy were [illegible]

Food Rationing

In the House of Lords on February 18 a debate took place [illegible] provision of essential foods for the civilian population [illegible] the defence Forces. Viscount DAWSON urged that there [illegible] be a nearer equation between the food granted to the [illegible] and to the civilian population than was the case in [illegible] war. There was, he said, no evidence of resulting [illegible] from rationing, though there was a reduction in [illegible] in some cases. He urged that there should be a [illegible] importation of powdered whole milk and powdered [illegible] milk, as well as vegetable protein in the form of powder. He congratulated the Minister on the projected sale of the standard wholemeal loaf and appealed to the people of the [illegible] to realize what they were losing by not gradually [illegible] themselves to eat wholemeal bread. Lord WOOLTON, Minister of Food, replied.

Treasury Grants to Universities

On February 18 Mr. PICKTHORN asked the Chancellor of the Exchequer if he could make a statement on the Treasury grant-in-aid to the universities and colleges during the coming financial year. Sir KINGSLEY WOOD said that the House would recall that, in view of the vital part played by the universities in the life of the community, the importance of maintaining so far as possible the standards of university education, and the essential contribution which the universities were making in a variety of ways towards the national effort, it was decided to maintain the provision for the current year at the same level as that in 1939—namely, £2,149,000. These considerations had lost none of their force, and in spite of the increasing strain on the national finances, the Government, after considering a report from the University Grants Committee, had reached the conclusion that if the universities were to continue their present contribution to the national effort the provision for 1941 must be maintained at the existing level. They earnestly hoped that local authorities would take similar action.

Medical Attendance on Home Guard.—On February 18 Captain MARGESSON said that a private medical practitioner giving free attendance to a Home Guard casualty or casualties, incurred in action with the enemy, would be entitled to call on such Army medical services as were operating in the area to provide any necessary assistance.

Superannuation and Military Service.—The Service Departments are reviewing the question of the superannuation benefits of officers and nurses employed in voluntary hospitals and serving in units of His Majesty's Forces.

Notes in Brief

Proposals have been received by the Ministry of Health from a group of nutrition experts attached to the California Institute of Technology to supply to this country in syrup, powder, and tablet form certain vitamins and other ingredients which, it is claimed, have been proved to bring about improvements in health. They are under consideration with other Departments concerned.

The Ministry of Home Security has issued about 1,250,000 anti-gas helmets for babies, each helmet accompanied by the printed leaflet of instructions.

Out of 53,467 children inoculated in Liverpool during the years 1925 to 1939 inclusive the number of deaths from diphtheria was ten. Statistics of inoculations during 1940 are not yet available, but it is known there were no further deaths among the inoculated children.

Medical News

The annual meeting of the Central Council for District Nursing in London will be held at the County Hall, Westminster Bridge, S.E., at 2 p.m., on Thursday, February 27.

The University Extension and Tutorial Classes Council in co-operation with the Central Association for Mental Welfare proposes, if there is sufficient demand from general practitioners, to hold this year as usual a course of lectures on and clinical instruction in mental deficiency. The course, which will probably be held at Oxford, will include: (1) Lectures on the nature of mental deficiency, its pathology, causation, and classification (Dr. A. F. Tredgold), administrative procedure under the Mental Deficiency Acts, the work of the school medical officer in relation to defectives, and the psychology of defectives. (2) Clinical demonstrations with, it is hoped, a visit to a certified institution. (3) Mental tests of individual children. The registration fee will be 10s. 6d. and the fee for the course £5 15s. 6d. A suggested date is March 24 to April 4, but the course can only be held if the number of applicants justifies it. All who intend taking the course, therefore, should make application at once to the honorary secretary, Miss Evelyn Fox, c/o University Extension Department, University of London, 24, Buckingham Palace Road, S.W.1.

In view of the confusion which has arisen, the Minister of Health has approved the following names as the "proper names" for the purposes of Part I (A) of the Second Schedule of the Therapeutic Substances Regulations, 1931: (1) Anti-typhoid-paratyphoid A, B, and C vaccine. (2) Anti-typhoid-paratyphoid A and B and cholera vaccine. No abbreviation should be made in respect of the latter name.

Dr. A. J. Ireland, now serving with a commission in the R.A.M.C., and formerly in practice at Tunstall, Staffs, was bound over for two years at Chester Assizes on February 17 by Mr. Justice Croom-Johnson. The charge, to which he pleaded guilty, was that of giving false information concerning a birth and making a false statement that a birth had taken place. The trial followed a case at the last Assizes in November, in which his wife Lizzie, also known as Lady Haldon, was sentenced to three years' penal servitude on charges of conspiring and making a false claim about the baby's birth and two charges of bigamy. His commanding officer described Dr. Ireland as an exceptionally eager professional man and a most capable officer, and it would be a great loss to the Army if it were deprived of his services. The judge, passing sentence, said: "I think the public interest will best be served by allowing you to go back and continue your duty. I had in mind to sentence you to a term of imprisonment, but I have been struck by your military record."

According to the *Jewish Chronicle*, typhus is now raging in a forced labour camp recently established by the Nazis for 1,800 homeless Jews at Miechow, near Cracow. The disease is also causing havoc in Dzialoszce in the same district, where many Jews are dying every day from lack of medical aid.

A severe outbreak of plague has recently occurred in Manchuria.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

In this week's issue we print two tables for the third and fourth weeks of January respectively, and so bring epidemiological information more up to date. The outstanding feature of January has been the decline of the measles epidemic and the almost simultaneous rise in the incidence of whooping-cough. Hardly less important is the fall in the notifications of diphtheria, which, though not attended by a like fall in mortality, augurs well for the immediate future. How far recent immunization campaigns are responsible cannot yet be determined with certainty. Scarlet fever continues to increase but fatality remains low. Cerebrospinal fever and influenza deserve more detailed notice.

Cerebrospinal Fever

Notifications of cerebrospinal fever continue to increase, and it is much more prevalent than at the corresponding period last year; but the rate of increase is less steep. In the third week of January the number of administrative areas involved rose from forty-four to forty-six, and in the last week to forty-seven, appearing in five and disappearing from four. The disease was even more widespread in Wales, where eleven out of thirteen areas in the Principality were involved in the third week, but the disease appeared in three—Caernarvon, Cardigan, and Radnor—in the last week. The figures for the two weeks in chronological order for the areas chiefly affected are: Lancaster 59, 58; London 24, 22; West Riding of Yorks 18, 18; Gloucester 14, 9; Glamorgan 14, 19; Warwick 11, 13; Durham 9, 5; Middlesex 9, 2; Stafford 9, 9; Southampton 8, 7; Surrey 8, 11; Worcester 8, 4; Chester 7, 9; Kent 7, 11; Bedford 6, 2; Somerset 6, 3; Monmouth 6, 6. Notifications for the week ending February 8 numbered 345.

Influenza for Week Ending February 8

The return of deaths for the 126 great towns, 261, breaks the sequence of repetitions of the 1929 experience; then 179 was followed by 321. The ratio of 261 and 176 is almost the same as the ratio of 176 to 120, so it is very unlikely that a maximum has yet been reached, but it becomes increasingly improbable that the maximum will be of the order of magnitude of that of 1929 and not unduly optimistic to think that it will not exceed that of 1940. The age distribution of deaths is quite normal—52% over 65 and 10% under 25; the latter proportion is greater than last week, when it was abnormally low; 10% is about the usual figure. The detailed figures for London suggest that the maximum of mortality is near, that it may well be in the now current week, and that the maximum of admissions of cases of influenza, pneumonia, and bronchitis to hospital is already passed. The proportion of total deaths coming from the South-Eastern Area (including London) is still over 50%, and it remains to be seen whether mortality in the North will increase at a faster rate; but the general impression conveyed by this return is favourable.

Total of Influenza Deaths and Deaths in Age Groups in 126 Great Towns for Week Ending February 8

All Ages	A Under 1 year	B 1-5	C 5-15	D 15-25	E 25-35	F 35-45	G 45-55	H 55-65	I 65-75	J 75 and over
261	11	10	—	5	6	12	35	46	62	74

Regional Totals of Influenza Deaths for Week Ending February 8

South-Eastern Area:			Midland Area	..	28
Greater London ..	138	= 156	Eastern Area	..	3
Rest of S.E.	18		South-Western Area	..	—
Northern Area ..	..	89	Wales and Monmouthshire	..	3
			Total for 126 Great Towns, including the Outer Ring		279

Trichiniasis

In view of the recent outbreak of trichiniasis at Wolverhampton, and the occurrence of cases elsewhere, the practitioner should regard this disease, hitherto a rarity in this country, as among the febrile conditions that he may be called upon to diagnose. Prompt diagnosis is important, not, unfortunately, because there is any specific treatment, but because it is an urgent matter to trace all infected pig carcases, since the consumption of inadequately cooked pig muscle is the only way in which the disease is conveyed to man. A practitioner should always inform the Medical Officer of Health of his area immediately he encounters a case, so that the necessary inquiries may be made and the infected carcase traced. The outstanding symptoms are fever, muscular pains, and headache, often accompanied by swelling of the face, and particularly of the eyelids. During the earliest stages of the disease, when the worm embryos are maturing in the small intestine, there may or may not be gastro-intestinal disturbance and abdominal pains. Sometimes there are symptoms referable to involvement of the central nervous system. At the present season such cases may be, and have been, diagnosed as influenza. It is fortunate that a differential blood count will almost always settle any doubts, since a well-marked eosinophilia is present from an early stage of the disease.

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DEPRESSIVE STATES IN WAR

BY

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AND

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It is proposed to draw attention to the frequency of depressive states in war and to record the results obtained in an analysis of 88 consecutive cases admitted to the neuro-psychiatric unit of a Royal Naval auxiliary hospital.

The literature on war psychiatry might suggest (1) that the incidence of psychiatric disorders had greatly increased; (2) that this was almost entirely due to a greater incidence of "neurosis" of either anxiety or hysterical type; and (3) that the incidence of depressive illness was comparatively small, scarcely rising above that in the civilian population. Thus in a recently published book, *The Neuroses in War* (1940), which includes a survey of the literature, only a few passing references are made to depressive reactions; their differential diagnosis is not discussed, and even the term "depression" finds no place in the index.

Lewis (1934) has put forward the following definition of depressive illness: "A condition in which the clinical picture is dominated by an unpleasant affect, not transitory, without evidence of schizophrenic disorder (other than slight and subordinate) or organic disorder of the brain, and in which, moreover, the affective change appears primary, and not secondary to other symptoms of ill-health." If this definition is accepted a substantial proportion of psychiatric cases occurring in the Royal Navy must be classed as depressive states. Thus "depression" and "hysteria" as primary diagnoses have during recent months been made with almost exactly the same frequency (13%) in the cases (including the neurological) admitted to this particular neuro-psychiatric unit, whilst in the first part of 1940 the diagnosis of depression was three times as common as that of hysteria (Curran and Mallinson, 1940). However cases of depression may be classified the scarcity of reference to them in the literature is difficult to understand.

It is possible that reluctance to make the diagnosis of depression has arisen from the implication of "psychosis," which to so many suggests an illness of certifiable intensity. Experience in the Navy has confirmed the often-expressed opinion that the incidence of certifiable insanity is not greatly increased as a result of war stress. But it is unusual for psychiatrists to equate "psychosis" with certifiable insanity, although in view of the confusion which has arisen about this term there is much to be said for doing so. Probably most psychiatrists would still class as psychoses certain illnesses which never reached such intensity, and some of them would maintain that there was an essential qualitative as well as quantitative difference between psychosis and neurosis, which it was important to recognize because of the prognostic and therapeutic implications (Ross, 1923; Yellowlees, 1932). Reasons have been given elsewhere (Curran, 1937) why this last view should be regarded as false for cases met with in civilian practice, and it equally finds no confirmation in the naval psychiatric cases arising in this war, which seem quite clearly to form a continuous series.

The cases considered here were classed as depressive states because in all of them the depressive aspect predominated over such anxiety or hysterical features as were present. They ranged from cases of certifiable intensity to quite mild reactions showing excellent insight, a high degree of reactivity to their environment, and no evidence of such "endogenous" symptoms as retardation and self-reproach. Difficulties in making a satisfactory classification of depressive states are inherent in the nature of the material. For here again it is not a question of a sharp distinction between an "endogenous" or mainly constitutional illness and one which is "exogenous" or "purely psychogenic"—between a "manic-depressive" and a "reactive" or "neurotic" depression—but of varying proportions of constitutional predisposition and external stress. The following classification is not, therefore, intended to do more than roughly assess which of these two factors—constitutional predisposition and external stress—seemed to be the more important in the individual case:

1. "Endogenous depressions," which might or might not have been precipitated by external stress, mainly characterized by certain typical symptoms such as retardation, ideas of reference and self-reproach, and a "depressive content."

2. "Reactive depressions," mainly characterized by the dependence of the illness upon traumatic experiences which gave rise to a "topical content," but not showing the typical "endogenous" symptoms mentioned above with the same frequency or intensity.

In making the final decision each case was considered as a whole. Many cases fitted into the above classification well enough; a large number did not. By a strange chance each group was found to contain 44 cases, and of the total 33 were "regulars," 48 reservists, and 7 "hostilities only" recruits.

Method of Classification

It is now proposed to see what emerges from a comparison of the two groups and from an analysis of the findings in this series of depressive states as a whole. In order to do this the material has been summarized in

tabular form (Table I). Considerable distortion must inevitably result from the severance of particular aspects from their total and individual setting, but no other course seemed possible, for clearly we could not give full case records.

TABLE I

	Classification		Returned to Duty	Social Recovery	Reduction of Social Capacity
	Endogenous	Reactive			
No. of cases	44	44	25	40	23 (including 1 suicide)
History					
Average age	34	37.5	32	38	37
Family history of mental disorder	17	12	8	14	7
School record below Standard V	11	7	2	10	6
Bad work record	9	6	5	9	1
Unsatisfactory personality	7	8	5	9	1
History of a previous attack	16	9	5	18	2
Special war stress	8	19	6	14	7
Domestic misfortune	12	11	5	11	7
Physical factors	5	18	4	12	7
Symptoms					
Retardation	29	15	11	20	13
Ideas of reference	18	6	6	11	7
Self-reproach	27	9	8	16	12
Depersonalization	9	1	1	6	3
Somatic preoccupations	32	22	13	26	15
"Content" Depressive	37	13	14	23	13
"Content" Topical	4	27	10	13	8
"Content" Mixed	3	4	1	4	2
Anxiety	25	36	14	32	15
Reactivity	14	20	13	19	2
Hysterical prolongation	15	20	7	23	5

Past History

Family History.—Recorded only when a near relation (parent, aunt, uncle, or sibling) had been in a mental hospital, or when more than one such relation had shown unmistakable evidence of psychiatric disorder (e.g., "shell shock," or obvious psychopathy as shown by chronic alcoholism or a bad work record).

Work Record.—Recorded only when this appeared to be definitely unsatisfactory from such objective evidence as frequent changes of job.

Personality.—Recorded only when such features as well-marked hysterical or schizoid "psychopathy" or long-standing anxiety of pathological intensity were present.

Previous Attacks.—Only one patient had a previous attack of sufficient severity to necessitate mental hospital care, and in only four cases was there a history of more than one previous attack.

Special War Stress.—Recorded only when there had been a direct experience of enemy action such as torpedoing, mining, air-bombing, or immersion. The often prolonged and severe hardship and danger to which the majority of these men had been exposed has not been recorded.

Domestic Misfortunes.—All of these men had, of course, been exposed to the complications or disruption of their life entailed by active service. Details of the only factors recorded are as follows: in the endogenous group, 2 broken engagements and 6 deaths (3 mothers, 1 wife, 1 fiancée, 1 child); in the reactive group, 2 deaths (1 wife and 1 child). Justified concern over the health or behaviour of wives, the evacuation of families from bombed areas, and financial difficulties make up the remainder of the factors recorded.

Symptoms

Depression.—In all these cases the clinical picture was persistently dominated by a depressive affect as judged by general behaviour as well as by what the patients actually said.

Retardation.—Recorded only when definite and *objective* evidence of "slowing-up" was present; for complaints of difficulty in concentration and in making decisions were almost universal.

Ideas of Reference.—Recorded only when they went beyond what could reasonably be interpreted as heightened self-consciousness. They were seldom very persistent or intense, and it is probable that the expression of such ideas was often checked by the natural feeling of a disciplined man that such "silliness" should not be encouraged.

Self-reproach.—Care was taken not to record such apparent expressions of self-reproach as "I've let the side down once, and I don't feel I could go back, because I might let it down again," if such statements seemed to depend upon hysterical ("escapist") motives and were more in the nature of rationalizations than genuine beliefs.

Depersonalization.—Recorded only when persistent. It was certainly more prevalent than the figures show; for its expression requires considerable powers of accurate introspection and a lucidity of exposition which many ratings do not possess. Thus it was recorded in 4 out of 13 officer patients, but in only 4 out of 75 ratings.

Somatic Preoccupations.—Recorded only when more than a transient topic of concern.

TABLE II.—*Somatic Preoccupations*

	Endogenous Cases	Reactive Cases
Headache and head sensations	12	10
Gastric complaints	7	4
Visual complaints	5	3
Bowel preoccupations	1	3
Fear of syphilis	2	1
Fear of cancer	2	0
Genital preoccupations	3	1

The remaining somatic complaints were of "weakness," pains in the limbs, and discomfort in the throat and chest. In view of the prevalence of anxiety it is a striking fact that only one patient (an "endogenous" case) complained of cardiac symptoms.

Anxiety.—Recorded only when *objective* signs were definite and pronounced.

"*Reactivity.*"—By this was meant the response to environmental influences such as psychotherapy or occupational therapy, or the daily events in the hospital; not the degree in which the illness was consequent upon external stress.

Content.—An artificial distinction was made between those who were mainly preoccupied with traumatic experiences responsible for their breakdown and those who showed depressive preoccupations of a more generalized type. These were called "topical" and "depressive" contents, and were considered to be characteristic of the reactive and endogenous groups respectively.

"*Hysterical Prolongation.*"—Few patients are eager to return to conditions of danger and discomfort, and consequently the depressive illnesses were often complicated or prolonged by the operation of hysterical (or "escape") mechanisms.

Aetiology

The aetiological factors may be grouped under four headings: (1) constitutional, (2) physical, (3) environmental, and (4) factors related to the personality. The last group may be regarded as the end-results of the previous interaction of constitutional and environmental influences.

1. *Constitutional.*—The importance of a constitutional predisposition is shown by the fact that 29 of the cases (17 endogenous and 12 reactive) gave a family history of mental trouble, while 25 (16 endogenous and 9 reactive) gave a history of previous attacks. A family history of mental illness necessitating mental hospital care was more common amongst the endogenous group (7 cases, as compared with 3 cases in the reactive group).

2. *Physical.*—It will be seen that physical disorders were found in 23 of the patients. It is probable that all of these (except in the cases showing symptomless urinary tuberculosis and albuminuria) had some influence in the causation and prognosis of the depressive reactions. The significance, of course, varied greatly from case to case; in a few (e.g., the cases of concussion and influenza) the physical disorder was a direct precipitating cause of the breakdown. Prognostically, arteriosclerosis and head injury were the most unfavourable of

the physical factors met with, while all three of the cases which were associated with influenza made a complete recovery and returned to duty (Table III).

TABLE III

Physical Factors	Classification		Returned to Duty		
	Endogenous	Reactive			
Influenza	–	3	3	–	3
Arteriosclerosis	1	6	–	–	–
Head injury	–	4	1	–	1
Sea-sickness	1	2	–	1	1
Syphilis (not neuro-)	–	1	–	1	1
Duodenal ulcer	1	–	–	–	–
Alcoholism	1	1	–	–	–
Urinary tuberculosis	–	1	–	1	1
Albuminuria	–	–	–	–	–
Fractured scapula	–	–	–	–	–
Totals	5	18	4	3	7

3. *Environmental.*—The main environmental [illegible] which these men had been subjected were [illegible] home life, representing in the case of many [illegible] removal of a recently earned reward which has been deferred although keenly anticipated, during their careers in the Services; (*b*) bereavement or other domestic misfortunes which [illegible] hard enough to bear in peacetime, were sometimes found to be intolerable under the conditions of separation and limited [illegible] prevailing in wartime; and (*c*) prolonged exposure to danger and discomfort; and in 27 cases (8 endogenous and 19 reactive) personal experience of a naval disaster, such as mining, torpedoing, and air-bombing, often involving the deaths of messmates and friends.

4. *Personality.*—It will be seen (Table I) that in only 15 cases (7 endogenous and 8 reactive) was the personality considered to be unsatisfactory or "psychopathic." Further information about the personalities of these patients is given in Table IV.

TABLE IV

Recorded in Table I

Endogenous Group	Reactive Group
3 hysterical psychopaths 2 schizoid psychopaths (one of them described by a colleague as "a schizoid sour grape") 1 reformed alcoholic 1 chronic hypochondriac	7 hysterical psychopaths 1 constitutional inferior

Not Recorded in Table I

10 excellent personalities 6 conscientious personalities (3 of them also "dull") 12 simple or "dull" personalities (3 of them also conscientious) 6 of a sensitive worrying type	11 excellent personalities 5 conscientious personalities 11 simple or "dull" personalities (5 of them also conscientious) 10 of a sensitive worrying type (5 of them also conscientious)

The majority were worthy, strikingly conscientious, self-disciplined men of a rather dull, unimaginative, plodding type who had previously stood up well to their responsibilities and the demands made upon them by their lives. But they were not men who were highly endowed with initiative and enterprise, and those very qualities which had made them trustworthy workers of a routine type made it difficult for them to adapt themselves to the altered conditions entailed by active service in wartime, away from their homes and the set ways which meant much to them. Moreover, in 18 cases (11 endogenous and 7 reactive) a significant degree of mental backwardness tended to increase their difficulty in adaptation. Finally, the average age of the group was notably high, and, presumably owing to their hard life, ratings are often old for their years.

In Table V the age incidence of these depressive cases is contrasted with that in a parallel series of 63 hysterics.

TABLE V

	No. of Cases	Under 25	25–35	35–45	Over 45	Total Under 35	Total Over 35	Average Age
Depression	88	12.5	25.0	46.5	16.0	37.5	62.5	36
Hysteria ..	63	43.0	27.0	25.5	1.5	70.0	30.0	29

The difference in the categories, as well as in the age incidence, is also informative, for only 7 of the depressive cases were "hostilities only" recruits, compared with 20 "hostilities only" recruits in the hysterical series. Again, 13 of the depressive cases were officers, and only 1 of the hysterics. In summary it seems reasonable to conclude that the depressive cases were for the most part excellent men, who finally broke down not through any deficiency in morale but largely owing to certain deficiencies in adaptability, due to a number of causes—their age, their temperament, and, in quite a high proportion, incipient backwardness or arteriosclerosis.

Results

The results obtained are given in Table VI. It will be seen that approximately 28 % returned to duty and that only 2 % showed on discharge any significant reduction in their previous social capacity, not more than five cases needing further hospital care. When it is considered that the duration of stay hardly ever exceeded three months and that most of the cases were in hospital for a shorter period, these results are very good. Nor can this be wholly attributed to mildness, for the majority showed a reaction which at some time was of considerable severity. The "reactivity" of these cases was therefore a very striking phenomenon.

TABLE VI

	Endogenous	Reactive	Average Duration of Illness (excluding 2 Patients with Illness of 7 Years)
Duty	12	13	4.1 months
Recovery with little or no reduction of social capacity	19	21	6.9 "
Improvement with some reduction of social capacity ..	7	10	6.7 "
Certified	4	0	
Voluntary patient	1	0	
Suicide	1	0	

Prognosis

The aetiological considerations mentioned above may help to explain the prognostic findings. In attempting to assess prognosis each case must of course be studied individually: the remarks which follow can only be regarded as broad generalizations.

The patients who returned to duty tended to show (Table I) those attributes which are associated with adaptability, such as relative youth, intelligence, and, above all, a plastic and resilient temperament. (This last attribute does not lend itself to a tabular record and hence has not been shown.) Thus it is not merely a coincidence that the proportion of officer patients who returned to duty was high (8 out of 13 cases). Indications of stability, such as a steady work record and "conscientious character," had some prognostic value, but were too apt to be combined with that rigidity and deficiency in adaptability already described. Turning to the illness itself, a duration of less than six months (Table VI) and symptoms of relatively mild intensity (especially if following some physical illness such as influenza) were favourable signs, but the most valuable of all seemed to be the degree of rapid "reactivity" that was shown.

Conversely, few returned to duty who had a poor school record or an illness lasting more than six months, especially if of a severe character. It will also be observed that a large number of those who, although unable to return to duty, made a good social recovery showed symptoms of hysterical prolongation; the early appearance of such symptoms makes an ultimate return to duty less likely. They often diminished or disappeared when the man knew he would be invalided.

The family history, special war stress, and domestic misfortune seemed to have less influence upon the prognosis than might have been expected. Nor did the presence of somatic preoccupations appear to make much difference, unless of a gross depressive type (e.g., "testes rotting") or associated with other symptoms indicating an illness of severity.

In the tabular records few differences can be seen between those cases which made a good social recovery and those which did not, with the striking exception of the lack of "reactivity" shown by the latter group. In dealing with war cases, which typically respond so rapidly, persistent unresponsiveness to environmental influences should therefore lead to prognostic reserve. It is sometimes possible, however, from a more detailed knowledge of the individual case, to suspect the reasons for an unsatisfactory social outcome. Thus some active service ratings (or "regulars") find themselves in a psychological impasse: they cannot face a return to duty, while invaliding leads to the termination of their careers. Again, it is embarrassing for a proud man to be invalided from the Service if he has no symptoms to show for it when he goes home. Finally, prolonged illness may occur, just as in peacetime (especially when arteriosclerosis is present).

Treatment

The same general principles must be applied to the treatment of these cases as are employed in all depressive states. They need not be recapitulated: an excellent account will be found in Diethelm's book (1936). Brief mention will only be made here of two aspects.

1. *Continuous Narcosis.*—The onset in these cases had usually been insidious. This is not surprising in view of the type of personality which has been found to be characteristic, and which is perhaps one of the conditions of their development. For individuals lacking the same conscientiousness or of a less robust temperament tend either to succumb to affective reactions at an earlier stage, before the more definite symptoms of depression become manifest, or escape by the development of hysterical illnesses before affective symptoms become manifest at all. Only one patient (the captain of a ship which was sunk by enemy action, not included in this series) has so far come under observation who, previously free from symptoms, developed a profound self-reproachful depression almost overnight after the catastrophe. It can therefore scarcely be expected that continuous narcosis should have the same value as in certain acute reactions of recent origin, like those described by Sargant and Slater (1940) in soldiers after Dunkirk. More restricted claims must be made for its value in depressive states and all results be reviewed in the light of the fact that these cases do very well without it. It would, however, be foolish to deny its value for more recent cases with much anxiety. The same arguments apply to the various forms of "shock therapy," which are further complicated by the possibility of fractures and dementia (Tooth and Blackburn, 1939).

2. *Psychological Treatment.*—The two main ways in which these cases differ from those met with in civilian practice are: (*a*) their "reactivity," and (*b*) the strong incentive that is present to hold back from complete recovery, which with few exceptions means a return to those conditions of stress responsible for the breakdown; for it is unusual to encounter a patient whose illness is totally unconnected, either directly or indirectly, with war service.

The first point—the reactivity—provides ample scope for psychological treatment, meaning by this both psychotherapy and individual psychological management within the framework of a regime of "occupational therapy" organized on the lines recently so well described by Cameron (1940). Skill is required in planning the patient's day according to his needs and capacity, and attention to apparently minor points, such as what patients should be in neighbouring beds, can make an important contribution. Mapother (1936), speaking of the acute anxiety states in the last war, has said that, without glorification as heroes, such patients needed and deserved all the sympathy and reassurance that could be given to them. The same holds true in equal measure for these states of depression. Perhaps the essence of psychotherapy in all affective reactions is to induce the patient to accept and to interpret his symptoms as evidence of illness entailing both restrictions and responsibilities, and those who suppose that the psychotherapy of depressions can be summarized in the formula of "*simple reassurance*" *make a profound mistake.*

The second point—namely, the danger of hysterical developments and prolongations—makes treatment even more difficult. These developments are natural enough in a man who has been severely ill, has rightly been reassured that he has been ill, has interpreted this as in some sense a moral absolution, and knows very well that a full recovery will mean a return to conditions of danger and stress. It is difficult, but most important, to try to judge when a psychobiological reaction of depressive type is being replaced by hysterical manifestations, and to reinforce sympathy with the firmness that is then called for. The dangers of retention in hospital must therefore be balanced against those of a premature discharge, but it is perhaps better to risk the relapse which may follow too rapid a return to duty, or to civilian life after invaliding, than the invalidism that may follow prolonged hospitalization. Nothing can be worse for some patients than uncertainty as to whether they will be invalided or not, and it is well to make as rapid a decision as possible.

Discussion and Conclusions

The facts put forward do not reveal any fundamental and clear-cut distinction between the endogenous and reactive groups, and had it been possible to demonstrate the cases, or even to give full case records, it could have been shown more convincingly that these depressive states formed a continuous series. The point is of some importance, for it is still often supposed that the question, "Is this case of depression of a psychotic or neurotic type?" necessarily permits of a categorical answer with important and definite prognostic and therapeutic implications (the "psychotic" depression being essentially a constitutionally determined reaction which runs its predestined course to ultimate recovery unaffected by any environmental influences, including psychotherapy; the "neurotic" depression, on the other hand, being essentially psychogenic and unlikely to recover without psychotherapeutic intervention). This is not so. Certain cases at each end of the endogenous–exogenous scale do more or less fulfil these criteria; such cases, however, are not separated by a sharp borderline but by a wide borderland. In brief, it is held that the classification adopted possesses meaning only as indicating towards which end of a continuous series (the extreme ends of which certainly differ widely) a given case belongs.

Similarly, there is an indeterminate zone where the question whether a given case should be classed as a depressive state with anxiety features or an anxiety state with depressive features is merely a matter of taste. Such mixed reactions shade off into "pure" anxiety states without any obvious features of depression at all.

A distinction which is justified on clinical and therapeutic grounds can, however, be made between "affective disorders," comprising cases in which either the mental and physical symptoms of anxiety or depression is the main feature, and hysterical reactions, in which "mental and physical symptoms not of organic origin are produced and maintained by motives, never fully conscious, directed at some real or fancied gain to be derived from these symptoms." (M.R.C. Report of Committee on Head Injuries—private information, unpublished.) The symptoms in the affective group are reactions of the whole organism in a way in which hysterical reactions are not. Thus physical symptoms the involuntary accompaniments of emotional disturbance, such as loss of weight and tachycardia, are to

be found. Some of these symptoms may be *biologically* purposive, but they are of a type which cannot be imitated voluntarily, have acquired a certain autonomy of their own which cannot be abruptly terminated by changes in the environment, and, as some might say, are outside the patient's control.

To suppose that all affective reactions (i.e. states of anxiety and depression) are of an "escape" type and *personally* purposive would be both to overvalue psychogenesis and to confuse it with hysteria. It is of course true that the two types of reaction—affective and hysterical—may coexist: the readiness with which a given patient will succumb to or will utilize in a hysterical way the symptoms of an affective disorder will vary. Certainly many patients do so; or are not able or willing to part with an affective reaction—especially the visceral components, which in themselves are not more severe than those experienced by other men who do not succumb. These are, no doubt, the causes of the incapacity produced by many so-called "organ neuroses," such as certain of the "functional dyspepsias" so common in the Services.

On the whole, therefore, it would seem more important to try to determine the presence and assess the intensity of genuine affective symptoms and to contrast this with the presence or absence of hysterical features rather than to contrast neurosis and psychosis. For the treatment of a predominantly affective reaction does differ fundamentally from that of hysteria, as does the type of personality that tends to be affected.

Broadly speaking, it may be said that the better type of individual, with a high sense of duty and morale, if he develops an illness as a result of war stress, will tend to develop an affective reaction. It is significant that many of these men did not report sick but were sent sick. The severity of the total psychobiological reaction to a given stress is presumably dependent mainly upon the constitutional predisposition, and severe depressive illness will only occur in the predisposed. On the other hand, men with a less strict sense of duty and lower morale tend to escape by the development of "pure" hysterical reactions or succumb to "affective" symptoms of relatively minor intensity. Consequently, assessment of the relative proportions of affective and hysterical features is of great importance in determining how much firmness should be shown, the possibility of a good response to semi-disciplinary measures, and whether a man should be kept at duty or not.

The group of cases that have been studied lie towards the depressive end of the scale of affective disorders. The type of personality in which these depressive reactions commonly arise and the constitutional, environmental, and physical factors which contributed to their development have been described. It has been noted that the majority of the patients, although showing symptoms of a constitutional or "endogenous" type, responded rapidly to environmental influences in hospital. This reactivity, although valuable from the point of view of therapy and a rapid recovery by civilian standards, increases the likelihood of relapse on return to active service. It does, however, serve to belie the attitude of therapeutic nihilism which is so often adopted towards patients who are wrongly thought to show a "purely endogenous illness."

Summary

Attention is drawn to the frequency of depressive states in war, which during the latter part of 1940 formed 13% of all admissions to a naval neuro-psychiatric unit.

The results obtained from the analysis of a series of 88 consecutive cases are recorded. No justification for a sharp and clearly cut division into "neurotic" and "psychotic" types could be found.

It is put forward that a more fundamental distinction would be between "affective disorders" (cases in which the mental and physical symptoms of either anxiety or depression, or both combined, are the main features) and hysterical reactions (in which the "escape" element predominates). Consequently it is more valuable to try to determine the presence and assess the intensity of genuine affective symptoms, and to contrast this with the presence or absence of hysterical features, than to contrast neurosis and psychosis. This is because the treatment of a predominantly affective reaction does differ fundamentally from that of hysteria, as does the type of personality that tends to be affected. As has been pointed out, the *proportion of firmness to sympathy should vary in direct* relation to the hysteria that is present in war cases; and, conversely, it is senseless to try to "keep in the firing line" genuine and severe affective states.

It was found in this series of cases that men of a fine type and excellent morale, but who for various reasons were deficient in adaptability, were, as the result of prolonged stress, prone to develop reactions which lay at the depressive end of the affective series. These depressions differed from those met with in civilian life by their rapid reactivity and better outcome. Thus, after a brief period of treatment, 25 patients (29%) were able to return to duty, and only 5 cases (6%) needed further hospital care. The prognosis and treatment of depressive states in wartime are discussed.

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GENERAL PRINCIPLES OF TREATMENT OF AIR-RAID CASUALTIES*

BY

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I must confess to a feeling of diffidence in dealing with the subject of the treatment of air-raid casualties, as owing to my administrative Army work I have had little opportunity of first-hand experience except during the period I was in Norway. I have, however, discussed the subject very fully with many colleagues from various hospitals who have considerable experience as surgeons under the E.M.S. in London and elsewhere, and am largely indebted to them for what I have to tell you.

Before proceeding to discuss the principles of treatment it is well to consider certain facts arising from experience in air raids on our cities, and the first and most outstanding fact is the small number of casualties compared with what was anticipated. Again, it is noteworthy that though the proportion of killed to wounded (I think seriously wounded only) is high—approximately one to two—the vast majority of those wounded suffer from very slight multiple wounds requiring no skilled surgical intervention, while of the seriously injured many are too ill to be helped by surgical skill. Thus the scope of surgery in air-raid casualties is very limited, though where it is justifiable it is often life-saving.

Head wounds are but seldom met with, though there is a most distressing, and all too frequently not fatal, injury—knocking away of part or even the whole of the face by bomb fragments owing to the victims not having

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thrown themselves *ventre à terre*. Therefore, when you hear bombs falling in your neighbourhood, forget your dignity and fall flat!

Principles of First Aid

First aid is performed on the spot by the first-aid squads, and very well they do it, too—with courage and without regard to the danger of falling shrapnel, bombs, and masonry. If I may be permitted one criticism of their work it is a tendency to take too long in carrying out unnecessarily elaborate first aid and bandaging, when it is far better for the victim to be treated quickly and conveyed as rapidly as possible to the warmth and cover of the hospital receiving-room or first-aid post. Arrest of haemorrhage, usually efficiently achieved by a pad and bandage, and the very rough splintage of fractures are all it is desirable to achieve "on the field." Tourniquets are seldom necessary, but if applied the doctor's attention should be drawn to them immediately the patient reaches hospital or a first-aid post.

I would bring the foregoing points especially to the notice of those who give first-aid instruction, and urge that these be impressed on their workers, as also the necessity of undressing victims as little as possible and keeping them warm by wrapping them up in blankets immediately the wound is dressed, thus minimizing exposure and wound shock (collapse). Another point I wish to stress is the necessity for training the squads to work in the dark or by the flickering light of a candle or the uncertain gleam of an electric torch; and, finally, the necessity for being able to do all this in a gas mask.

Reception of Wounded

It is my considered opinion that all cases should go to the reception-room of a hospital and there be seen and sorted by an experienced medical practitioner or surgeon. As stated, many of these cases receive multiple and apparently trivial wounds; and therein lies grave danger, for a cursory examination or an inexperienced eye may pass as superficial a small deeply punctured wound or be deceived by the apparent well-being of a patient with internal injuries, with serious and often fatal results. Lately I have seen two cases illustrative of this. In one of these a patient sent home from a first-aid post with multiple small and apparently superficial wounds died two days later from acute septic meningitis due to a fragment which had penetrated the brain through the left upper eyelid and orbital plate. In the second case a soldier, after bomb injury, walked a mile to the doctor and complained of a sinking feeling, which was attributed to a very natural fright. He was told to walk home, and later was found gasping, pale, and pulseless by the roadside. Subsequent operation revealed rupture of the liver and spleen, the result of blast. Too much stress cannot therefore be laid on the importance of careful but rapid sorting, or triage, as it is now fashionable to term it; and for this to be done efficiently experience and some system of coloured tabs is essential, so as to ensure precedence for cases of haemorrhage, open chest wounds, burns, etc.

Wound shock needs treating early and efficiently, and, though in mild cases warmth, rest, and hot sweet drinks may suffice, the addition of 1/4 to 1/3 grain of morphine is a valuable adjunct, while in all more severe cases blood transfusion, or serum or plasma transfusion in the case of burns or shock without wounds, is beneficial, and is expected by the lay public. Remember to rest such cases after treatment for at least half an hour before evacuation and do not usually give more than one pint of blood. Occasionally in severe cases a second given very slowly may be beneficial: the rate and volume of the pulse are the best guide to its necessity.

Team-work.—Here, as in all things, I wish to emphasize the value of team-work in ensuring the maximum of efficiency in the minimum of time—most essential in the rush of dealing with casualties in air raids, unless a "block" is to be created. Those concerned with stretcher-loading and unloading from ambulances, members of the refreshment department, the clerks, blood and burn and fracture teams, operating theatre staff, etc., must all be trained to work together, and if a particular worker is disgruntled or out of tune with his colleagues replace him (or her) at once.

Treatment of Special Injuries

The injuries met with include many varieties of wounds from bomb fragments and flying glass, crush accidents from falling masonry or burial under ruins, blast injuries, and burns from various sources.

Bomb Wounds.—These if bad lead to fatal results either directly or from their severity, such as in avulsion of an entire limb or evisceration; the majority of the remainder may be very slight and take the form of peppering with multiple small fragments, though of course injuries from medium-sized fragments are met with. It is obviously impossible to excise many small wounds, as the result would for practical purposes be a flayed patient. Such wounds must be more carefully examined to ascertain that no body cavity has been penetrated, and if any doubt exists, that particular wound must be excised and explored; otherwise the whole must be cleaned thoroughly and dressed with acriflavine or crude cod-liver oil ointment. No re-dressing should be carried out for at least ten to fourteen days, when healing will be found to have occurred in most cases. It is advisable to give sulphanilamide as a prophylactic against sepsis for the first four or five days.

Glass wounds may be very severe and deep, and are generally multiple. Sharp fragments will penetrate the skull and traverse the body cavities, doing as much harm to viscera as do bomb fragments.

Fractures are mostly of the open variety, and must be dealt with by free excision of the wound and fixation of the limb either by plaster-of-Paris or suitable traction apparatus. Much has been written about plaster-of-Paris as an immediate dressing. It is generally agreed that the results are good if the patient can be kept under observation for some days where the operation has been performed. Danger lies in infection and oedema under the plaster, causing gangrene of the limb: it is a very real danger, and if the patient is put in plaster this must be bivalved before evacuation. No one can say how long any patient will be in the ambulance, and there is not means to remove plaster on the journey. All fracture cases should be transferred as early as possible to special hospitals. As a general rule, for first aid all lower-limb fractures should be put up in a Thomas splint, and upper-extremity ones treated by Cramer's splinting and binding to the trunk for transport.

Thoracic Wounds.—Open pneumothorax must be closed at the earliest opportunity if death is to be averted. As a first-aid measure a large pad and a tight bandage must be applied at once and the patient be immediately removed to hospital, where very early operation is to be undertaken to cleanse the thoracic cavity and close the chest wall: such steps should precede any attempts at resuscitation. *Haemothorax*, not infrequently seen after blast and crush and through-and-through injuries, is best treated conservatively by rest and morphine, unless cyanosis or restlessness denotes respiratory distress, when aspiration must be performed promptly, and be repeated if necessary. Should subsequent infection ensue operative intervention will be carried out.

Abdominal wounds call for no special comment, save for the reminder that perineal or buttock wounds should be regarded with grave suspicion and the abdominal cavity be opened if any doubt is entertained that it may be perforated.

Treatment of Burns

Burns are common and are usually very severe, so that fatalities are frequent from this cause. Recently there has been great controversy as to the best method of treatment to employ; but, though I may be biased, I still think some form of tanning gives the best results and is most generally applicable. Shock is very severe in these cases, and needs prompt and thorough treatment both as a first-aid and as a resuscitant measure. Inasmuch as haemoconcentration can be demonstrated in these cases, transfusion of plasma or concentrated serum is preferable to whole blood, but the latter should be given if the others are not available. The fluid must be transfused slowly, as there is grave danger of fatal pulmonary oedema (for which reason intravenous saline is absolutely contraindicated), and may be repeated at intervals for the first few days—preferably by the drip method. The procedure is by no means easy in extensively burned patients, as superficial veins are not only hard to find but have a tendency to clot readily. As a first-aid measure tanning should be carried out promptly either by coating with tannafax or by applying a compress soaked in tea to the burnt area without any previous attempt to clean it other than removing charred clothing. It is a generally admitted fact that cases so treated remain fitter and suffer far less subsequent collapse. Hot sweet drinks and morphine should be given and the patient warmly wrapped and, if feasible, left lying quiet for half an hour before being evacuated in the ambulance.

At hospital, after treatment of the shock, scrupulous surgical cleansing of the burn, and, most important, the skin at its edges and six inches beyond, must be carried out promptly under anaesthesia, and all blebs opened and dead skin removed. Morphine alone is seldom sufficient in the rush, and can be supplemented safely by gas-and-oxygen anaesthesia; ether is too prone to cause pulmonary complications, and chloroform is too toxic to the damaged liver cells. Pentothal may be used in slight burns, but it is not always safe in severe ones owing to liver and kidney cell damage. Personally I now use a tannic acid compress, except for face, neck, and perineal burns, in which cases 1% aqueous gentian violet or powdered sulphanilamide is employed. Others, however, tan with silver nitrate and tannic acid, brilliant green, or albumin; while some apply cod-liver oil. Wakeley, Fleming, and Bunyan advocate warm saline-and-hypochlorite baths from the first, and the last-named has made ingenious silk casings to enclose the burnt areas so as to allow of frequent flushing over.

Lately there has been discussion on burns of the hands and fingers, it being claimed that tannic acid dressings cause necrosis and undue deformities. I can only say that in my experience I have not met these disasters. Necrosis subsequent to severe burns is not infrequent in the finger pulp, which often seems normal in appearance at first, and I suspect this may be responsible for the alarm and despondency of some of my colleagues. If this calamity is feared from the use of tannic acid then I suggest 1% aqueous gentian violet or even the saline baths advocated, though these are hard to manage except in a properly equipped hospital.

It will be seen that there is a good choice of methods of dressing burns. I cannot here discuss their merits or demerits; suffice it to say that as much care must be taken in preliminary cleansing as in wound excision; for this is essential if a good result is to be obtained. In any case, owing to the great tendency to sepsis, it is advisable to give sulphanilamide from the first for four or five days, and if the patient is vomiting it can be injected.

Sulphonamides

I may be expected to say something about the use of sulphanilamide and the sulphonamide group of drugs. It is my considered opinion that these drugs in some form—and personally I think prontosil is as good as any, and certainly as cheap—should be given for the first four or five days in all cases of wounds and burns, as it seems that the chances of sepsis supervening are then greatly diminished and its virulence lessened should it occur. The drug can be given by mouth in doses of 2 grammes thrice daily—increased to four-hourly if sepsis appears—and for the first twenty-four hours in warm lemonade or citric acid solution so as to increase the rapidity of its absorption into the blood stream. If this be done there is seldom necessity for intravenous or intramuscular injection of expensive forms of the drugs, such a procedure being reserved for cases with severe vomiting.

Toxic effects must of course be watched for, especially leucopenia, and their appearance calls for prompt cessation of the drug's administration. Local application to wounds in the form of a pack is popular with some surgeons, from 5 to 15 grammes being employed—never more: but only in exceptional cases does this seem likely to have any advantage over prompt oral administration, as the drug has no local action on the wound. As a dressing for burns of the face and perineum powdered prontosil has its advocates and uses: but here again a word of warning is necessary regarding the quantities it is safe to employ for this purpose.

EXPERIMENTAL HUMAN SCURVY

NOTES ON A REMARKABLE STUDY REPORTED BY CRANDON, LUND, AND DILL

BY

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The following summary of an experiment carried out by a group of American investigators throws new light on the functions of vitamin C in human nutrition and on the problem of scurvy. It is of interest to compare and combine the results obtained with those reported by Fox, Dangerfield, Gottlich, and Jokl (1940).

Crandon, Lund, and Dill (1940) asked themselves the question, How long does it take a healthy adult to become scorbutic when fed on a diet otherwise fully adequate but entirely devoid of vitamin C? Crandon set to work to obtain an answer by experimenting on himself. The experiment was very carefully planned at the Medical School, Harvard, and was undertaken in close co-operation with several associated organizations and laboratories. This not only made it possible to carry out an extensive series of observations, but analyses were also duplicated by different observers and other valuable checks on the findings became practicable.

Crandon's Experiment

A normal active adult male placed himself on a vitamin-C-free diet, supplemented by all the other known dietary constituents, for a period of six months. The diet for the last four months consisted of bread, biscuits, cheese,

eggs, beer, black coffee, and a special chocolate; at the same time he received 30,000 I.U. of vitamin A, 132 I.U. of vitamin B_1, 80 µg. of riboflavin fortified by 10 Harris yeast tablets, 50 mg. of nicotinic acid, 5,280 I.U. of vitamin D, and, after the second month, 4 c.cm. of wheat-germ oil. Samples of blood were repeatedly tested in many ways, and numerous other means of investigating the response to the diet were found. The findings in this state of pure vitamin C deficiency—i.e., in the absence of factors such as multiple avitaminoses, infection, growth, or other stress—were as follows:

1. *Physical Findings.*—During the first four months all the physical findings were negative. There was, however, a fall in weight and a slight lowering of the basal metabolic rate, together with a feeling of easy fatigability and slight weakness.

2. *Loss of Weight.*—The subject experienced a gradual and continual loss of weight, which reached a maximum of 27 lb.—i.e., a loss of over 1 lb. a week. This was attributed to the type of diet that had to be employed rather than to the absence of vitamin C. No gain in weight was observed at the conclusion of the experiment when the subject received vitamin C though remaining on the same diet.

3. *Capillary Fragility.*—The Göthlin, Dalldorf, and Rumpel-Leede tests for increased capillary fragility were all negative, even in the presence of frank scurvy. While remarking that it must not be concluded from this that capillary fragility can be excluded as part of the underlying pathology of scurvy, it is pointed out that these tests must be regarded as poor indices of subclinical scurvy, even though in some cases petechiae may be produced which clear up on ascorbic acid therapy.

4. *Blood Chemistry.*—(*a*) The plasma ascorbic acid level rapidly fell and reached zero after forty-one days on the diet, remaining at this level *for thirteen weeks before the first evidence of clinical scurvy was manifest.* (*b*) The vitamin C level in the white cell platelet layer of the centrifuged blood fell gradually from the normal level, but did not reach zero until shortly before the appearance of clinical scurvy. (*c*) In spite of the nature of the diet and the loss of blood (estimated at over 6,000 c.cm. removed for various tests and during the operations) no anaemia developed. (*d*) The white cell count remained between 3,200 and 5,000 per c.mm. during the latter part of the experiment. The slight fall observed was not regarded as significant for this individual. (*e*) During six months of total deficiency and after a month of clinical scurvy the blood complement titre still remained normal.

5. *Resistance to Infection.*—There was almost complete freedom from respiratory infection throughout the experimental period, which included the winter months; in previous winters it had been not uncommon for the subject to suffer from frequent severe upper respiratory infections. This is thought to raise doubt as to whether vitamin C deficiency *per se* is an outstanding factor in lowering the resistance of an adult.

6. *Skin Lesions.*—(*a*) *After 134 days* had elapsed small perifollicular hyperkeratotic papules began to develop over the buttocks and the posterior aspects of the calves; there was also noticeable fragmentation of hairs. Each papule contained an in-growing hair, which could be seen if the hyperkeratotic plug was picked or scraped off, leaving a small slightly bleeding crater. Associated with these papules was a marked dryness of the skin, particularly over the extensor surfaces, and the backs of the hands became decidedly roughened, the pores standing out in exaggerated fashion. It is suggested that these hyperkeratotic papules may be the first signs of vitamin C deficiency. (*b*) *After 161 days* of the diet there appeared for the first time small perifollicular haemorrhages or petechiae over the lower legs. They seemed to occur in greatest numbers after the subject had been standing for some considerable time.

Following the administration of vitamin C all the skin lesions rapidly cleared.

7. *Teeth and Gums.*—(*a*) *At the end of the first five months* of the experiment a competent dentist pronounced the gums to be normal in appearance. (*b*) *Three weeks after the appearance of clinical scurvy* the gums were found to be slightly more boggy than usual, but no other gross changes could be seen. A biopsy of the gingiva was absolutely normal. However, radiographs of the teeth showed occasional interruptions of the lamina dura, and it is suggested that such *x*-ray pictures may be one of the better diagnostic criteria in early scurvy. At no time was there a trace of bleeding on brushing the teeth.

The lack of changes in the gums and teeth during the entire period of this experiment raises the question whether those commonly described as typical of scurvy may not, at least in part, be due to pre-existing or superimposed gingivitis or dental caries, or both. Supporting this hypothesis the fact is recalled that in edentulous scorbutic patients no gingival changes are commonly seen.

8. *Fatigue.*—A feeling of fatigue and weakness was first noticed at about the end of the third month, and became progressive as time went on. Careful tests at the Fatigue Laboratory indicated that after prolonged vitamin C deficiency there was impaired ability to perform *aerobic* work—e.g., walking and running on the treadmill. However, no great change could be found in the capacity for performing *anaerobic* work—e.g., in the muscular activity of the forearm as measured by an ergograph, both for single contraction and for contractions each second to exhaustion. Tests of moderate work (walking at 3.5 miles an hour) and a harder grade of work (a run to exhaustion at a rate of 7 miles an hour) were also employed. In the latter test the subject was able to run for only sixteen seconds when in the scorbutic state, whereas while on the same diet but when receiving daily injections of 1 gramme of ascorbic acid he ran for sixty-six seconds. It is stated that the performance while in the scorbutic state placed him in the category of men in the eighth decade of life, for whom a five-minute walk is maximal work. Another point of considerable theoretical interest was that after a period of aerobic work in the scorbutic state the rate of disappearance of the blood lactate was abnormally slow.

Attention is drawn to the possibility that extreme muscular exertion may deplete the body of the vitamin more rapidly and that scurvy might have appeared much sooner if the experimental subject had been constantly submitted to extreme muscular fatigue. Within twenty-four hours after the administration of ascorbic acid at the conclusion of the experiment a considerable alleviation of weakness and languor was noticed, but it is pointed out that part or even all of this improvement might have been due to suggestion.

9. *Wound Healing.*—These results are of the very greatest interest. (*a*) *At the end of three months* a sizable wound was made in the right mid-back of the subject. Approximately 2 grammes of the sacrospinalis muscle was removed for analysis and found to contain no vitamin C. In spite of this biopsy the wound ten days later showed good healing as compared with a normal control similarly treated but on an abundant supply of ascorbic acid. Moreover, histological study of the experimental subject's wound showed ample intercellular substance and capillary formation. (*b*) *At the end of 182 days*—twenty-one days after the petechiae had become apparent over the lower limbs—a similar wound was again made in the left mid-back. Healing appeared to progress normally, but on the tenth post-operative day a biopsy was made, and it was found that beneath the skin, which appeared well healed, there was no healing of the wound, which was filled with unorganized blood clot. Sections of this wound showed a lack of intercellular substance and capillary formation, as has been found by Wolbach in the wounds of scorbutic guinea-pigs. It was because of this finding that the experiment was discontinued and the subject was given a daily injection of 1 gramme of ascorbic acid though remaining on the same diet. After several days of vitamin therapy another biopsy showed good healing, with ample intercellular substance and capillary formation.

10. All the signs and symptoms of scurvy rapidly disappeared following the intravenous injection of ascorbic acid.

11. *Daily Requirements of Ascorbic Acid.*—After the beginning of treatment with ascorbic acid it was found from urinary excretion tests that from 4 to 6 grammes was required to resaturate this individual. Since the first signs of scurvy

appeared after 132 days of total vitamin C deficiency it was concluded that the maximal daily utilization of this vitamin lies between 30 and 45 mg., though it was suggested that the true requirements may lie somewhat below this figure.

In conclusion the authors express the opinion that the long interval that elapsed before clinical scurvy made its appearance is probably due to the absence of any complicating factors, such as growth, infection, or multiple avitaminosis. They also remark that, apart from being a prerequisite for the formation of intercellular substance, the part which vitamin C plays in the physiology of the human organism remains conjectural; however, certain findings, such as the abnormal blood lactate values obtained after exertion, may serve as leads for further investigation.

Comment and Comparison with our Findings on Native Mine Labourers

The remarkable nature and practical importance of this study will have been appreciated from the foregoing summary. Not only does it illustrate the possibilities now becoming available for isolating the part played by a single vitamin, but the fact that the experimental subject was a healthy human being and not a laboratory animal gives the findings great significance.

Comparing these results with those gained from our own study of native mine labourers, it will be seen that the two are complementary in a very interesting way. We studied for seven months nearly a thousand healthy men on a low but not entirely deficient daily intake of ascorbic acid. The American investigators studied intensively for six months one healthy man on a diet totally devoid of this vitamin. The results of the two studies may be compared and combined as follows:

(*a*) Total deficiency failed to produce clinical symptoms of impaired health over a period of three months, during which time the subject was draining upon his stores of vitamin; in our case a low daily intake gave equally negative results over a period of seven months in individuals who were shown to have very low initial reserves of vitamin.

(*b*) In neither case could any increase in capillary fragility be detected by the usual tests, even when frank scurvy had developed.

(*c*) Determination of the ascorbic acid level of the blood proved of no help in relation to the clinical findings. With total deprivation it rapidly fell to *nil*; with partial deprivation it remained at such low levels that they could be detected only with difficulty. Yet in neither case was there any clinical indication of ill-health.

(*d*) There was no indication that a deficiency of vitamin C leads to the development of anaemia.

(*e*) In both investigations the gums remained healthy throughout.

(*f*) There was no indication that resistance to infection had been diminished by the reduction in the intake of vitamin C.

(*g*) In both experiments gross diminution in the amount of vitamin C provided in the diet revealed no impairment in the healing of wounds. In fact, no less than six months of total deprivation was required to bring about such impairment.

(*h*) This demonstration that deprivation of ascorbic acid, unless extremely severe and prolonged, does not of itself lead to the appearance of scurvy in the absence of precipitating factors supports the conclusion already arrived at by Hess and others. It is also strikingly borne out by our findings, since only twelve out of our large groups contracted the disease, though all were on the same long-continued and low daily intake of vitamin.

(*i*) It will be noted that it took no less than three months of complete deprivation of dietary vitamin C to produce a feeling of languor and incapacity for strenuous work; and even this may well be partly accounted for by the considerable loss of weight associated with the diet used. It is surely of significance here that no similar indications were obtained with our subjects when living for so long on such a low daily intake. Still more significant was our finding that scurvy did not develop either more quickly or more often among those engaged on really strenuous work. While it will be agreed that frank scurvy is characterized by pronounced languor and incapacity for work, both studies appear to indicate that the intermediate stages are not so characterized. Indeed, it seems somewhat curious that modern writers lay so much emphasis on hard work as a predisposing factor in the precipitation of scurvy. This was not the view of the classical students of the disease. Thus Hess (1920) writes: "Lind and others repeatedly emphasize the fact that the indolent and slothful sailor was stricken with scurvy far oftener than the one who was active, and claimed that physical exercise even tended to bring about a cure."

(*j*) Neither study enables us to establish with any certainty what are the daily requirements of ascorbic acid necessary to maintain good health. Arguing on the amount required to saturate the subject at the *conclusion* of the experiment (4 to 6 grammes) the American investigators suggest that the maximal daily utilization must have been between 30 and 45 mg., or possibly lower, since the first symptoms of scurvy appeared after 132 days. However, this estimate cannot be regarded as very satisfactory, since there is no record that the subject was saturated at the start of the experiment; and, indeed, the initial plasma level of only 1 mg. indicates that this was probably not the case.

On the other hand, our own experience indicates that remarkably good health could be maintained on 15 mg. of ascorbic acid, or possibly a little more, daily, and this level is in agreement with that estimated by Kellie and Zilva (1939) using entirely different methods. It seems, too, that the lower estimate is more in accord with everyday experience, since such large numbers of people live on diets that can hardly contain more than this amount, if as much. Taken together, the two investigations lend no support to the assumption, so commonly made, that large amounts of the vitamin would improve the general standard of health, though the *precarious* nature of such meagre supplies is equally clearly demonstrated.

Conclusions

Several other valuable conclusions can be drawn from this study:

1. The observation made by Wiltshire (1919) that in a large proportion of his cases of scurvy the appearance of follicular keratosis provided the first recognizable sign of the scorbutic tendency, and would have enabled a diagnosis to be made before the onset of symptoms, receives striking support. In future more attention should obviously be given to this simple clinical sign.

2. Estimation of the ascorbic acid content of the white cell platelet layer of the centrifuged blood appears to provide us with a reliable method of investigating subclinical scurvy, for it only fell to zero shortly before the appearance of clinical symptoms.

3. The role of ascorbic acid as a prerequisite for the formation of intercellular substance has now been established for the human subject.

4. There are indications that ascorbic acid may be concerned with the rate of disappearance of the blood lactate that accumulates during the performance of physical work.

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SERUM CHOLESTEROL AND IRRADIATION SICKNESS

BY

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The occurrence of sickness and other unfavourable reactions after treatment by *x* rays is no longer a major problem. Careful attention to ventilation, localization of the irradiation, and regulation of the intensity of each dose have very much reduced both the incidence and the severity of *x*-ray sickness. Nevertheless cases do still occur, and no satisfactory or conclusive explanation has yet been offered. They must obviously be of interest to anyone concerned with the general physiological and biochemical effects of irradiation. Symptoms caused by direct irradiation of the stomach or intestines are not under consideration here, and may obviously fall into a quite different category.

The extensive literature on this subject has been reviewed by Rolleston (1930–1), by Colwell and Russ (1924), and by Dodds and Webster (1924). Here it is only necessary to quote Levy-Dorn and Burgheim (1926) and Burgheim (1927). These authors observed in some cases a sharp fall of serum cholesterol after *x*-ray treatment, followed by vomiting. Cases not suffering from unfavourable symptoms showed no fall in serum cholesterol. Burgheim obtained good results by administering cholesterol as a preventive of *x*-ray sickness, and was therefore inclined to consider that a direct relation existed between the low level of serum cholesterol and the symptoms observed. Other authors have been unable to confirm these results.

The following series of cases may to some extent explain this discrepancy. The series is far too small to permit any conclusions to be drawn from it alone (war conditions make it very difficult to obtain further cases), but it may be of value when considered together with the work of Burgheim and of others.

The Present Investigation

The blood sera examined were obtained at the Mount Vernon Hospital, Northwood, with the kind collaboration of Dr. Perkins. Samples of blood were taken by her before irradiation and at the stated intervals afterwards. When it was necessary to keep the samples overnight she drew off the serum and stored it in the ice-chest. It was found that if whole blood is stored there may be a considerable loss of cholesterol.

Irradiation was carried out every day for a given period and the samples here estimated were taken before and after the first two irradiations of such a series. Where no sample was obtained before irradiation the approximate value was assumed to be that obtained in the sample twenty-four hours after irradiation, as these were often found to be the same. This twenty-four-hour sample is also the pre-irradiation sample for the second irradiation.

The method used was that of Leiboff (Peters and van Slyke, 1932). Table I shows that the most usual reaction to the first and often the second irradiation is a considerable rise in serum cholesterol. This rise was stressed by Burgheim, who considered it (personal communication) to be due to cholesterol leaving the tumour after irradiation.

Table II shows that an increase of serum cholesterol did not appear in four cases in which vomiting occurred, but that there was actually a considerable fall. To this extent these figures agree with the result obtained by Burgheim. It will be noticed, however, that there is not necessarily any direct relation between the fall in the serum cholesterol level and the onset of the symptoms. In Case K., for instance, the fall in cholesterol did not occur until after the second irradiation, whereas the vomiting began after the first irradiation, and in Case F. there was still vomiting nearly twenty-four hours after the first irradiation, when the cholesterol value had returned to normal. In Case N. the change was far too small to account for any symptoms; Case W. in Table I, in which no vomiting occurred, showed a slightly greater fall. Other isolated observations—not included in the tables, as they are single estimations and not a series on each case—serve to support the view that there is no direct relation between the serum cholesterol level and the symptoms after irradiation. Thus the serum cholesterol of patients on admission shows very wide variation, being sometimes present in minute traces only. Again, in three cases samples taken shortly after vomiting show normal or even high cholesterol values.

TABLE I

Case	Site	Cholesterol (mg. per 100 c.cm. of serum)			
		Before 1st Irradiation	5 Hours After	Before 2nd Irradiation (24 Hours After 1st)	5 Hours After
P.	Uterus ..	115	200	130	143
C.	Pelvis ..	110	208		
S.	Breast ..	50		50	140
A.	Oesophagus		40	34	59
M.	,,		107	61	160
W.	Breast ..	80	53		53
D.	Vulva ..		86	113	125

TABLE II

Case	Site	Cholesterol (mg. per 100 c.cm. of serum)			
		Before 1st Irradiation	5 Hours After	Before 2nd Irradiation (24 Hours After 1st)	5 Hours After
B.	Uterus ..	100	60 Vomiting		
F.	,,	143	69	140. Vomiting	62 Vomiting
K.	Dorsal spine	200	200 Vomiting		83
N.	Left thigh		67 Slight. vomiting	78	66

In conclusion it can be said, taking these few cases together with those of Burgheim, that in patients liable to *x*-ray sickness there may be a tendency for the serum cholesterol level to fall. Any direct relation between the amount of cholesterol in the serum and the symptoms observed, or any definite time-relation between the two, cannot be substantiated, this probably accounting for the fact that some workers have not confirmed the results of Burgheim. It may well be that some factor concerned with the production of the symptoms tends also to produce a change in metabolism leading to a loss of cholesterol from the blood.

My thanks are due to Dr. Perkins for her kind collaboration and to Dr. Fairchild of the Mount Vernon Hospital for providing us with material.

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The Medical Society of New Jersey, founded in 1766, is the oldest medical society in the United States. Then come Massachusetts (1781), Delaware (1789), New Hampshire (1791), Connecticut (1792), Maryland (1798), and New York (1806) in the order named.

ABDOMINAL HYPERAESTHESIA IN ARMY DYSPEPTICS

BY

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In a leading article in the *Journal* of December 14, 1940 (p. 836), the problem of the disposal of the dyspeptic soldier was discussed, and it was clearly demonstrated that such a man is likely to be a permanent liability to the Army, since a continued light diet is seldom a practical measure on active service. The statement that "it is highly questionable whether men with a prolonged history of organic dyspepsia . . . should be allowed to join the fighting Services" will be endorsed by every unit medical officer; but once a man is enlisted it rests with the medical officer to determine what is a "prolonged history" and what is "organic dyspepsia." The article continues: "The doubtful case should be handled by the expert gastro-enterologist and investigated by every known means at our disposal," which is certainly a counsel of perfection. But the unfortunate M.O. meets "doubtful cases" every morning on his sick parade, ranging from the man who is honestly worried by a slight feeling of distension after his generous midday rations to the true malingerer who "knows all the answers" and is now happily rare. The commonest case to meet is the man who feels it is always worth "trying it on" the new M.O.

It is manifestly impossible for every man complaining of abdominal discomfort to be fully investigated by an expert gastro-enterologist, and in the absence of gross vomiting or definite physical signs the persistent importunity of the patient is the most potent factor in securing the desired period of residency in hospital. Hence it was felt that some test which could be easily applied by the M.O. would be invaluable in sorting out organic disease without it being in any way necessary to establish an exact diagnosis—some way, in fact, to diminish the number of men sent in to military hospitals for radiography, diet, and observation, a process which often takes many weeks.

Technique of the Investigation

The old test of abdominal hyperaesthesia was used and findings correlated with radiography. Thirty cases of dyspepsia admitted for investigation to one ward of a military hospital were examined physically and radiologically. The only common factors were the complaint of dyspepsia and the exhaustion of the patience of the M.O. Service varied from 17 years to 3 months, the age limits were 24 and 53, and symptoms had been present from 5 weeks to 16 years.

After routine oral and abdominal examination the test for hyperaesthesia was conducted with the man's own four-pronged dinner fork; this was drawn down the front of the chest and abdomen, from nipple level to Poupart's ligament, in vertical lines repeated from right to left, the patient being instructed to indicate should he feel anything unusual. This was followed by similar strokes from below upwards, and others horizontally round the abdomen. It was significant that the majority of men appeared profoundly sceptical at first, but were amazed to find themselves calling out spontaneously at the change of sensation experienced; few could describe the phenomenon accurately, but such remarks as "It went sharper," "Like an electric shock," and "A tingling sort of feeling" were common. Especial care was taken throughout to keep the fork at the same angle to the skin when the costal margin was traversed, as the zones of hyperaesthesia were often encountered in this site.

Results

Only 7 out of the 30 patients examined failed to show an area of hyperaesthesia; such a proportion is accounted for by the method of selection, since every one had convinced some M.O. that he had an organic gastric lesion. However, the presence of hyperaesthesia was found to be much more constant than the shape of the area, and it was eventually decided to classify cases purely into upper abdominal and lower abdominal areas, and unilateral or bilateral. The former distinction was invariably obvious, since no area occupied both the hypochondrium and the iliac fossa, and the para-umbilical zone was rarely affected.

TABLE I.—*Site of Hyperaesthesia (30 Cases)*

Supra-umbilical—bilateral	9
" " —right only	11
" " —left only	1
Infra-umbilical—right only	2
" " —left only	0
No hyperaesthesia	7

Radiological investigation was carried out to determine the connexion between hyperaesthesia and the organic condition of the stomach as demonstrable by radiography.

TABLE II.—*Results of Barium Meal Radiography*

A. Without hyperaesthesia (7 cases):	
Normal stomach and duodenum	3
Some degree of gastroptosis	2
Evidence of old duodenal ulceration, probably healed	2
B. Upper abdominal hyperaesthesia (21 cases):	
Duodenal ulcer demonstrable	12
Gastric ulcer demonstrable	2
Spasm suggestive of ulcer	2
Gastroptosis	1
Gastritis present	4

Each of the two cases with hyperaesthesia in the right iliac fossa showed a slight pylorospasm on radiography.

Comment

Fourteen cases of upper abdominal hyperaesthesia had peptic ulceration confirmed by radiography; the hyperaesthetic area was typically situated below the ninth right costal cartilage, with often a similar area of less intensity on the left; the only case with purely left-sided signs showed a gastric ulcer of the lesser curve.

Seven further cases with hyperaesthesia had abnormal radiographs, and taking into consideration the previous history and present symptoms there was enough evidence for reference to medical boards.

Two cases of chronic appendicitis had attention focused upon them by the discovery of hyperaesthesia in the right iliac fossa.

Of 7 cases without hyperaesthesia the radiographs were normal in three and revealed gastroptosis in two; in the other 2 cases, 1 had had an old ulcer but had been symptom-free for over a month, while the final case still had symptoms.

Conclusions

From the varying nature of the lesion which can produce right hypochondrial hyperaesthesia it is evident that no peritoneal involvement is needed for the production of the sign; yet the fact that not one case with hyperaesthesia presented a radiograph that could be classed as normal must be evidence that some organic disturbance of the mucous membrane or musculature is necessary for its production. Whether such a lesion will necessarily be severe enough to justify "boarding" a man out of the fighting Forces is debatable, but we draw the conclusion

that the presence of upper abdominal hyperaesthesia in an Army dyspeptic is sufficient to warrant hospital investigation.

Summary

Abdominal hyperaesthesia has been tested in 30 Army dyspeptics suspected of peptic ulceration.

Its presence has coincided considerably with abnormal radiological findings.

It is claimed that such a test may give R.A.M.C. officers in charge of troops some clear indication of which dyspeptic cases will require hospital investigation and which may be retained with the unit.

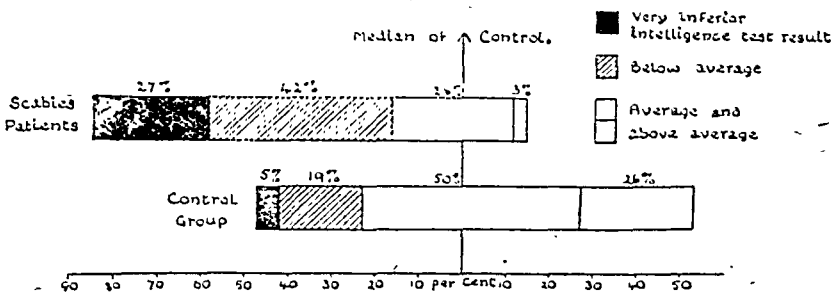
THE INCIDENCE OF SCABIES AND ITS APPARENT DEPENDENCE UPON SUBNORMAL INTELLIGENCE

BY

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Scabies constituted the greatest single cause of incapacity among troops stationed in 1915 in the United Kingdom (*Official History of the Great War*, 1931). It was noted that from 1916 to 1920 the ratio of cases occurring in France to those in the United Kingdom was about 20:18, the observation suggesting that the insanitary conditions of trench warfare were less important as an aetiological factor than is commonly supposed. Recent clinical experience suggested that the man who is most likely to contract scabies is the "dullard" or the mental defective.



Accordingly a preliminary sample of 100 unselected scabietic patients has been examined to assess their intelligence. The results have been compared with those obtained in a control sample of 500 consecutive recruits at a R.A.M.C. depot tested in the same manner. The test employed was the R.E.C.I. progressive matrices (Penrose and Raven, 1936; Raven, 1939), the sets A, B, and C being used, as these give a high degree of differentiation between individuals of average and those of below average intelligence. The validity of each score was confirmed by comparing the marks in each set with the expected "break-up"—i.e., distribution of marks between the three sets. With a possible total score of 36, the middle 50% of the scores in the control group fell between 27 and 32 inclusive, the median being 30; and these scores were considered "average." The 5% scoring 19 or less were termed "very inferior," the 26% scoring between 33 and 36 "above average." The same score standards were adopted in grouping the scabietic patients, of whom only 14% scored above the median of the control group. The table shows the comparison between the groups.

Marks	Control	Scabies	Group
0–19	5%	27%	"Very inferior"
20–26	19%	42%	"Below average"
27–32	50%	28%	"Average"
33–36	26%	3%	"Above average"

Thus it is seen that the scores of 27% of the scabietic patients lie in the "very inferior" group—i.e., low enough to warrant the suspicion of mental defect; while those of another 42% fall below the "average" range; only 3% achieved "above average" scores. The differences are shown diagrammatically below.

Although the investigation of a comparatively small series is inconclusive, the results suggest a close correlation between the incidence of scabies and that of subnormal or defective intelligence.

Discussion

Scabies prophylaxis in the Army includes regular bathing, avoidance of overcrowding in billets, disinfestation of blankets, clothing, and latrines, the inspection of troops, and the treatment of developed cases in isolation. Nevertheless, the high incidence continues. Some cases undoubtedly come from propinquity or from infection acquired at home whilst on leave. Personal uncleanliness predisposes to infection, and a large number of scabietic patients have dirty clothes, dirty skins, and dirty habits. At home stations the majority of troops are within reach of normal sanitary amenities, but some men remain dirty however good the facilities and however strict the discipline. These men are usually of much below average intelligence. Such men may well form a nidus, infecting from time to time their more intelligent fellows. To rid the Army of the mentally defective would go a long way toward ridding it of scabies.

This inquiry is continuing on a larger scale, and venereal disease, pediculosis, and other cutaneous diseases are being investigated similarly.

Summary

100 unselected scabies patients and a control group of 500 consecutive recruits have been submitted to an intelligence test. Scores suggesting subnormal and low-grade intelligence were found in great excess among the scabietic patients.

I wish to thank Lieut.-Colonel P. Dwyer, *M.C.*, R.A.M.C., for giving facilities for the investigation, and the Officer Commanding No. 11 R.A.M.C. Depot and his staff for their assistance in providing the control series. I am indebted to Major G. R. Hargreaves, R.A.M.C., for his kind and helpful collaboration.

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J. D. Rolleston (*Clin. J.*, 1940, **69**, 321), who emphasizes the rarity of laryngeal diphtheria in adults, has collected twelve cases in adults aged from 22 to 76, including one of his own in a woman aged 76. Five were in men and seven in women. In five the larynx only was affected, in six the fauces as well, and in one no details were given. Intubation was performed in two, tracheotomy in one, laryngotomy and tracheotomy in one, intubation and tracheotomy in one, and no operation in seven. In five the laryngeal symptoms were confined to loss of voice and a croupy cough, which helps to explain the unusually low mortality in the present series. The death of George Washington at the age of 67—which has been variously attributed to laryngeal diphtheria, Vincent's angina, Ludwig's angina, tuberculosis, pneumonia, and cancer—was most probably due to septic sore throat.

Clinical Memoranda

Effect of Vitamin A on the Secretion of Gastric Juice in Deficient Hydrochloric Acid Production

E. Schiödt (1934, 1935) has called attention to the changes in the digestive tract produced by vitamin deficiency. He says that lack of vitamin A causes atrophy of the gastric mucosa while lack of vitamin B is followed by achlorhydria and lack of vitamin C by gastric ulcer. R. Boller (1936a, 1936b, 1937) found that if 10 drops of vitamin A solution in oil were given an hour before an alcoholic test breakfast the resulting acid values in normal and subacid people were increased. He also observed that cases with symptoms of achlorhydria or insufficient acid production were benefited by giving vitamin A continuously. His observations were confirmed by G. W. (1936).

It seemed desirable to investigate these results with a view to the constructive treatment of inadequate acid production. We therefore studied the effect on the gastric acid of a single

TABLE I

Case No.	Maximal Acid Value without Previous Vitamin Administration		Maximal Acid Value after Previous Vitamin Administration		Result
	Free	Total	Free	Total	
1	2	22	5	24	Positive
2	24	36	45	56	Negative
3	8	16	8	20	
4	18	26	4	12	
5	0	8	0	10	Positive
6	10	18	32	44	Negative
7	10	12	10	24	
8	0	8	0	8	
9	0	10	0	12	
10	8	26	4	12	

dose and of continuous administration of vitamin A. The first part of the investigation was carried out as follows, the results are shown in Table I.

Patients were selected by giving a fractional test breakfast of 20 cg. of pure caffeine in 200 c.cm. of water; those who showed decrease or insufficient production of hydrochloric acid were then given 20 drops of vitamin A solution thirty minutes before the test meal. The solution used was "Virgin," supplied to us by Messrs. Wander Ltd.; it contains 40,000 international units in 20 drops. In only 3 out of 10 cases did this single dose produce an increase of the hydrochloric acid in the gastric juice; but 3 of the negative patients were subsequently treated with continuous dosage, and all of them then lost their symptoms and showed normal acid values after test meals.

We have treated 20 cases of achlorhydria or hypochlorhydria by giving vitamin A for two or three weeks. In 12 cases symptoms improved, weight increased, and the fractional test breakfast showed an increase of total acid and of free hydrochloric acid (Table II). The patients who responded to this treatment were suffering from chronic gastritis, diabetes mellitus, Graves's disease, renal lithiasis, gastroptosis, and neurasthenia. In other words they all had a chronic inflammation of the gastric mucosa or else their deficient acid secretion was secondary to the functional alteration of some other organ. Those who failed to respond were suffering from gastric cancer (1), pernicious anaemia (2), and disorders of bile secretion or excretion (5). In cancer and pernicious anaemia the gastric mucous membrane is so atrophic that no effect could be expected, but the reason for resistance of achlorhydria associated with disorder of the biliary tract is less obvious. We assume that the absorption of vitamin A, a fat-soluble substance, may be influenced by such anomalies in the same way as fat digestion and fat resorption generally.

To test this hypothesis we treated a histamine-anacid patient, suffering from cholelithiasis, with simultaneous administration of 0·5 gramme of sodium taurocholate and vitamin A three times a day for two weeks. Previous administration of vitamin A alone for two weeks had been ineffective. On the combined dosage the test breakfast showed a free-acid figure of 8 and total acid 20. Although conclusions cannot be drawn from one case, it seems justifiable in such cases to exhibit vitamin A together with bile salts.

We were able to follow up 2 cases: No. 8 in Table II was still improved after six months, but the other, which had been treated with taurocholic acid as well as the vitamin, relapsed to complete achlorhydria.

Summary

Moderation or total alleviation of the symptoms of achlorhydria or hypochlorhydria may be obtained by the administration of vitamin A. For private practice this may conveniently be given as four tablets (16,000 I.U.) three times a day for two weeks, then two tablets (8,000 I.U.) thrice a day for a further two weeks, repeating the course after an interval of four weeks.

Test meals show a considerable increase of free acid and total acidity after such treatment, and there is also increase of weight.

TABLE II

Case No.	Diagnosis	Duration of Vitamin Administration Days	Preceding Vitamin Treatment			Subsequent to Vitamin Treatment			Result	Remarks
			Maxim. Acid Value	Lactic Acid	Mucus	Maxim. Acid Value	Lactic Acid	Mucus		
1	Chronic gastritis	17	2, 22	—	— —	36, 48	—	+	Positive	
2	" "	16	12, 24	—	—	33, 54	—	—	"	
3	" "	9	10, 18	—	—	36, 48	—	—	"	
4	" "	10	12, 24	—	—	22, 36	—	—	Negative	Before and after treatment histamine-anacidous
5	Ventricular ptosis	12	0, 10	—	—	16, 24	—	—	"	
6	Carcinoma ventriculi	14	0, 8	—	—	0, 8	—	—		
7	Cholelithiasis	15	0, 10	—	— —	18, 30	—	—	Positive	Before and after treatment histamine-anacidous
		12	0, 8	—	—	0, 12	—	—	Negative	Before treatment histamine-anacidous
8	"	10	0, 18	—	+	24, 36	—	+		
9	"					0, 6	+	—	"	Before and after treatment histamine-anacidous
10	"	13	0, 4	—	— —	0, 10	—	+	"	Before treatment histamine-anacidous
11	"	12	4, 12	—	— —	0, 12	—	—	Positive	
12	"	18	0, 7	—	—	8, 24	—	—	"	
13	Status post-cholecystectomiam	14	0, 12	—	—	18, 30	—	—	"	
14	Diabetes mellitus	13	10, 16	—	—	32, 40	—	—	Negative	Before and after treatment histamine-anacidous
		15	8, 18	—	—	32, 44	—	—		
15	"	15	8, 26	—	+	0, 8	—	—	"	Before and after treatment histamine-anacidous
16	Graves's disease	10	0, 6	—	+ +	0, 6	—	+	Positive	
17	Neurasthenia	14	0, 7	—	+ +	20, 23	—			
18	Pernicious anaemia	17	8, 16	—						
19	" "									
20	Nephrolithiasis									

Cases of gastric cancer, pernicious anaemia, or dysfunction of bile secretion do not respond.

One resistant case of biliary dysfunction responded when vitamin A was combined with bile salts.

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Intrathoracic Use of Sulphanilamide in Empyema

The following case seems to be interesting enough to merit publication.

CASE REPORT

On October 28, 1940, I saw a man aged 55 who had acute pleuritic pain and some dullness over the lower lobe of his left lung. The next day the diagnosis of left basal pneumonia and severe pleurisy was established. The evening temperature was 103.8°. During the following week he was very ill, and poisoned, and I suspected that empyema was developing. He absolutely refused, after the second day of his illness, to go on taking sulphapyridine (M & B 693) tablets, as he felt so nauseated, ill, and miserable.

As there was no fall of temperature on the eighth day I explored his chest, but only got some blood. On the eleventh day I again explored, and found stinking pus in the lowest part of his pleural cavity. Aspiration was at once done, and about 9 oz. was drawn off. As the patient was too ill to wait for further aspirations I drained his chest the next day, using the closed method, with the end of the tubing in a bottle of dettol solution. The pus evacuated smelt horribly. Soluseptasine was given intravenously, and his temperature came down to normal for one day, then rose to 100.6°. Prontosil by mouth was not tolerated, so I persisted with soluseptasine injections. His condition was very unsatisfactory: his face was grey and puffy. The discharge was still foul and copious, although the drainage was satisfactory.

Nine days after his operation I crushed six 0.5-gramme tablets of sulphanilamide (prontosil album), suspended them in sterilized water, and injected the drug through the drainage tube. The next day there was a dramatic improvement in his colour and the discharge was much less and not offensive. He had four more similar injections in the next nine days; then the tube was removed and the wound dried. His temperature became normal seven days after the change of treatment.

For local treatment of wounds sulphanilamide is now used extensively, but I have not noticed a record of its use for empyema.

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J. Mioni (*Thèse de Paris*, 1940, No. 324) states that acceleration of the sedimentation rate is never a premonitory or initial sign in diseases of the joints. It never precedes the development of clinical manifestations, but as it may accompany these manifestations it enables the organic nature of the symptoms to be affirmed. In the absence of any morbid association the acceleration of the sedimentation rate justifies the suspicion that a patient with painful symptoms is suffering from a highly inflammatory process such as acute articular rheumatism, subacute rheumatism of a chronic and generalized character, spondylose rhizomélique, or gout. The intensity of the sedimentation rate is generally in proportion to the acuteness, intensity, and extent of the inflammatory manifestations, but their clinical expression may have disappeared when the sedimentation rate is still accelerated, thus indicating that the causal process has not yet finished.

Reviews

CLASSIFICATION OF TUMOURS

Debatable Tumours in Human and Animal Pathology. By W. F. Harvey, E. K. Dawson, and J. R. M. Innes. (Pp. 124; illustrated. 10s. 6d. net.) Edinburgh and London: Published for the Cancer Control Organization of Edinburgh and South-East Scotland by Oliver and Boyd.

This is the first of a projected series of memoirs to be published under the auspices of the Cancer Control Organization of Edinburgh and South-East Scotland, and consists of slightly revised versions of papers which originally appeared in the *Edinburgh Medical Journal*. Nine tumour-classes are dealt with under the headings: Seminoma, Granulosa-cell Tumour of the Ovary, "Mixed Tumours" of the Salivary Glands, Melanoma, Lympho-epithelioma, Giant-cell Tumour of Bone, Endothelioma, Lymphosarcoma, and Meningioma. Material from a very large number of tumours has been available, and a determined attempt has been made to discover and define the natural limits of each of the classes selected for study. The result is a series of concise descriptions of the range of tissue abnormalities which, it is thought, must be considered as belonging to each of these several classes.

Reports of prolonged and intensive studies such as these serve at least one useful purpose not contemplated by their authors, for they illustrate the difficulties which beset attempts to reach a completely logical and consistent classification of tumours on the basis of cellular affinities—the basis usually accepted. No better basis is known. But do we always realize what it is that we attempt? Secondary classifications are determined, for instance, by the degree to which tissue-forming, functional, or invasive qualities are actually exhibited in the developed tumour. Our primary object, however, is to group together tumours which have arisen from like cells—that is, from cells which, starting from the fertilized ovum, have followed a similar line of differentiation and, within reasonable limits, to a similar degree. These characters we must deduce from histological examination of the developed tumour, well aware the while that an unknown degree of cell differentiation or of cell dedifferentiation may have taken place at or since this elusive normal cell first took on malignant characters and thus became ancestor of all the tumour cells in the mass before us. Harvey, Dawson, and Innes escape the difficulty, so far as tumours of highly differentiated tissues are concerned, by assuming that in such tissues there is normally present a residuum of embryonal cells from which all cell-replacements come and from which all tumours arise. Such a conception seems of necessity to imply that as a rule much differentiation occurs at or after the time of tumour inception. Most workers have felt impelled to the view that tumours do often arise from highly differentiated normal cells and that quite commonly there is a demonstrable reversion to simpler type, rather than an increased degree of specialization, as such tumours grow and spread.

One of the very disturbing difficulties which arise in classifying tumours according to cellular likenesses is illustrated in the fact that Harvey, Dawson, and Innes feel themselves logically bound to include at least some forms of granulation tissue in their "giant-cell-tumour-of-bone" class and to place in the "melanoma" group conditions which most have regarded as simple malformations. Reflecting on all this one has the uneasy feeling that possibly our efforts at consistent classification are largely vitiated at present by the absence of important information of unknown nature. After all, the characters

we use in the classification of tumours are simply characters which may be exhibited by the corresponding ordinary normal cells when given the right conditions. The characters are no innovations—as witness the difficulty found in deciding, given an isolated cell, whether that cell is malignant or not. Short, perhaps, of tissue-invasive activities, all we really observe are various non-specific manifestations of cell activity. One feels that perhaps real improvement may come only when use can be made of features truly peculiar to the malignant condition itself—that is, to the reason for the malignant condition. Appreciation of the essential unity of the various scrofulous conditions had to await the discovery of the tubercle bacillus, and the essential manifestations of scurvy were not precisely defined until the discovery and identification of "food factors." What is the equivalent in tumours? Are we, indeed, even viewing the problem right? Unfortunately discussion of such general problems falls outside the purpose of the book under review.

It is convenient to have these papers accessible in collected form. They will be consulted by specialists. They are clearly and tersely written, contain an abundance of excellent illustrations, and provide extensive bibliographies. Authors and publishers are to be congratulated.

MEDICAL CHEMISTRY

Exposés Annuels de Biochimie Médicale. Published under the direction of Michel Polonovski. Second series. (Pp. 264. 75 francs.) Paris: Masson et Cie. 1939.

This volume, the second of its kind, comprises a series of twelve addresses on subjects belonging to the domain of medical chemistry, delivered by eminent biochemists at the Faculty of Medicine, Paris. Each is designed to convey to an audience not necessarily well versed in the subject an understanding of the position which has been reached by recent scientific investigation, and also the stages by which the most important advances have been made. Readers will note that the subjects are presented in a vivid and fascinating way, and where some of them are inherently difficult every care has been taken to make them easy to comprehend. Many of the contributors are of world-wide repute, and their names are an assurance of the authoritative nature of their expositions. The opening lecture is by A. Szent-Györgyi, than whom there is no greater expert on the subject of biological oxidations. Discussing the outstanding work of Warburg, Wieland, and Keilin, with an occasional modest reference to the results achieved in his own laboratory, he traces out the progress of the last ten years, which has quite revolutionized our knowledge. A discourse by E. J. Bigwood on objective methods of studying deficiency disorders in respect of vitamins A, C, and D, with special reference to their use in the recognition of subclinical states, is of more direct medical interest. Regarding C-deficiency, both chemical titration methods employing dichlorphenol-indophenol and methods based upon the measurement of capillary resistance receive special attention. Structural organic chemistry plays an important part in the pages devoted to the hormones of the adrenal cortex, but there is also a good deal about biological test methods applied to the study of cortical activity. P. Florence reviews the subject of uric-acid metabolism, a field in which he shows that there are a number of interesting problems awaiting solution.

Other lectures cover such diverse topics as immunochemistry, the chemical constitution of the enzymes, virus proteins, and the biochemistry of magnesium. It is not possible in this brief space to do more than give some idea of the contents, and to add the opinion that for its clear, readable accounts of present-day knowledge in all these spheres the volume is worthy of attention from English readers who are able to procure a copy, particularly as there is nothing quite analogous to this publication in our own language.

SOCIAL APPLIED SCIENCE

The Century of Science, 1840–1940. By F. Sherwood Taylor, Ph.D., M.A., B.Sc. (Pp. 230. 8s. 6d. net.) London and Toronto: William Heinemann, Ltd. 1941.

It is curious that the publishers of *The Century of Science*, by Dr. F. Sherwood Taylor, in their advertisements of the book in the newspaper press and even in their slip accompanying copies sent for review, should mis-state its title as "A Century of Science"; for in this case the definite article is significant. The author deals not with science in general during a period of a hundred years, but with the practical applications of science to domestic, industrial, and social life during the century in which those applications have been revolutionary in their effects upon the habits and beliefs of civilized man. This century, with justice, he takes to be the years 1840 to 1940. The author, not a medical man, has written two previous books—*A Short History of Science* and *The World of Science*, which have been highly praised, and his present volume equally demonstrates that he possesses powers of selection, summarization, ordering, and narration which are exceptional. The earliest science of Egypt and Mesopotamia was applied science. During subsequent years there were philosophers, like Roger Bacon and Francis Bacon in England, who thought of the prime purpose of science as the promotion of man's welfare by the establishment of his domination over Nature. In the seventeenth and eighteenth centuries, particularly in the sixty or seventy years just before 1840, there were important, though tentative, technical scientific applications and the beginnings of mechanization in a few industries; but what Dr. Sherwood Taylor describes as the "precipitate arrival at maturity" of those applications and of that mechanization may truly be said to have occurred about the year 1840. To examine and to delineate these movements is the purpose of this book, and it is admirably accomplished.

In two chapters of the book progress during the hundred years in the spheres of health and of medicine is dealt with. These are entitled "The War Against Dirt" and "Modern Medicine and Public Health Services." There have been issued during recent years a number of publications, some of them quite excellent, covering this ground, or parts of this ground: but for comprehensiveness, accuracy, interest, and effectiveness, Dr. Taylor's chapters will compare favourably with any of them. In these two chapters there are only two words that we could wish away, and we hope the author may delete them in any future edition. On page 130 he writes: "The old methods of diagnosis by questioning the patient and using the senses of sight and touch, aided by a shrewd power of observation, have been steadily supplemented and supplanted." If the last two words are true this surely represents a retreat rather than a welcome advance and indicates one of the dangers of modern medical education and practice. These are by no means the only chapters of the book which have a direct medical interest or application. The others on transport and communications, on the conditions of labour, on the middle-class home, and on the opportunities and use of leisure, all contain points of importance for the practitioner. The last chapter is of a different character. It concerns the changes in belief and habits of thought. If it had been presented frankly as the individual "credo" of the author it would be worthy of the highest respect; and doubtless in one aspect

or another it approximates to the opinions of many to-day. It is not inaccurate, too, to describe thought in 1840 as "traditional" and in 1940 as "rationalistic"; but the chapter is incomplete and imperfect as a statement of the general belief of the people of Great Britain, which can still properly be described broadly as a Christian country.

PSYCHIATRIC ASSESSMENT

Personality and Mental Illness. An Essay in Psychiatric Diagnosis. By John Bowlby. With a Prefatory Note by the late Prof. Edward Mapother. (Pp. 280. 10s. 6d. net.) London: Kegan Paul, Trench, Trubner and Co., Ltd. 1940.

The central fact that this book seeks to establish is that in the absence of certain traits of character and temperament schizophrenia is unlikely to develop. Upon this observation the author bases a slightly polemical re-presentation of the now well-established psychiatric principle that psychiatric assessment should take into account not only the present symptoms but the previous personality of the patient, and he affirms a belief in Kretschmerian typology. He scouts the notion that there is any hard-and-fast or qualitative difference between psychoses and psychoneuroses; and curiously enough explicitly adopts the testimony of authors whose work tends to dispense with the statistical and heredity studies which probably alone could be decisive and who, unlike Dr. Bowlby, pay only lip-service to psychotherapy. Nevertheless, his work on pre-psychotic traits is interesting, although the numbers are too small to be conclusive and controls are lacking. On the self-preservative principle that those who live in glass houses should not throw stones, it would have been wiser if the arguments had been more irrefragable. For example, on the ground that certain traits are never found in personalities with affective disorders, he calls them specific schizoid traits, but takes little notice of the fact that three other traits are never found by him in schizophrenes. One of the marks of a sound theory is that it makes prediction possible, but when a potential schizophrenic, on his reckoning, fails to develop the disorder, the fact is relegated to a footnote. Nearly all the cases listed as "conversion hysterias" and "obsessional neuroses" would be considered to be constitutional depressions by most psychiatrists. Despite these faults, the thesis of the book is worthy of further attention.

THREE "PRACTITIONER" PUBLICATIONS

The "Practitioner Handbooks" continue to make their welcome appearance in attractively designed dust-jackets. *Modern Diagnosis,* edited by Sir Humphry Rolleston and Dr. Alan Moncrieff (Eyre and Spottiswoode (Publishers) Ltd., 12s. 6d. net), is a volume of 286 pages, and is based upon contributions to the *Practitioner* which have been made during the past few years. The article on technique of simple blood examinations and methods for collection of blood, by Dr. C. J. C. Britton, was especially written for the volume under review. The authors follow well-worn paths, and remind readers of much that they have learnt and forgotten, and also of what is new in the market-place. The life of a medical practitioner is one long revision course, and attempts such as this to help him are praiseworthy, but the price of the book seems to us rather high. From the same house comes yet another small volume devoted to surgery in wartime (*Special Surgery in War Time*: Eyre and Spottiswoode (Publishers) Ltd., 6s. net). Its seventy-four pages (unindexed) comprise articles on head injuries by Mr. D. W. C. Northfield; diagnosis and treatment of spinal cord injuries by Dr. Douglas McAlpine; abdominal injuries and wounds by Mr. V. Zachary Cope; chest injuries in modern warfare by Mr. T. Holmes Sellors; and the treatment of burns by Mr. A. B. Wallace. A third volume—which should be of much assistance to medical men—tells the reader what he must do to satisfy the demands of the modern inquisition—the Department of Inland Revenue (*Income Tax for Medical Practitioners*: Eyre and Spottiswoode (Publishers) Ltd., 6s. net). In 147 pages (including index) Mr. A. L. Boydon gives chapter and verse for the solution of all the many income-tax problems that beset a profession which has no great reputation for financial acumen. Some sections will attract more interest than others, and it is possible that many readers will skip the chapter on surtax and hurriedly go on to a later chapter—legal avoidance of tax. There is a misprint on page 30: 31/12/39 in the first column of Assumption 2 should be 31/12/38; and the final comparison of the result of applying the "cash" basis and the "profit and loss account" basis to the same case is misleading because no deduction for depreciation, or replacement, of car is claimed in the former alternative, although £41 is deducted in the "profit and loss" calculation.

Notes on Books

In *My Uncle Frank* Prof. THOMAS BODKIN gives an engaging account of his boyish recollections of Dr. MacMahon, a great character of a type of medical man now extinct. MacMahon was an Irish landed proprietor who did not enter upon the study of medicine until he was 40 years old. It is not surprising, therefore, that examinations presented difficulties. Once qualified, however, his human sympathies, his practical common sense, and his intimate knowledge of the people among whom he lived made him an invaluable asset to the whole neighbourhood, by whom he was greatly beloved. This little book is published at 5s. by Robert Hale, Ltd.

Experimental Physiology, by Dr. GEORGE H. BELL, is the practical classbook used in the Glasgow Medical School and is published in that city by John Smith and Son, Ltd., at 6s. The number of frog experiments is relatively small, and the author has shown great ingenuity in devising a long series of human experiments, most of which can be carried out with very simple apparatus. The course should give the medical student a wide basis of information regarding the manner in which his body functions.

Preparations and Appliances

NON-ADHERENT GAUZE

"Nonad Tulle" non-adherent gauze net (Allen and Hanburys Ltd.) consists of squares of wide-mesh gauze which are supplied embedded in a mixture containing 98 parts by weight of soft paraffin, and 1 part each of balsam of Peru and of halibut oil, the latter giving the material a specified vitamin A and D content. A single layer of this gauze is placed on wounds, burns, etc., and covered with dry dressings: it prevents adhesion to the wound surface but enables wound discharges to be absorbed by overlying dressings. The price of a box containing ten pieces 4 in. × 4 in. is 3s. 6d.

PYLUMBRIN (DIODONE)

Pylumbrin (diodone) is a British-made contrast agent manufactured by Messrs. Boots Drug Co., Ltd. It is used for excretion radiography of the renal pelvis, ureters, etc. The chemical name is "diethanolamine salt of 3:5-di-iodo-4-pyridone-N-acetic acid," and diodone is a non-proprietary title agreed upon for preparations of this compound. Pylumbrin has been submitted to extensive clinical trial and the results show that it is well tolerated and gives excellent contrast shadows.

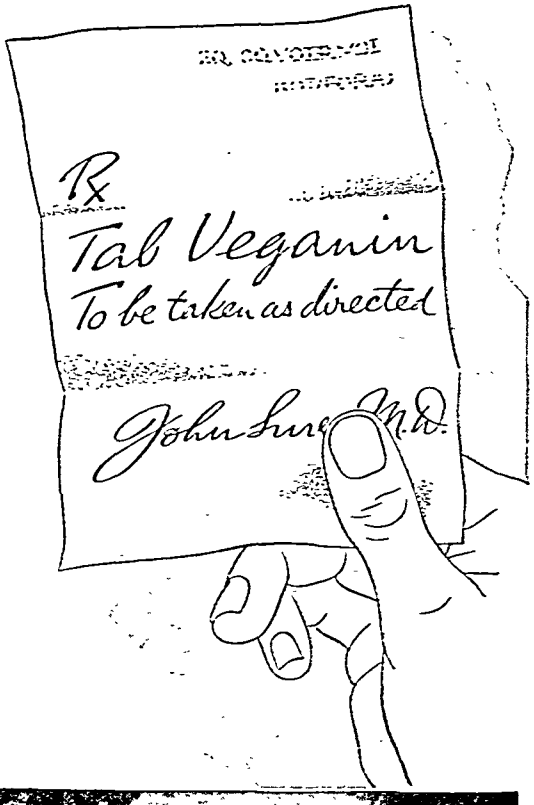
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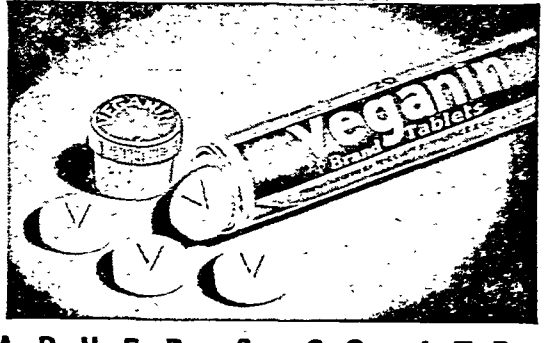
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THE MECHANISM OF INFLAMMATION

The sequence of events in an area of inflammation has been described in almost unvarying terms since the days of Cohnheim and Metchnikoff, and it would occur only to the more questioning mind that there may be much yet undiscovered about it. That a whole series of new explanations could be found for the successive stages of the inflammatory process is a development which few people can have expected. Yet this is the outcome of studies which have now been pursued for over ten years by Valy Menkin of Harvard, and anyone who has to write or teach on this subject or to investigate it experimentally from whatever standpoint must take account of his findings and conclusions. They are now conveniently assembled in a book recently published,[1] in which the whole argument is logically set out. Many experimental details upon which the validity of his conclusions may well depend are only to be found in the author's numerous original papers.

The first stage of inflammation is the subject of Menkin's most extensive advances beyond existing knowledge. These consist in showing that in areas of inflammation a hitherto unknown substance is produced which is responsible both for increased capillary permeability and for leucocytic emigration. This substance, which has been named "leukotaxine," can be extracted from inflammatory exudates and purified by a complex process which eventually yields the substance in crystalline form. Since the digestion of serum with trypsin yields a product with identical characters, leukotaxine is considered to be formed by the breakdown of body proteins. It is decidedly not histamine, from which it differs in seven carefully studied properties. Although leukotaxine is locally chemotactic for leucocytes, it does not cause leucocytosis, but inflammatory exudates contain another substance which has this effect: this differs both from leukotaxine in its physical properties and from nucleic acid in the rapidity of its action; hence it would appear to be another product the existence of which has hitherto been unknown. A second very important item in Menkin's redefinition of the inflammatory process is the fibrin barrier. The deposition of fibrin both in tissue spaces and in lymphatics, which walls off the inflamed area and localizes the infection, is considered to be "the primary and basic mechanism of fixation." Its existence is proved in a variety of ways apart from direct demonstration in histological sections: dyes, insoluble particles, and foreign proteins, either injected into the area or reaching it from the blood stream, are found to be retained there. Among other effects this fixation of the elements concerned in the inflammatory process is said to lead to an increased local concentration of antibodies. Strangely enough, although staphylococcal infections become walled off by fibrin in as short a time as one hour, whereas streptococcal lesions may drain freely for as long as forty-five hours, it is not considered that either staphylocoagulase on the one hand or streptococcal fibrinolysin on the other has anything to do with this striking difference. The third major proposition in Menkin's thesis is that the cytology of an inflammatory exudate varies with and depends on its *p*H. With the increasing acidity due to a local accumulation of lactic acid, polynuclears die and are replaced by macrophages, which are not only attracted by but are capable of activity in the more acid medium. These are the three main pillars in what is almost a totally new edifice of theory about the inflammatory process.

Not all these conclusions, or even the observational facts on which they are based, will be unquestioningly accepted—indeed, some have already been contested. That the whole hypothesis is highly mechanistic, whereas some of the alternatives are teleological, is in its favour, but Menkin claims to have demonstrated so many new sequences of cause and effect that he seems almost to have devised experiments with the object of adding to their number. Some of his experiments involve highly artificial conditions: the isolation of leukotaxine, for instance, is a very complex process, although the fact that non-inflammatory fluids do not yield this substance from it is an answer to such criticism. Perhaps the most formidable objection to accepting leukotaxine as the cause of exudation is the fact that capillary permeability may be increased within two minutes of the application of an irritant: is it conceivable that the protein katabolism necessary to produce leukotaxine can complete itself within so short a time? Most of the facts about fixation in an inflamed area appear unassailable, but the observations of J. P. Fox[2] on the concentration of antibodies in inflamed areas are far from convincing; such differences as he found are explicable merely by increased vascularity, and these form the main basis of Menkin's assertion on this point. The proposition that the cytology of an exudate is controlled by its *p*H has been hotly contested by B. Steinberg and A. Dietz,[3] who used different methods of studying this point; it may be added that the general behaviour of macrophages in different kinds of infection, not forgetting their preponderating part in conditions never accompanied by suppuration, does not encourage the idea that acid peculiarly attracts them. Although this may seem to be only playing with words, bacteriologists will have something to say about Menkin's definition and explanation of "invasiveness." *Streptococcus pyogenes* is said to be invasive because it produces little local injury and hence does not stimulate the formation of a fibrin barrier, whereas *Staphylococcus aureus* is rapidly walled off owing to the intensity of the local injury produced. This seems too complete a paradox to contain the whole of the truth. It also needs to be explained what is the real relation between invasiveness and the "spreading factor" of Duran-Reynals; Menkin is inclined to regard them as connected, but it has repeatedly been shown that staphylococci form this substance, a fact with which the rapid

[1] *Dynamics of Inflammation*, by Valy Menkin. New York: The Macmillan Company, 1940.

[2] *J. Immunol.*, 1935, 31, 293.

[3] *Arch. Pathol.*, 1938, 25, 777.

walling-off of staphylococcal lesions seems inconsistent. The concept of localization by a purely mechanical barrier disregards the function of agglutinin, although Menkin grants the localizing effect of this antibody in the immune animal. These are some of the difficulties in the way of accepting all these new propositions as they stand; but however it may come to be regarded in the light of further work, Menkin's study of inflammation represents an exceptional effort to get back to first principles, and should reawaken interest in simple and fundamental questions of cellular behaviour. If there is any truth in his contentions at all we must admit that years of hackneyed repetition have convinced us of comprehension when in fact much was still hidden from us.

PROGRESS IN ELECTRO-ENCEPHALOGRAPHY

A recent contribution from Berlin on human electro-encephalography illustrates the skill of some German scientists in using a long-winded fallacy to make a mystery out of a matter of fact. Kornmüller,[1] for example, assumes that the lobe of the ear is an "indifferent" or reference electrode for the brain. Actually, the ear is in as good anatomical and electrical contact with the brain as any part of the skull; a recording system connected between the ear and another point on the head is as likely to pick up electrical phenomena from the one electrode as from the other. In fact, some of Kornmüller's own records illustrate this clearly. Secondly, he assumes that the size of the deflections in his records depends upon the degree of amplification to which he has set his apparatus, neglecting the fundamental derivation from Ohm's law that the size of the potentials across any pair of electrodes is proportional not only to the electromotive force concerned but also to the resistance between the electrodes. In common speech, if the electrodes are very close together they will tend to be short-circuited and will pick up relatively little of the available voltage. These are both ancient fallacies long ago exposed and acknowledged, yet when wrapped up in a twenty-one-page paper with ten illustrations they encourage Kornmüller to develop an abstruse and illogical theory of the electro-anatomical structure of the brain. In an entirely different class is work recently published in America. Schwartz and Kerr[2] have studied the electrical activity of the brains of twenty-two patients by placing sterile electrodes directly on the cortex during operations. This is a method of investigation used previously only by Foerster and Altenburger in Germany and by Walter in this country. The American workers report much the same findings as the earlier observers. In "normal" cases the rhythms are much the same as those seen with electrodes on the scalp, though of course they are very much larger. In cases of cerebral tumour it is confirmed that the new tissue has no electrical activity at all, whereas the cortex in the neighbourhood is discharging enormous slow waves, the "delta" waves first used by Walter to localize intracranial lesions. When the whole cortex is disturbed, as in hydrocephalus, the direct leads pick up less than the scalp ones, since they are so close together that the large diffuse swings affect both equally.

These observations provide useful objective confirmation of the discoveries made in the last few years in the course of clinical or applied electro-encephalography; this, too, has progressed in technique and trustworthiness. The use of the direct recording ink-writing oscillograph lessens the work of the operator, since indefinitely long records can be taken and no time need be spent in the dark-room deciding whether further exposures are necessary. This means that less time is needed to take a good electro-encephalogram than to take a good *x*-ray picture; if necessary, head injury cases, for example, could be put through at the rate of ten an hour. Regarding the accuracy of the method in cases of cerebral tumour, a report from the Mayo Clinic[3] states that electro-encephalography alone is more trustworthy than clinical examination or air replacement alone (86% accurate as against 81% and 82% respectively). Moreover, in some instances the electro-encephalogram gave the location of the tumour where other methods had failed entirely. This amply confirms Walter's original claim of about 80% accuracy based on several hundred cases, including posterior fossa lesions, which Smith, C. W. P. Walter, and Laidlaw[4] have found to produce definite though less specific changes in the electro-encephalogram. In cerebellar cases the effect may be an indirect one on the occipital cortex by pressure through the tentorium: the signs are much more distinct in children than in adult patients.

These observations show quite clearly that in diagnosing intracranial lesions a very close approach can be made to 100% accuracy without unduly disturbing the patient, provided that all the available methods are used together. Where neurological examination fails—in tumours of the "silent" areas—the electro-encephalogram steps in, and, where the lesion is too deep or too widespread for either, air replacement can be resorted to. There is no reason why every patient should not be given the best chance which well-directed surgery can offer, and the black outlook for intracranial lesions, including injuries, may be lightened not a little by full use of modern methods.

[1] *Z. ges. Neurol. Psychiat.*, 1940, **168**, 248.
[2] *Arch. Neurol. Psychiat.*, Chicago, 1940, **43**, 547.

ADRENAL SEX HORMONES

The practical results of recent researches into the hormones of the ovaries, testes, and adrenals are now becoming widely known through the resultant easy availability of oestrogens, androgens, and corticosterone for therapeutic use. But progress in these fields has brought just as much complication as it has simplification. In the early days of the oestrogenic and androgenic hormones there was a natural tendency to assume that the former were characteristically present in women, the latter in men. But it soon became clear that this was not so, for androgenic or masculinizing hormones were found to be excreted by all normal women as well as by men, and the female oestrogenic hormones by men as well as women. From the point of view of hormone excretion the difference between the sexes is quantitative rather than qualitative, males tending to excrete more androgen than oestrogen and females the reverse. It seemed therefore that the gonads of each sex were capable of producing

[3] *Proc. Mayo Clin.*, 1940, **15**, 147.
[4] *Arch. Neurol. Psychiat.*, Chicago, 1940, **43**, 472.

the hormones of both, only the proportions being varied. Fresh complications appeared with the discovery that castrated men frequently continue to excrete sex hormones in the urine, as also do women after oophorectomy. Clearly some independent source of these hormones must be present in the body. There were already good reasons for suspecting the adrenal gland. These hormones all belong to the chemical group of sterols, and the cortex of the adrenal is known to be rich in such sterols. In the rare condition of adrenal cortical tumour the female develops a pronounced degree of masculinization with lowering of the voice, enlargement of the clitoris, and excessive body hair of male distribution. Sufferers from this condition show a relatively enormous excretion of androgenic substances in the urine, and the output of oestrogens may also be very high even in men. Furthermore, among the many substances which have been extracted from the cortex of the adrenal are several of the so-called sex hormones, including progesterone, oestrone, and androgens. These facts all suggested that the adrenal is intimately concerned with sex-hormone production. Callow, Callow, and Emmens[1] have recently been investigating the subject. In a group of eleven eunuchs they found androgen excretion in the urine to be within normal male limits in all, though the average for the group was a little lower than that to be expected in a group of normal males. Similarly in a group of eighteen women who had had their ovaries removed androgen excretion was normal in twelve, though oestrogen output was low in nearly all. It was clearly not possible to investigate sex-hormone excretion in adrenalectomized men, since the operation, even if it were attempted, is incompatible with continued life. The nearest attainable state to it is Addison's disease, and Callow, Callow, and Emmens have therefore studied this. In a series of seven cases they found androgen excretion reduced in only one. Though the extent of the adrenal damage in their cases is unknown, their results do not suggest that androgens are formed solely by the adrenal gland. These authors incline to the view that both adrenals and gonads contribute to sex-hormone production, the adrenals being the major contributor of androgens, the ovary of oestrogens. It is becoming evident, therefore, that the adrenal cortex, besides being essential to life, plays a much more important part in the physiology of sex than was suspected a few years ago.

EPILEPSY

Essential epilepsy remains a mystery, though it is progressively less a mystery than it was. The electroencephalograph is the latest method by which the problem has been illuminated, and Lennox has gone so far as to suggest that epilepsy should be called "cerebral dysrhythmia." But this explosive dysrhythmia is itself an expression of something that still eludes us. The type of rhythm which is characteristic of epilepsy is that which is associated with a localized absence of normal cortical activity. It is therefore the more interesting that sodium diphenyl hydantoinate is found to have an effect on the convulsions themselves without evidently depressing the brain as a whole, as both luminal and bromide do.[2] This suggests that, whereas the effects of the latter depend on inhibition of the spread of the excitatory process, the effects of sodium diphenyl hydantoinate may be on the excitatory process itself at its origin. It has been recorded that patients receiving sodium diphenyl hydantoinate are mentally brighter, and that the effect is reinforced by benzedrine. It is not inconceivable that the new drug works by stimulating the cortex to supply the activity that is lacking to inhibit the "idling rhythm" of epilepsy. This problem does not appear to be answered yet by the work on sodium diphenyl hydantoinate, the literature of which is summarized by Blair.[3] That sodium diphenyl hydantoinate is therapeutically useful seems very likely after making allowance for the never-failing optimism of early reports of results with any new remedy. Sodium diphenyl hydantoinate is found to be capable of reducing still further the incidence of attacks in patients who have been benefited up to a point by bromide or luminal; and, conversely, some cases appear to do better on the latter than on sodium diphenyl hydantoinate. It is said to have no influence on the mental symptoms of epilepsy. The principal disadvantage is the occurrence of toxic symptoms, chiefly of a mental and dermatological kind. At least it can be said that a new effective symptomatic agent has been discovered. It is also worth noting the method by which its efficacy was hit upon. Convulsions were induced in an intact animal by passing an electrical current through the skull, and various drugs were administered to discover which had the greatest anti-convulsant effect. Methodical investigation *in vivo* of this kind, tedious as it may appear, has thus had another success, in a way reminiscent of Foster Kennedy's discovery of the utility of quinine in myotonia. Such researches are painstaking rather than brilliant, but their systematic nature is worthy of commendation; while the possibility of using the intact animal must be welcome to the researcher in pharmacology who wishes, as he must do, to be able to apply the lesson he learns to the clinical field—that is, to the intact human animal—with as much accuracy as he can achieve.

THE MECHANISM OF HEADACHE

Though recognized as one of the commonest symptoms of many grave as well as of several trivial disorders, headache has until lately attracted little attention from the point of view of causation. This state of affairs is attributable to two causes: first, dearth of suitable methods of study, and, secondly, the inertia that from time to time clogs certain aspects of human thought and endeavour—for some of the most fruitful of recent observations have been largely amplifications of those first made by Lennander[4] in 1906 on the sensibility of the cranial cavity. The most recent contribution on this subject is by Ray and Wolff,[5] who have explored exhaustively the sensibility of intracranial and extracranial structures in thirty patients during operations under local anaesthesia: all these patients were co-operative and in a fit state to answer questions intelligently. Of extracranial structures, galea, fascia, muscle, and arteries, and to a less extent the veins, give rise to pain when stimulated in varying ways; the pain is in each instance fairly well localized to the point of stimulation. The periosteum is likewise sensitive to pain, but the substance of the cranial bones is not. The parietal dura is insensitive over the calvarium except along the course of the meningeal arteries and their main branches and the superior longitudinal sinus; the dura over the base of the skull is generally sensitive in the anterior and posterior fossae, though not in the middle fossa. The falx is insensitive to direct stimulation except near the sagittal and superior longitudinal sinuses, but pain is produced by its deflection to one or other side. Pressure on the upper surface of the tentorium cerebelli produces pain behind the ipsilateral eye, but the under surface is less sensitive.

[1] *J. Endocrinol.*, 1940, 2, 38
[2] *Psychiat. Quart.*, 1940, 14, 595, 603, 612.
[3] *J. ment. Sci.*, 1940, 86, 518.
[4] *Mitt. Grenzgeb. Med. Chir.*, 1906, 15, 465.
[5] *Arch. Surg.*, Chicago, 1940, 41, 813.

The pia arachnoid, the substance of the brain, the ependymal lining of the ventricles, and the choroid plexuses are insensitive, but the internal carotid, vertebral, and basilar arteries are sensitive, as are their anterior and middle cerebral, pontine, and posterior inferior cerebellar branches in the proximal few centimetres of their course. Inflation or deflation of a lateral ventricle causes pain probably by traction on the dural sinuses by the insensitive cerebral veins which join them. Inflation of the third ventricle causes pain which is relieved by deflation and which is attributed to traction on the adjacent arteries at the base of the brain. From these observations Ray and Wolff suggest that the headache of cerebral tumour is probably due to traction on the dural sinuses and the arteries at the base of the brain, as is the lumbar puncture headache, and that other headaches arise from dilatation of intra- and extra-cranial arteries. Their observations and conclusions are in general harmony with the suggestion made by Pickering[6] from his observations on the behaviour of different kinds of headache to simple forms of experimental procedure. It is to be noted that no evidence was found to support the idea that headache is often due to raised intracranial pressure. This theory dies hard. It is one which has been so easy to put forward and so attractive for the uncritical to accept that for many years it has held the field without any attempt at verification. But now that all the known facts about headache can be explained without its aid, perhaps it may be abandoned by serious students of the subject. Finally, it is to be pointed out that these new observations emphasize that there is no one cause of headache; many structures may give rise to the pain and they may be stimulated in a variety of ways.

ACTION OF TYPE-SPECIFIC ANTIBODY ON THE PNEUMOCOCCUS

The effectiveness of type-specific serum in the treatment of pneumococcal pneumonia is well established, but the action of the serum on the pneumococcus and on the pulmonary lesion is by no means clearly understood. It has been suggested by a number of observers, including Kline and Winternitz,[7] Wang and Van Allen,[8] and Fox,[9] that anti-pneumococcal immune bodies could not penetrate into the pneumonic lesions produced experimentally in rats. The problem has been reinvestigated by Kempf and Nungester,[10] who, using horse and rabbit antiserum, were unable to demonstrate antibody in the lungs after intravenous injection. They therefore concluded that it was unlikely that antibody could accumulate in the consolidated areas of the lung in sufficient concentration to neutralize the specific polysaccharide present in the alveoli. Nye and Harris,[11] studying human material at necropsy, reached the same conclusion. Opposite results have, however, been obtained by Barry Wood.[12] Experimental lobar pneumonia was produced in white rats by inoculation of encapsulated Type I pneumococci suspended in mucin, the subsequent pneumonia being invariably fatal within five days. The most striking feature of the process of spread was the presence at the advancing margin of what has been termed "the oedema zone" (Robertson *et al.*[13] and Gunn and Nungester[14]). The pneumococci were most numerous in this region, and histological examination of the lungs at intervals of from twelve to thirty-six hours after inoculation showed that the pneumococci spread into normal alveoli principally by way of the oedema zone. The action of type-specific antibody upon the advancing lesion was observed in rats treated from two to eighteen hours after inoculation with pneumococci. At first 6,000 units, contained in 1 c.cm. of concentrated anti-pneumococcal rabbit serum, were injected intravenously, but later it was found that the same result could be obtained with as little as 120 units. Six to eight hours after treatment the margin of the consolidated area had become sharply demarcated, in striking contrast to the irregular haemorrhagic border characteristic of an advancing lesion. Microscopically there was pronounced agglutination of the pneumococci, particularly in the oedema zone, within an hour of treatment, while organisms with swollen capsules were frequently noted. Following the agglutination and swelling of the pneumococci invasion by new alveoli ceased, phagocytosis by polymorphonuclear leucocytes began within six hours, and few, if any, organisms could be found either extracellularly or intracellularly within ninety-six hours of the beginning of treatment. The macrophage reaction became prominent in four days, and at the end of one week extensive clearing of the exudate was noted. It is therefore believed that type-specific immune bodies actually enter consolidated pneumonic areas in the lungs.

HISTAMINASE

Much evidence, as yet hypothetical, suggests that the liberation of histamine or a histamine-like substance in the tissues at the site of an antigen–antibody reaction is the immediate cause of anaphylactic symptoms. Destruction of histamine in the body may in part be brought about by an enzyme called histaminase, found in relatively large amounts in the kidneys and in the wall of the large and small intestine, and in moderate amounts in many other organs.[1] Diamineoxydase[2]—to give it its chemical name—has been prepared commercially (torantil) from the above sources, generally hog's kidney, and has been recommended in the treatment of allergic conditions. It is given orally in enteric-coated tablets and also intramuscularly; each tablet or ampoule is said to be capable of detoxicating a certain number of histamine units. Most communications on the subject deal with its use in allergic dermatoses and in cases of cold allergy. Laymon and Cumming[3] obtained some benefit in cases of urticaria, but they question its value in general. Miller and Piness[4] gave histaminase to twenty-nine patients with urticaria, five with dermatitis, five with asthma, and three with hay-fever. They found that the enzyme failed to give unequivocal evidence that it was in any way responsible for relief or prevention of any of the patients' symptoms, nor did it prevent urticaria after the administration of a pollen or epidermal allergen. Goldberg[5] found it useful in alleviating pruritus, especially in chronic urticaria and when injected. It was first successfully given in cases of cold allergy by Roth and Horton,[6] but Baker[7] in two similar cases used in addition gradual desensitization to cold by immersion of the hands in cold water. Kile and Rusk[8] report a case of cold urticaria in which histaminase was tried without success. Foshay and Hagebusch[9] found that it alleviated the pruritus of serum

[6] *British Medical Journal*, 1939, **1**, 907.
[7] *J. exp. Med.*, 1915, **21**, 311.
[8] *Proc. Soc. exp. Biol. N.Y.*, 1933, **30**, 814.
[9] *J. Immunol.*, 1936, **31**, 7.
[10] *J. inf. Dis.*, 1939, **65**, 1.
[11] *Amer. J. Path.*, 1937, **13**, 749.
[12] *Science*, 1940, **92**, 15.
[13] *J. clin. Invest.*, 1933, **12**, 467.
[14] *Arch. Path.*, 1936, **21**, 813.

[1] *Physiol. Rev.*, 1931, **11**, 371.
[2] *Schweiz. med. Wschr.*, 1938, **68**, 1318.
[3] *J. Invest. Derm.*, 1939, **2**, 301.
[4] *J. Amer. med. Ass.*, 1940, **114**, 1742.
[5] Ibid., 1940, **115**, 429.
[6] *Proc. Mayo Clin.*, 1937, **12**, 129.
[7] *J. Amer. med. Ass.*, 1940, **114**, 1059.
[8] Ibid., 1067.
[9] Ibid., 1939, **112**, 2398.

sickness, while Roth and Rynearson used it with success in allergic reactions to insulin.[14] Keeney[15] administered it orally to fifteen sufferers from ragweed hay-fever with no effect. It is thus obvious that there is no clear-cut case for histaminase having any beneficial therapeutic effect in allergic diseases, except perhaps in cases of chronic urticaria, but as in this condition long and irregular intermission of symptoms is by no means uncommon any true beneficial result is hard to estimate. These findings are in accord with a recent note by Best and McHenry[16] who draw attention to the fact that when they summarized the work on histaminase in 1931 they pointed out that the presence of the enzyme in various tissues may constitute one of several defence mechanisms of the body for the inactivation of histamine. No suggestion was made that its administration might be a useful form of treatment. In fact, laboratory investigations showed that (1) histamine administered to animals over several weeks or in a single large dose had no effect on the histaminase content of the kidneys; (2) histaminase is inactivated by pepsin in acid solution and trypsin in slightly alkaline solution, so if given orally it is unlikely to survive the action of the proteolytic enzymes of the gastro-intestinal tract; and (3) the intravenous or intramuscular administration of histaminase failed to have any effect upon histamine present in the body or on that given by injection, even using preparations four times as potent as any commercially available.

HEALTH IN ICELAND

Perhaps few countries struggle against greater natural handicaps than Iceland. This remote island in the far north, with its severe climate and poor soil, can, however, show a record of health progress which does great credit to the inhabitants. Almost until the end of last century the child death rate was very high, and epidemics of such diseases as measles, influenza, and whooping-cough were rife. Towards the end of the century, however, a general revival of interest in both secular and spiritual matters brought with it a campaign to improve the health of the people. In the last fifty years the population has increased by about 70%. The Government has taken an active part in health measures, and has built up a comprehensive sanitary code. From being a short and stunted people the Icelanders have now become the tallest of all the Scandinavians, and their resistance to disease has increased considerably. The endemic conditions of leprosy, hydatid disease, and tetanus in young children, for which the island was once notorious, have nearly disappeared. Typhoid has not been completely exterminated, but its end is in sight. Diphtheria, formerly a plague among children, has done little damage since serum treatment and immunization were introduced. The death rate among children is now one of the lowest in the world. Rheumatic fever is rare. Since 1918 influenza has been epidemic for about three months in every other year: in the intervening years the population seem to be almost immune. The most important disease from the public health point of view is tuberculosis: this has made its way over the country like a protracted and difficult epidemic, which all the efforts of the authorities have been unable to check. Since 1933, however, a steady diminution in the incidence of tuberculosis has been recorded. Gonorrhoea is endemic in the towns, but syphilis is very rare and in most cases the infection is imported; soft chancre is unknown. The islanders seem to observe a somewhat large sexual freedom, for the figure for illegitimate children is about 20%; on the other hand, prostitution hardly exists at all. The incidence of certifiable insanity is rather high—3.5 per 1,000—especially as there is next to no post-syphilitic lunacy; the commonest form is manic-depressive insanity. Mental deficiency affects 2 per 1,000 of the population. In spite of rigid control of the consumption of alcohol by the State, it is being increasingly drunk, and causes anxiety to the health authorities. In his recent survey of the health conditions of the island,[1] Dr. Vilmundur Jonsson says that much remains to be done, but that the general standard of fitness may be expected to increase. Greater interest is being taken in sport and mountaineering, more fresh food and vegetables are being consumed, the islanders are drinking more milk, and an interest in health and its maintenance is becoming general. He sees no reason why, if the Icelanders retain political independence and financial stability, the nation should not become permanently one of the healthiest in the world.

ANTI-ALOPECIA FACTOR

Woolley[2] has shown that when young mice were fed on a diet consisting of sucrose, purified casein, salts, cod-liver oil, corn oil, yeast extract, thiamine (aneurin), riboflavin, vitamin B_6, nicotinic acid, pantothenic acid, choline, and *p*-alanine, they ceased to grow after five to six weeks, and quite suddenly all the hair except that on the head, tail, and occasionally the legs fell out. The denuded area gradually became scaly and red, and sores soon developed. Aqueous liver extract restored the mice to normal in three to seven days. The most active part of the extract was that insoluble in 70% alcohol. This fraction did not promote the growth of rats, lacking only the "filtrate factor," which indicates that the "filtrate factor" contains at least two substances—one necessary for the growth of the rat, and one for preventing alopecia in mice. The active substance was not easily adsorbed on norite, nor was it dialysable until treated with barium hydroxide and lead acetate. It is not biotin, nor *p*-aminobenzoic acid. The ether extract of the alcohol-soluble portion of liver extract was inactive: therefore the alopecia factor is not the anti-grey-hair factor. Recent work indicated that the factor might be a phosphoric ester of inositol, and cereal grains known to be good sources of this compound were found to be good sources of the alopecia factor. Phytin, inositol phosphoric acid, and also inositol itself were therefore tested and found to be very potent, the dose of either required to cure severe cases being about 100 mg. per 100 grammes of ration. When the non-dialysable alcohol-insoluble portion of the liver extract was autoclaved with alkali, crystals were obtained which had a melting-point of 214–216° and a carbon content of 39.8%. Inositol obtained from a different source had a melting-point of 215–216°. Thus it seems that in the mouse inositol or some derivative of it acts as an anti-alopecia factor.

The medical profession of this country has heard with deep regret the announcement that Sir Frederick Grant Banting, F.R.S., F.R.C.P., Hon. F.R.C.S., joint discoverer of insulin, and since 1923 Professor of Medical Research in the University of Toronto, has been killed in an aeroplane crash in Trinity Bay, Newfoundland. The flight on which he and two companions lost their lives was made in connexion with Sir Frederick's research work for the war effort.

[14] *Proc. Mayo Clin.*, 1939, **14**, 353.
[15] *J. Amer. med. Ass.*, 1940, **114**, 2448.
[16] *Canad. med. Ass. J.*, 1940, **43**, 163.

[1] *Health in Iceland.* (A reprint from the Report on Public Health in Iceland, 1938.) Reykjavik, 1940.
[2] *J. biol. Chem.*, 1940, **136**, 113.
[3] *Science*, 1940, **92**, 384.

THE EMERGENCY MEDICAL SERVICE AND THE FUTURE*

BY

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I shall not tax your memory to any great extent, but ask you to return to a very recent time—September, 1938—Munich.

The threatening clouds disappeared and we for a time relaxed, but the memory of those days had left a bitter taste in the mouth, and the medical profession stirred uneasily at the thought of what might have been, and what perhaps was to come. As the months passed no signs could be seen of any attempt to deal with the casualty problem on the part of those in authority. Early in 1939 a meeting of representatives of the staff of the London teaching hospitals was arranged under the title of the Hospitals War Committee. It was decided then to ask the Voluntary Hospitals Committee to combine and meet the Ministry of Health to hear what arrangements were being made in connexion with the medical services if war should break out. As a result of deliberation the Ministry put forward tentatively its Sector scheme whereby twelve members, one from each of the teaching hospitals, should be selected to advise the Ministry on hospital arrangements in the London area in the event of war, and link the teaching hospitals to its casualty scheme.

Planning the E.M.S.

As soon as contact was made with the Ministry it became clear that much work had already been done in relation to dealing with the problem, not in detail but in rough outline. England had been divided into Regions, each independent of the others, so that districts would be able to carry on the functions of life if cut off from the rest of the country; each had its own Commissioner with staffs superintending all services, and, among others, a Hospital Officer to deal with the medical problems. London alone presented a special problem on account of its size and vulnerability from the air, further complicated by the fact that it had so many hospital beds in proportion to those in the Home Counties. A rough census of the beds available, and buildings suitable for use as hospitals, outside London had been made, and although in the majority of instances these numbers were optimistic they formed a foundation on which it was possible to work. Such were the beginnings of a Service.

The Ministry of Health was relying on its Hospital Officers to co-ordinate the arrangements in each region, making use of the County Medical Officers of Health as its agents. The introduction of the Sector system in the London Region complicated the picture, and very naturally the M.O.H.s must have questioned the appearance of these strange creatures, the Group Officers, in their pond, but their good will overcame many difficulties and misunderstandings. As time went on, and especially after the outbreak of war, their assistance and knowledge were placed freely at the disposal of the Group Officers and went very far to make the Emergency Medical Service.

In those months before the war there was a great deal of work to be done: the buildings, institutions, and hospitals outside London that had already been earmarked were visited; and, together with the committees or local authorities in charge, arrangements were made, and schemes drawn up, for their expansion in case of war. Many difficulties were encountered by reason of the fact that these buildings were carrying on their peacetime function, and considerable dislocation of those functions would have taken place if the alterations planned had been put into being before war broke out. In consequence such matters as new theatres, *x*-ray departments, and nursing-staff accommodation remained paper schemes, and with few exceptions were not started before the war. The result was that in September, 1939, when these hospitals were required, staff quarters were short or uncomfortable, and essential services were inadequate. It is difficult to know how this could have been altered, unless the hospitals had been put on a war footing six months or more before war broke out, and remembering the temper of the Government and the people at that time it was not practical politics.

During this period the Group Officers met once a week in London (with officials from the Ministry) and the minutes of those meetings are interesting reading. The whole range of an emergency service was explored, and agreements were come to on every possible point that might arise in connexion with such a scheme. Very early in the discussions it was clear that the number of beds provided would be inadequate if the astronomical figure of casualties given by experts was to be taken as a guide. Those figures we know now, for a variety of reasons, were fortunately too high, but they were figures for which we had to legislate. Existing beds in provisional hospitals were inadequate, and the Ministry decided to put up hutted hospitals, using in most instances the administrative services of existing hospitals or institutions. This was work that did not have to wait, but could be put in hand at once without causing dislocation of existing services. Any delay in the building of such huts was due to administrative difficulties very real in peacetime, but not so readily understood in our present mood. These huts were not ready until after war had broken out, and a second expansion of hutted hospitals was seriously interfered with by difficulties in obtaining suitable material. Arrangements were also made for certain groups of beds, or individual buildings, to be reserved as special centres or hospitals.

The beds provided have been more than adequate for the requirements of the casualty service, but it is fortunate that so many beds were provided, because in the sequel the calls on the E.M.S. were very diverse, and the excess of beds allowed for an expansion in its services—services that were not envisaged in the original scheme.

Equipment and Staff

Other major problems were those of medical supplies and equipment, and the chief of these were surgical instruments and *x*-ray apparatus. As regards the first, lists were prepared and, with the assistance of the Consultant Advisers, approved. The instruments to be provided were for a casualty service, and no attempt was made to provide the more elaborate surgical equipment that is required for civil practice. It must be remembered that for years past surgeons had been using nothing but hand-forged instruments. Hence the surgical instrument makers of the country were unable to provide suddenly large quantities of mass-produced instruments, and considerable difficulties were encountered in obtaining the enormous quantities needed for the E.M.S. at the same time that the requirements, always large, of an expeditionary force had to be met.

The second—the *x*-ray problem—was even more difficult. It became evident early in our discussions that *x*-ray apparatus was very short of requirements for the expanded number of beds, and that it was an essential of any casualty service. It was decided that most hospitals would have to be served with portable machines, as it was not thought possible that fixed machines could be moved out of London in time, even if the necessary technicians for dismantling and reassembling the machines were available. This decision was come to because it was supposed that on the outbreak of war London, being an obvious target, would be bombed at once. In the sequel this was not so, and readjustments had to be made to house fixed sets which became available, not only from manufacture in this country but also from America. By the generosity and patriotism of the voluntary hospitals large amounts of equipment were made available, especially from the London hospitals. There can be no doubt that this equipment made it possible for many emergency hospitals to function on the outbreak of war. Transport also came under review, and here it

* Presidential address (abridged) given to the Section of Surgery of the Royal Society of Medicine, February 5, 1941.

was found that arrangements were already under way not only for transporting casualties from the scene of the incident but also for interhospital evacuation, and this plan is the one in operation to-day.

During the whole of the discussions the question of staffing the emergency hospitals was constantly reviewed: this fell into three categories—medical staff, nursing staff, and lay staff. The lay staff formed two groups: expert lay staff, such as theatre porters and technicians, and ordinary domestic staff and porters; the first clearly had to be provided from the voluntary hospitals, the second was the concern of the local authorities owning the hospitals. Nursing staff was a large problem, and it was quite clear that the staffing of the increased beds would not be done on a peacetime basis, and that even on a reduced scale there would be considerable shortage, as has proved to be the case. In order to help with this problem Sector Matrons were appointed, and a pool of nurses from the various hospitals was made, including the L.C.C. hospitals in London. These nurses were allocated to the emergency hospitals, together with members of the Civil Nursing Reserve, a new body which was to be enrolled as a war-time measure. Outside London the arrangements for nursing were in the hands of the Regional Hospital Officers and the County Medical Officers of Health.

The medical staff requirements were not so easily arranged on paper. Requirements for each hospital differed according to their position geographically and the type of work that was likely to be undertaken. A rule-of-thumb method could be employed for the house-officer type, but not for more senior grades. Every department of medicine had to be catered for in one hospital or another, and an attempt made to co-ordinate the services of each department, without overlapping. Here, then, was the outline of a Service—a new Service to deal with a new problem: the treatment of civilian casualties due to enemy action. Never before in the history of the world had it been considered necessary to cater for such a contingency

A New Problem and a New Service

All the experience of the Ministry of Health had been in peacetime associated with health problems, and its only contact with hospital affairs and those actively engaged with hospital practice had been through its agents, the County Medical Officers. In starting this new Service the Ministry very correctly harnessed it to the existing civil practice, including the voluntary hospital system, but, however much it could rely on these systems, it had to take decisions without previous experience of many of the problems. There was bound to be, there could not help being, a certain rigidity, a bureaucratic tendency to procrastination that to many people appeared unforgivable in such a crisis. The apparent dilatoriness in coming to decisions was in some cases correct, experience and time showing that the requirements suggested were in fact not necessary. The Ministry's difficulties were indeed great, and it was hampered by its very slight knowledge of the very complex problems associated with hospital management. In many respects the schemes were well thought out and well carried through, and I might instance one. Just before the outbreak of war the Ministry came to a financial arrangement with the voluntary hospitals for possible casualty services. A fortnight after war broke out the individual hospitals received their first payment.

When war did eventually come the E.M.S. came into being, the upgrading in the hospitals was at once begun, and staff, both medical and nursing, reported to their hospitals. That the confusion was not greater was really remarkable. The staffs of the London hospitals had uprooted themselves, the old values had disappeared overnight, and they found themselves in strange surroundings, trying to adjust themselves to new conditions. Their clinical work had disappeared and there appeared no immediate prospects of their having any to do. As they looked round their new quarters the scene appeared bleak, and the theatres and wards among which they found themselves rudimentary, with an almost complete absence of those efficient arrangements which had been so much part of their life that they had never stopped to inquire how it had all been done and how many years of planning and forethought, with the expenditure of large sums of money, had gone to produce the ordered effect to which they had been accustomed. After the first shock they started with the greatest good will to reproduce in these new hospitals a replica of the old. The Emergency Medical Service owes a tremendous debt to its medical officers and nursing staffs for the way in which they dealt with this situation: the energy expended was immense and the results dramatic. Criticism there was, but it was chiefly constructive, and difficulties and deficiencies were overcome frequently by the critics themselves. The next few months are known to you all. Instead of civilian casualties there was a lull, and London, instead of being emptied, carried on almost normally; this meant for the medical profession that the civilian sick returned to the out-patient departments of the hospitals and arrangements had to be made for their treatment. Readjustments had to be made, and the Ministry decided to transfer cases requiring treatment into the Sector hospitals. These hospitals were not equipped for peacetime work and the influx of civilian sick meant further improvement in the equipment of all departments. This process had to be a gradual one and still goes on, and the civilian sick continue to be treated in the Sector hospitals.

Certain hospitals throughout the country were earmarked as convoy hospitals, and to these hospitals the Army sick were brought from France, but it was not until the Germans invaded the Low Countries that any wounded were received, and not until the retreat did the E.M.S. have to deal with any large numbers of wounded. With the evacuation of the Channel ports large numbers of casualties were treated and the efficiency of the medical service was tested, and I think we can say that it stood up to that test, and the surgical work done—it was chiefly surgical work—was well done. Any criticism there might be arose from the fact that some medical officers were not aware of the great facilities of the Service, and had the feeling that if a case came into their hospital it was up to them to treat it and see the case through, rather than have it transported to another hospital further afield where there was less crowding or better facilities for special cases.

In August and September air raids on open towns started in earnest and civilian casualties had to be treated, thus fulfilling the original purpose for which the E.M.S. had been created. Despite the fact that in these raids large numbers of hospital beds were put out of action by bombs, no undue strain was ever put on the numbers remaining; more than that, the emergency hospitals were able to continue treating the civilian sick and help to deal with the large population of chronic sick that had been evacuated from damaged hospitals in the target areas.

It might be said that this was as it should be, that it had a year on war footing in which to prepare, but a year is a short time to build up such an edifice. The Army, Navy, and Air Force had had a long time to build up their medical services, and their duties were defined; but, as I have tried to show, the Emergency Medical Service had constantly to take on new duties and adapt itself to fresh calls. Almost every three months some major event determined new duties, but such was its elasticity that it was able to meet them and gradually consolidated its position.

Decentralization of the Urban Sick

There are those who have said that someone, it was never quite stated who, invented the Emergency Medical Service as the beginning of a State Medical Service. I do not think that this is true: in some ways I feel sure that the last thing that the Ministry of Health wanted was to be saddled with any such project. Nevertheless the E.M.S. had not been functioning very long before it became clear that a new conception in the medical service had come into being almost overnight. The idea of decentralizing the treatment of the urban sick was not new, it had been advocated for many years; in fact whenever one of the large London hospitals was due for rebuilding many suggestions would be made for its removal from the old site

further out into the periphery, but only in one case—that of King's College Hospital—did the hospital authorities, before the last war, carry through such a project, and more recently a provincial city has removed its hospital service outside the centre. The reasons that prevented such a movement were, among others, the difficulty of getting patients to consent to go out because their relatives would not be able to visit them and the possible difficulty in connexion with the consulting staffs. These have not proved insurmountable. The patients in the Sector hospitals are still visited by their friends, and the consulting staffs have found that travelling to and from the Sector hospitals has not been so difficult to arrange as was anticipated. It would therefore seem that the principle of keeping a small hospital in the centre of the urban district, with an adequate out-patient department, and transferring the sick to a peripheral hospital situated in a green belt outside has been proved.

We now have something to guide us in the future. In the planning of the whole emergency service mention has been made of the regional system. The Minister of Health has already, in connexion with the Nuffield Trust, seen the increased possibilities that are opened up by this war-time measure. It would be fair to say that in our large cities and towns the sick have been well looked after in the past, but there has been overlapping and reduplication of many services, with consequent waste of money and effort.

In the country districts conditions are not so satisfactory in respect of treatment of the sick. Enlightened and perhaps richer counties have taken advantage of the Hospital Act, which permitted them to set up an adequate hospital service in their areas; others have not been so forward, and adequate facilities in these have had to depend on small voluntary and cottage hospitals that had nothing like sufficient accommodation and could only deal with the fringe of the problem.

The difficulties facing regional control are undoubtedly great, for the regions include several counties and borough councils, so that a new method of control, both provincial and other, will have to be evolved, the county control disappearing, but it would be unthinkable not to make use of the enormous experience of the County Medical Officers and their staffs in any such scheme; the work they have done in the past in the evolution of the present county hospital system has been immense.

The fallacy of all policies connected with medical services is the position of the doctor in the social scheme. We have trained the lay public and ourselves to regard our position in the economic structure as that of a consultant. Some change in this outlook will have to come. Medical men from time to time will have to be given some kind of executive authority and the medical profession will have to be ready and willing to assume that authority, so that medical measures for the improved health of the nation are not left to county hospital committees.

Sketch of a Regional Scheme

Let us for a moment sketch in very broad outline a picture of what such a regional scheme might look like. A series of small hospitals with full out-patient departments in the urban districts; outside these districts in a green belt one or more large central hospitals providing accommodation and facilities for all specialties and dealing only with acute sick on the same pattern as the large voluntary hospitals that we know to-day. Further afield, depending naturally on geographical circumstances, a number of satellite hospitals receiving the more chronic type of cases, such as tuberculosis, those cases known as the chronic sick, and in each region convalescent homes for children and adults. Let us now trace one or two cases typical of the hospital patient of to-day and see how they would fit into such a scheme. A patient with gall-stones or cancer would seek advice at an out-patient department and be seen by the appropriate consultant, who would advise hospital treatment. The case would be admitted centrally and transferred to the large acute hospital to one of the consultant's beds in that hospital. After investigation and appropriate treatment the patient would be sent for convalescence, or, if inoperable, to his own home or the satellite hospital for the chronic sick. With another, a patient with tuberculosis, the same procedure would be adopted; he too would be sent for investigation and treatment to the larger hospital or direct to the satellite sanatorium. The acute case would be dealt with at the urban hospital, but the patient would be transferred to the periphery as soon as he was fit to travel.

At this point someone will say, "But this is a State Medical Service," and at once sinister thoughts creep in about the curtailment of that liberty for which we are supposed to be fighting. I would say that this was a State service, a proper State service, but it would be no more than what the Emergency Medical Service is attempting to do to-day with a free medical profession. Such a scheme has to be harnessed to finance, and it is here that the profession becomes nervous, believing that money means not so much control as interference. This need not be so. In the past the medical schools have been given large grants of money through their universities, but there has been no interference with the way individual schools have carried on their affairs. That the money granted should be spent in a proper manner is all the control that has been asked or granted, the school authorities being allowed to carry on their activities as they thought proper; no doubt the presence of these grants does mean that a broad general plan is followed, but that is not interference. In such a regional scheme as has been outlined some similar system of linking the financial problem might well obtain. It has already been suggested that the voluntary hospitals might have their resources pooled under a Hospitals Corporation, on lines like those of the British Broadcasting Corporation. The suggestion might go further by pooling all money that to-day goes to the hospital services, under a National Medical Corporation, or some such body.

Surgeons of the Future

In such a scheme as this surgery will play a large part, and the surgeons of to-day should be stirring and asking themselves how they stand; they are particularly fitted for such a task. Their minds are not warped by the destruction that is going on among the nations to-day; they are continuing their work of healing, and when peace comes they will not have to wrench their professional minds back from destructive to constructive effort in the way other walks of life will have to do. It is right, then, we should ask ourselves how we can improve the surgery of the future in any reconstruction that takes place. Many more surgeons will be required if the surgical work of the nation is to be properly done. It would seem to some that the haphazard ways of the present might be improved on, that we should ask ourselves what constitutes a surgeon. Is a surgeon a man who goes out into a country district and calls himself a surgeon, or is he a man who takes a higher qualification in surgery? Broadly speaking, neither: the first may fail from lack of knowledge, the second from lack of judgment. He should be a man who in the opinion of his teachers has enough knowledge and experience to undertake surgery, who has served an apprenticeship in surgery. The carpenter and the cabinet-maker work in the same medium, yet the one requires a different apprenticeship from the other, and we expect a more finished class of work from the latter.

We must ask ourselves, then, if these surgeons of the future should not have more experience under recognized teachers after their final surgical examination, and whether such men going out into the country under such a scheme should not be responsible for the regional surgery of the future, perhaps chosen by a committee of the College of Surgeons. In this connexion I should like to make one observation about the teaching of surgery. As one sees more and more of surgery one never ceases to be astonished at the recuperative and healing power of the human body. We are seeing this almost daily in war casualties: men and women with wounds that seem as though they must kill, or cripple the patient for life, recovering almost full function. We as surgeons have to inflict wounds on

patients. We should see to it that we do not take advantage of this astonishing phenomenon of human recovery, but that we recognize it humbly as an aid to our art, and that we teach our assistants to treat it in the same way, so that when they leave us they go out with judgment and gentleness as good surgeons.

At this moment, waiting as we do on the edge of a volcano, waiting for the church bells to ring out not war and peace but war and destruction, it may seem difficult to turn our minds to the future, but we all desire that that future should be better than the past, and we must see that whatever reconstruction takes place the individual character of British surgery is maintained for [illegible] character which is one of its greatest possessions.

CANCER RESEARCH IN WARTIME

REPORT OF EMPIRE CANCER CAMPAIGN

The seventeenth annual report of the British Empire Cancer Campaign, which was presented and adopted at the annual meeting, seems to have exceeded [illegible] wartime attenuation, and its (nearly) three hundred pages are filled with information from forty or more research departments at home and overseas. Appeals on behalf of the Campaign ceased on the outbreak of war, and cancer research, so far as it can be kept going is financed out of capital funds. Thanks to this policy, all the more important investigations have been continued and [illegible] able work is being done.

Carcinogenesis

Several of the research centres make reference to investigations on carcinogenic substances. In one experiment undertaken in the department of experimental pathology of the University of Leeds the morphology of one hundred and sixty tumours induced by carcinogenic hydrocarbons in the subcutaneous tissues of mice has been investigated. As was to be expected, sarcomata preponderated, but twenty-three examples were found of adenocarcinomata, nine of them unassociated with other types of growths. These tumours occurred only at the site of injection of the hydrocarbon, and from their histological appearance were directly to be attributed to its action. Such an occurrence has not previously been described. At the Chester Beatty Research Institute of the Royal Cancer Hospital evidence has been obtained which confirmed the theory that extracts of some human livers produce sarcoma in mice. Eleven such tumours have been obtained with four different groups of extracts.

A report from the Oxford University Research Centre of the Campaign summarizes the present position of the role of irritation in carcinogenesis by classifying skin irritants into five categories: (1) chemical (namely, the highly specific hydrocarbons); (2) physical, including such agents as x rays and ultra-violet light; (3) anti-carcinogenic irritants, such as mustard gas and croton oil; (4) co-carcinogenic irritants, such as croton oil, which, though not in themselves carcinogenic, augment the tumour-producing action of carcinogens; and (5) non-specific irritants, including the great majority of skin irritants.

At other research centres, notably Leeds, the part which heredity may play in cancer, both in man and in animals, continues to be studied. A Yorkshire inquiry, which took cognizance of over 400 family groups, has not so far—it is still incomplete—revealed any striking evidence to suggest that heredity plays an important part in breast cancer in women. On the other hand, some work from Holland is quoted, relating to 660 family groups, in which it has been found that the female relatives of women with breast cancer suffer from this disease very much more frequently than do the rest of the female population. It is pointed out that, although it has been known for some time that heredity can influence the incidence of breast cancer in mice, this should not be applied too closely to the problem in man, because the conditions of mating necessary to demonstrate the effect in mice—for example, very close inbreeding, necessitating brother–sister mating—never obtain in any civilized community.

Clinical Research

A large section of the report is taken up with an account of the work of the Clinical Research Committee, which was started by the Campaign three years ago. By the co-operation of a large number of individuals the cancer cases registered at all or nearly all the London hospitals have been taken and tabulated, with a view to bringing out age and sex distribution, incidence of carcinoma of the breast in parous and non-parous women, effect of treatment, and innumerable other points. The results should prove of great value when sufficient time has elapsed, because here is a pool of unselected cases, registered by comparable stages as recorded at the time of examination, and showing the proportion unsuitable for treatment when first seen.

It would be as well to describe fully the basis of the method in these successive annual reports, for it is assumed that the reader of this report is familiar with the method of recording and tabulation first described in the report for 1939. Moreover, in the general summary, which gives the site of the cancer in the 7,872 cases that have been coded and states that 2,915 are still living, there is no indication of the survival time. In several of the dissected tables, such as those concerning the family history of breast cancer, the relation of breast cancer to the number of children and miscarriages, and also to lactation, the high percentage of cases in which it has to be admitted that the particulars were not stated makes it impossible to draw any useful conclusions from the figures. It is hoped to eliminate these statistical errors in future by a more detailed questionary. The analyses in this report relate to breast cases and to mouth cases. With regard to the latter, which accounted for 6 % of the total number of cases registered, it is shown that carcinoma of mouth and pharynx is predominantly a male disease, and that the incidence is very low up to the age of 50.

Much other work is referred to, including experiments in radiation, dosage measurement, and neutron research. At St Bartholomew's Hospital the million-volt x-ray apparatus has been running at the full since February, 1939, and over 150 patients have been treated without mishap. Under the auspices of the Radium Beam Therapy Research the construction has begun of a pressure-insulated electrostatic generator and x-ray tube which is planned to reach an output of two million volts.

The Duke of Gloucester's Tribute

At the annual meeting of the Campaign Lord Hailsham, the Chairman of Grand Council, read a speech by the Duke of Gloucester, the President, who was prevented by military duties from attending. His Royal Highness said how glad he was to learn that neither the difficulty of ensuring the adequate provision of funds which cancer research required nor the direction of the efforts of skilled research workers into other channels had prevented admirable progress being made both in London and in provincial centres. The list of grants made to research centres by the Campaign at headquarters alone amounted to over £34,000 for 1941, or £2,000 more than last year.

C. C. Ling, S. S. Taur, P. C. Heuer, and S. Y. Yang (*Chinese med. J.*, 1940, **57**, 11) performed 110 sternal punctures and an equal number of blood cultures on typhoid and paratyphoid patients and found that, as compared with blood culture, sternal puncture yielded a distinctly higher percentage of positive results, and, owing to the heavier infection in the bone marrow than in the blood, culture gave a more rapid and abundant growth.

CIVILIAN MORALE: MEDICAL ASPECTS

A meeting of the Paddington Medical Society was held on February 11, when Dr. A. BALDIE gave an address on some medical aspects of civilian morale and crime in wartime.

Dealing first with crime, Dr. Baldie said that in spite of new wartime offences and of the opportunities for looting and disorder which black-out and raid conditions presented, there had been less crime during the past winter. Crimes of violence in particular had diminished, owing to the inhibition of social activity as a result of air raids. The evacuation of large numbers of children seemed to have lessened juvenile delinquency, although the occurrence of child neuroses was more noticeable among the children who had been evacuated than among those who remained in the cities. Another factor to be considered was the drafting of large numbers of young persons of both sexes from civilian into Service life, a factor which at present had led to a reduction in sexual and other offences, though ultimately the effect might be the other way. Kleptomania was more prevalent than the reported proceedings in police courts might lead the public to believe.

Turning to a wider field, Dr. Baldie said that doctors were faced at present with many problems of group and communal life, the solution of which depended upon the application of medical and ancillary sciences; these were problems touching on nutrition, adequacy of rest, personal and social hygiene, and occupational efficiency. Such matters as sanitation and medical inspection lost a great deal of their value so long as people in industry were wrongly placed, had insufficient hours of sleep, and had to travel long distances to work. Mass anxiety was one social danger which could be avoided if it could be foreseen, or controlled if it occurred. Among the defences against such anxiety a return to religious belief might be one of the most effective for some people. The influences of ideologies of one kind or another had been somewhat demoded by the war. No doubt education in the fullest sense of the term was called for if the people were to have an understanding and appreciation of what was at stake. The stoic endurance of Londoners during the period of intensive air bombardment was a matter for pride. Dr. Baldie gave an analysis of mass anxiety, its successive phases, its possible development into panic, and its remote effects, such as the persistence of the hiding and shelter habit. There were many who were immune from the habit of going underground, though perhaps in some cases this was due to a previous claustrophobia, but there were others who at the first alarm resorted to the shelters, persistently returning there in spite of a series of quiet nights, and suggested the attitude of the escapist whose only use for life was to avoid it.

In all these conditions where there was an aggregation of people in small spaces in various conditions of emotional tension the doctor had the opportunity of serving his patients by persuasion and suggestion as well as by more peremptory action. It was important that he and all those who had to deal with groups should understand the nature and significance of habit and behaviour in an abnormal environment, and particularly the morbid reactions of one individual upon another. Such understanding might prevent in many cases months and years of neurotic disability. It was well to remember, too, that even acute panic reactions were not major diseases and did not require removal beyond the range of immediate danger. The value of activity as an antidote to fear had been confirmed in practice. Fear and pessimism were more likely to affect those who were doing nothing.

Finally, there was the need for right leadership. Dr. Baldie gave a long list of qualities desirable in a leader: physical health and fitness, intellectual and technical ability, integrity (corresponding closely to what the psychologist meant by integration), alertness and attention, and ease and quickness of response, a sense of justice, a capacity for sympathetic imagination, resoluteness, equanimity, a sense of humour, and a concise and effective philosophy which could be expressed in a few sentences. If there was any one defect from which the vast organization of civil defence suffered it was not in the incapacity of its leaders, but in the fact that owing to the swiftness with which it had to be brought into being many of the leaders had so far not found their *métier*.

In the discussion Dr. Baldie further explained his reference to the defensive value of religious belief. He was concerned that the strong suggestive value inherent in such belief should be available for the comfort and security of those who could possess it. No doctor, of course, would insist that his patients must be religious, but to some people the comforts of religion were very real.

Dr. G. DE SWIET, from the chair, differed a little from Dr. Baldie in his conception of leader. In his view the leader must be the embodiment of average characteristics, with a good deal of greed, conceit, and verbosity. Not a little of the strength of this country, he said, was due to the fact that owing to the constitution of our people the question of leadership was not so essential as it was in some other countries, and change of leadership did not entail revolution.

MOBILE HOSPITAL FOR FREE FRENCH FORCES

One of the exciting escapes from France last summer was that of the Hadfield-Spears Ambulance Unit. It disappeared when the Germans occupied the country, but the members, though minus their equipment, turned up in England, followed their French comrades to camp, and resumed the care of the men they had been in France to serve. At General de Gaulle's training camp the unit has been running a hospital and canteen, and two other canteens for the Free French Forces in London have been under its control.

The unit has now got together a complete ambulant hospital for service in Africa. It can be unpacked and set up ready for work within three or four hours. It is loaded on a fleet of thirty-three vehicles, twelve of which are heavy lorries, eight smaller ones, six water trucks, five saloon cars, and one lorry for *x*-ray outfit with dark-room and all equipment, and another for sterilizing apparatus. One hundred patients can be looked after at one time—fifty in beds and fifty on stretchers. The personnel consists of Mrs. Spears (wife of Brigadier-General E. L. Spears, and known to a wide circle of readers as Mary Borden) and her second-in-command, eight fully qualified hospital nurses, eight V.A.D. drivers, and fifteen French orderlies. Fifteen members of the Friends Ambulance Unit, who will drive the heavy lorries, are also attached, as well as seventeen members of the American Field Service. All these men are trained in first aid, and most of them are also fully qualified mechanics. The medical staff is French, and will probably be supplemented from the French forces in the field. It includes a surgeon and a radiologist. A laboratory worker and a chemist have also been recruited.

When unloaded the hospital will consist of five tent wards, each holding twenty beds (or stretchers), with a separate tent for infectious cases, an operation tent large enough to take two operating tables, and tents for staff and for storage. Two generating plants are carried, one for the operation tent and the other for the *x*-ray unit. There is also a well-stocked pharmacy and a laboratory with microscope and sufficient equipment for ordinary work. The equipment further comprises an oil-burning field kitchen, easy and simple to manage, a disinfestor for clothing, and the usual appurtenances of a hospital—ward screens, crutches, splints, ether inhalers, complete mastoid, dental, and ophthalmological sets, an outfit for cranial surgery, as well as the usual surgical instruments, with bandages and dressings. Supplies, including car spares, are available for six months; in other words, should the hospital be cut off from communications for six months it would be able to function completely. The only commodity it does not carry is food, which will be supplied by the French Army.

The organizers have kept the hospital on French lines as much as possible. The staff will have their own uniform and badge, and when in uniform will also wear the badge of the Free French Forces.

AWARDS FOR GALLANTRY IN CIVIL DEFENCE

The award of the George Medal to Dr W S W[illegible] medical officer of health and school medical [illegible] West Bromwich, and to Miss E. G. Thomas, [illegible] West Bromwich and District General Hospital, [illegible] in a *Supplement* to the *London Gazette* dated [illegible]

Dr. WILLIAM STANLEY WALTON and Miss EVELYN [illegible] THOMAS: "Enemy bombing started large fires [illegible] near the West Bromwich and District General Hospital. Dr Walton, who was in the control room, left to [illegible] survey of the work of the casualty services. He [illegible] tinguishing incendiary bombs and then saw the [illegible] which appeared to him to be proceeding [illegible] Hospital. He went there immediately and [illegible] hospital laundry, immediately opposite to the [illegible] was in flames, together with other buildings [illegible] to the hospital, and while he was discussing with Miss [illegible] the matron, the advisability of evacuating [illegible] bomb fell which demolished the hospital laundry. [illegible] the matron were blown in different directions. He [illegible] decided that the hospital should be evacuated. Dr W[illegible] and Miss Thomas undoubtedly provided the leader[illegible] initiative which was a very great factor in the [illegible] carrying out of this difficult and dangerous task. [illegible] made many journeys to the first-aid post and to the [illegible] department to put in train the arrangements for the [illegible] of ambulances, and showed a complete disregard [illegible] personal safety. Miss Thomas herself very coolly [illegible] the nursing arrangements and the removal of the [illegible] ready for evacuation, and set a splendid example [illegible] nursing staff. During all this time the hospital was [illegible] to constant attack."

Local News

ENGLAND AND WALES

Tuberculosis in Wales

Dr. Powell, principal medical officer to the Welsh National Memorial Association, discussing in his latest report the effects of the war on the care and control of tuberculosis in Wales states that many of the patients who were sent home at the beginning of hostilities were most reluctant to return when admissions were resumed. Facilities for the surgical treatment of pulmonary tuberculosis have been drastically reduced. "It was estimated some little time ago," he continues, "that it would take nine months at the then rate of operating to cope with the cases already in residence at Sully, and in the meantime new cases suitable for surgical treatment are presenting themselves in increasing numbers." The number of contacts examined, always fewer "per 100 deaths from tuberculosis" than in the country as a whole, owing largely to conditions peculiar to Wales, have been even fewer in the past year. That this is due "partly to the pressure of other work" can readily be believed, but it is a pity that Dr Powell should provide those responsible for circumstances which render adequate contact examination impracticable with the justification that the decline is also due "partly to the difference of opinion which exists at present in tuberculosis circles as to the real value of indiscriminate contact examinations." That institutional treatment of pulmonary tuberculosis is unsatisfactory is shown by the fact that of 1,750 sputum-positive patients (45% of whom stayed over six months) not more than 3% were discharged as quiescent (patients who stayed less than one month were not included in these figures).

Lord Sankey on Hospital Co-ordination

At the annual meeting at Oxford of the Berks, Bucks, and Oxon Regional Hospitals Council, Lord Sankey, who expressed his good wishes for the regionalization of hospital services, one of the objects of the Nuffield Provincial Hospitals Trust, recalled his chairmanship of the Commission set up by the British Hospitals Association, which reported in 1937. The Commission, he said, at once saw the necessity for co-ordination not only between the voluntary hospitals themselves but between the State and municipal system of hospitals and the voluntary system. A whole chapter of its report was devoted to the relations between voluntary and council hospitals. It had recommended that regional hospital councils should consider the desirability of including representation of local authorities and that the Ministry of Health should be entitled to appoint representatives. There was always a question between the State and the voluntary system in this respect that the voluntary system had more freedom and elasticity. It was able to make more experiments and to do things which a State service was prevented from doing by those rigid rules quite rightly imposed by Government departments. For years these two great services had been running on parallel lines, and the scheme which the Nuffield Trust was now engaged in furthering was to unite them, a process which called for mutual tolerance, understanding, and forbearance. He hoped that in the region whose council he was addressing they would be able to "stable their horses together" and all would work successfully for the end they desired to see accomplished. He concluded with a tribute to Lord Nuffield, who, not content with serving his own age, "has extended the dominion of his bounty to heal the sick and relieve the sufferings of generations yet to come."

INDIA

Tuberculosis Work in India

The second All-India Tuberculosis Conference was held in New Delhi at the end of 1939, and the *Transactions*, a volume of more than 200 pages, has now been received. The conference took place under the auspices of the Tuberculosis Association of India, whose medical commissioner, Dr. C. Frimodt-Moeller, was chairman of the various sessions. Several of the sessions were attended by the Vicereine, the Marchioness of Linlithgow, who gave a description of the Papworth Settlement, with which her father, the late Sir Frederick Milner, was prominently associated. She begged those concerned in India to keep the colony idea in view, and to start colonies in a small way wherever possible. Several speakers in the discussions said that village settlements on the Papworth model would be the ideal after-care system for India, and the Tuberculosis Association was urged to see if they could not be established in a few selected centres. Dr. Frimodt-Moeller said that by force of circumstances the chief measure in the Indian campaign was a well-thought-out scheme of control of tuberculosis by organized home treatment. He agreed that this scheme was not the ideal one, for in the West it was known that the death rate from tuberculosis had declined most markedly in those countries in which there existed the greatest facilities for institutional treatment: but it was out of all question to create in India institutional treatment to the extent that this had been done in Western countries. A system of home treatment must be organized whereby thousands of patients would be able to get in their homes some benefit from the modern specialized treatment of the disease, and some preventive measures would be introduced against further spread. The papers and discussions printed in these *Transactions* cover a wide range, including causative factors, physical examinations, diagnosis, collapse therapy (the subject of several papers and some interesting discussions), the virtue of institutional and home treatment, and the direction of propaganda and education. It was mentioned in one paper, by Dr. A. C. Ukil of the All-India Institute of Hygiene and Public Health, Calcutta, that one million lives were lost in India annually owing to tuberculosis. He said that in view of this toll and of the shortage of beds for tuberculous patients the enforcement of the provisions of the Indian Health Acts for notification, disinfection, and segregation could hardly be expected at present, but a great deal might be done towards home segregation by tactful and sympathetic medical officers and health visitors. Evidently India is now very tuberculosis-conscious, but the fear was expressed that unless State aid is forthcoming the campaign in India would die a natural death when the wave of enthusiasm subsided.

Correspondence

Sulphathiazole Snuff for Diphtheria Carriers

SIR,—In the article by Drs. M. E. Delafield and Edith Straker and Prof. W. W. C. Topley on antiseptic snuff (February 1, p. 145) it was suggested that in view of its action on diphtheroids, sulphathiazole snuff might prove effective in the treatment of nasal carriers of the diphtheria bacillus.

A child developed diphtheria after being in hospital for two weeks. A search was made for a carrier. It was discovered that the nasal swabs from two nurses contained the diphtheria bacillus. In the case of Nurse A. a profuse growth was obtained. In the case of Nurse B. only a few bacilli were found and the swab was negative when repeated. Both nurses were given a sulphathiazole snuff. Following the suggestions in the article referred to above, the proportion of sulphathiazole was increased to 30 parts with 70 parts of magnesium carbonate, and the snuff given more frequently. Progress was as follows:

Nurse A.—Schick test negative. First day, snuff taken two-hourly. Some stinging in the nose and watering of the eyes in the evening. Second day, nasal swabs negative (taken 10 a.m.). Snuff taken six times (approximately three-hourly). No discomfort. Third day, nasal swabs taken before any snuff had been taken proved negative. Snuff taken four times. No discomfort. Fourth day, nasal swabs negative. Snuff taken four times. Fifth day, no further snuff taken. Seventh day, nasal swabs negative. Twelfth day, nasal swabs negative. Presumed free from infection.

Nurse B.—Snuff taken as above for three days. All nasal swabs negative. Seventh day, nasal swabs negative. Presumed free from infection.

Nurse B. can hardly be considered to have been a carrier. The rapid way in which Nurse A. was freed from infection suggests that the method is worthy of a thorough trial.

We are indebted to Miss Lucy Wills for her help and suggestions.—We are, etc.,

A. M. M. PAYNE,
Senior Resident Medical Officer.
GLADYS M. AUCHINLECK,
Resident Pathologist.

Royal Free Hospital,
London, W.C.1, Feb. 18.

Chemoprophylaxis of Anaerobic Infections

SIR,—In Dr. Frank Hawking's valuable study of chemoprophylaxis in anaerobic infections (February 22, p. 263) there is one subsidiary point which deserves more attention than he himself gives it. Having described in detail the prophylactic action of sulphathiazole and other sulphonamide compounds, he briefly mentions similar experiments with proflavine. Apparently the application of 1% or even 0.1% proflavine will "certainly prevent" infection under the conditions of these experiments, a fact noteworthy enough in itself. But further than this, whereas after successful application of sulphathiazole films from the wound made on the third day "invariably demonstrated great numbers of Clostridia," wounds treated with proflavine and opened on the third day showed "only small numbers of bacilli."

I do not wish to place undue emphasis on his very brief description of what may have been an experiment in only a few animals, but as this record stands it suggests that proflavine is not merely the equal of sulphathiazole for preventing infection by Clostridia but actually superior to it. Yet he apparently discounts these results and regards them as unworthy of further attention, only for the reason that acridine compounds gave "mediocre results in the last war." This is a form of reasoning which I cannot follow: the results of controlled experimental study by a new method cannot be confounded by reference to uncontrolled clinical study made under very unfavourable conditions a quarter of a century ago. There would be some force in this argument were there any resemblance between the methods used, but there is not. Acridine compounds were used in the last war mainly for treating well-established wound infections, not for preventing them at a stage when prevention had any hope of success. I have argued recently (*Lancet*, 1940, **1**, 845) that the battlefield is no place on which to judge what antiseptics can do in preventing wound infections: casualties may not be brought in for some hours, and penetrating wounds are inaccessible by antiseptics applied in the ordinary way. I have suggested two hours after wounding as an arbitrary period delimiting prophylaxis—that is, the killing of bacteria in the cavity of the wound—from the treatment of infection thereafter entering the surrounding tissues. Dr. Hawking has adopted this period himself, and found that sulphathiazole introduced two hours after infection saved only one-fifth of his animals (two-thirds having survived when it was applied immediately); introduced after six hours it saved none. This treatment after six hours is surely more nearly the equivalent of what was done with acridine compounds in the last war.

Antiseptics have had few fair trials as agents for preventing wound infections. I have consistently maintained that acridine compounds are calculated by everything we know about them to be capable of this if properly applied at an early enough stage. Dr. Hawking's experiments appear to confirm this in the particular case which he has studied. That a 0.1% solution of proflavine can do as much as or more than solid sulphathiazole is more remarkable than he seems inclined to admit, although there is perhaps a reason for this result which detracts somewhat from its general significance. The dye antiseptics have a strong affinity for fabrics, and this may have led to the concentration and persistence of proflavine in the cloth which was the vehicle of infection in these experiments with an actually bactericidal effect. I think it very probable that sulphathiazole will prove superior to proflavine if only because its degree of solubility secures persistence in adequate concentration in the wound for four days, as Dr. Hawking has shown. This letter is written only as a plea for justice to an older method, and for impartiality in interpreting experimental findings.—I am, etc.,

Harpenden, Feb. 23. LAWRENCE P. GARROD.

Trichiniasis in Britain

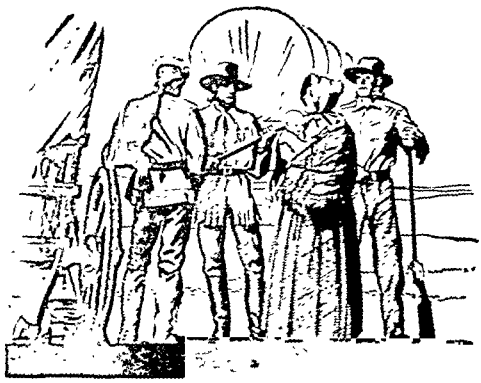
SIR,—The accounts by Dr. J. E. Stanley Lee (February 15, p. 237) and by Prof. L. P. Garrod and Dr. Donald Maclean (p. 240) of outbreaks of trichiniasis are of considerable interest.

A similar outbreak occurred in Pembrokeshire in November, 1939. Eight cases were investigated and all had oedema of the eyelids associated with supra-orbital pain, especially on movements of the eyes. Each had a high eosinophil count, ranging from 23 to 55%, together with pyrexia and muscle pains. One case developed a profuse but transient haematuria, which was assumed to be due to larval embolism of a kidney. In none of the cases was there any history of gastro-intestinal trouble. A peculiar feature of the muscular pain was described by some of the patients, who experienced pain after movement of the affected muscle but not synchronously with the movement.

The diagnosis of trichiniasis in these cases was suggested by their resemblance to a similar series of eleven cases, an account of which was published by Rice, Williams, and Sladden (*Lancet*, 1922, **2**, 799). This series, which also occurred in Pembrokeshire, was characterized in every case by oedema of the eyelids and a high eosinophil count, and Dr. A. F. Sladden demonstrated a few adult female forms of *Trichinella spiralis* after patient search of films of faeces pressed between photographic plates. This procedure was carried out on stools from my cases, but without success. A piece of muscle was excised and examined by Dr. A. W. Downie of the E.M.S. laboratory, Cardiff, but although a tender area of the deltoid was chosen for the purpose no larvae were found.

In your leading article (p. 245) you mention the significance of the fact that outbreaks should occur simultaneously at Wolverhampton and in Hertfordshire. It is perhaps equally significant that there should have been two outbreaks in Pembrokeshire fairly recently and that similar cases have been suspected in the same district in the intervening period.—I am, etc.,

Haverfordwest, Pembs, Feb. 20. J. F. E. GILLAM, M.B., F.R.C.S.





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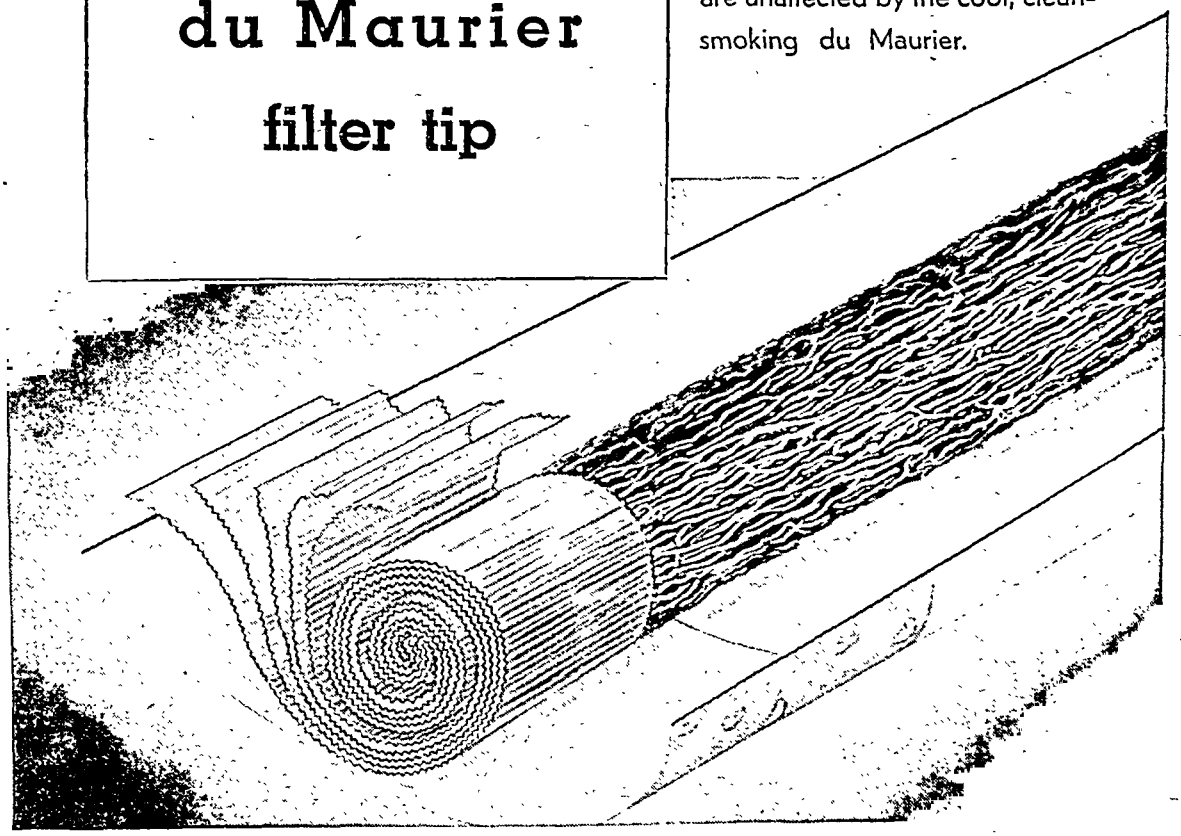
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Dyspepsia in the Army

SIR,—If it were true, as alleged by Mr. Reginald T. Payne and Dr. C. Newman in their interim report on dyspepsia in the Army (December 14, p. 819), that 89 % of all dyspeptics in the Army suffer from "gross organic disease," chiefly peptic ulceration, then a rather alarming state of affairs exists. And if it were also true that "there was little evidence of minor dyspepsia" and that "exaggeration of symptoms for evasive purposes" was rare, then it would seem that the modern soldier's stomach and philosophy had undergone a radical change.

In one military hospital in the Home Command, over a period of twelve months, over 200 cases of chronic dyspepsia have been thoroughly investigated in a ward set aside for that purpose. In only sixty-four was there evidence of peptic ulceration: duodenal fifty-four and gastric ten. Chronic gastritis, achlorhydric and hypochlorhydric, gall-bladder and appendicular dyspepsias comprised only a handful. In the remainder no evidence of organic disease could be found. The latter had often been studied elsewhere and formed a floating population that drifted from one hospital to another. Relapse monotonously followed each course of treatment, while the patient's knowledge of dyspepsia, barium meals, and the ways of ward sisters and medical officers grew accordingly.

I quote only from my own experience, but it cannot differ greatly from that of other medical specialists. The statistical survey presented to the Army by Mr. Payne and Dr. Newman may not be truly representative, since their material was largely selected for them. A truer picture would be forthcoming if the collected experience of medical specialists in the different Commands was studied.—I am, etc.,

JOHN D. SPILLANE
Major, R.A.M.C., Medical Specialist

Co-ordination of Mental Health Services

SIR,—The National Council for Mental Hygiene was interested in your leading article on "Hospital Administration in the L.C.C." (January 11, p. 56) and in the letter arising out of it from Dr. Francis Pilkington (February 8, p. 213).

This Council has always advocated the policy of co-ordination of the mental health services, especially co-ordination between the municipal general hospital, the mental hospital, the mental deficiency colony, the voluntary general hospitals, and the voluntary mental health organizations in each area. Much of the overlapping and many of the gaps which now exist in these services are primarily due to the fact that these bodies are working in watertight compartments. The report of the Feversham Committee which was published in July, 1939, recommended among other matters the establishment of mental health committees which would include all mental health interests in each administrative area, with co-operation between adjacent areas.

The war has already brought various mental health problems into prominence, and the problems connected with evacuation have shown the difficulties which have arisen owing to lack of co-ordination between different areas. It is to be hoped that the Medical Planning Commission of the British Medical Association will be augmented by representatives of mental health interests, and that special attention will be paid to this important question of co-ordination of the mental health services.—I am, etc.,

DORIS M. ODLUM,
Honorary Secretary

London, Feb. 18

Treatment of Cancer of Cervix

SIR,—The interesting analysis of cases of carcinoma of the cervix treated at the Middlesex Hospital and published by Mr. W. R. Winterton and Dr. B. W. Windeyer (February 8, p. 195) illustrates the danger of accepting conclusions drawn from statistical evidence unless this evidence is carefully analysed. From the data collected the authors conclude that "in technically operable cases a higher percentage of five-year survivals has been produced by radiotherapy than by surgery." This conclusion is open to severe criticism, for the deaths from causes other than recurrence from cancer have been included so as to weigh the balance in favour of radiation therapy. From the figures submitted we find that 64 patients of Groups 1, 2, and 3 (League of Nations classification) were treated by radical surgery. Of these 11 died as a result of operation and 24 died of cancer within five years, giving a total mortality of 35, or 55 %; 2 were untraced, and assuming these both died of cancer the mortality becomes 58%.

As opposed to this, 68 patients of Groups 1, 2, and 3 were treated by radiation, and of these 3 died during treatment and 39 died of cancer within five years, giving a mortality of 42, or 62 %. It follows, therefore, that in the series studied by Winterton and Windeyer the patient had a greater chance of living from the disease if treated by radiation than if treated by surgery. In discussing whether surgery or radiation is the better method of treatment there is little room for satisfaction for the advocates of either, for if the facts are faced the results given by both methods are at present unsatisfactory. The challenge is surely to find a better way of treating the disease, be it by surgery, radiation, or by a combination of both.

In conclusion, to avoid any misunderstanding I must say that at present I am treating my cases of cervical carcinoma by radium and deep *x*-ray therapy, but like so many other workers I am not satisfied with the prognosis, nor can I be satisfied with the conclusions drawn in favour of radiation therapy from the analysis of the Middlesex records.—I am, etc.,

JOHN STALLWORTHY.

Oxford, Feb. 18.

Medicine in a Changing World

SIR,—I have read with interest both the summary of Sir John Orr's excellent address (January 18, p. 73) and also the ensuing correspondence. Your editorial phrase (p. 91), "the cobbler must stick to his last," has already come in for criticism. It seems to me that there is both a sense in which it is right and a very important sense in which it is wrong. That medicine can contribute most to politics by standing aside and giving testimony as the expert witness I am convinced. On the other hand, it seems to me dangerous to assume that our contribution has the definition of the cobbler's. There are many ways in which the traditional approach of the doctor to his patient is changing. The fact that we may try to tell our patients what food to get is itself a change. A further change appears when doctors figure as the paid servants of the factory. In cases of doubt the doctor has then to settle with his conscience whether he will advise for the benefit of his patient or for the economy of working hours. In a situation such as this the custom of the profession undergoes a shift because of the circumstances which surround it. What the doctor happily has stuck to has been, not his last, but his Hippocratic tradition. On the whole, he does justice by his patient no matter who employs him. There is, however, a sense in which to attempt in the modern world to cling to the Hippocratic condition is to put one's head in the clouds, for the personal value and relationships out of the understanding of which that tradition was born have broken down. One of the virtues of the modern work on nutrition is that it gives an impersonal measurement of personal requirements.

It is possible that the present hostilities represent the attempt of the English tradition to salvage personal values and relationships. In so far as we are as successful in the ensuing peace as we appear likely to be in the present war, we shall need to build a world in which there will be increasing scope for simple human things. Nutrition, as Sir John Orr stresses, concerns only a phase of individual living. It is, however, an important phase, backed by scientific sanctions. To get our society to act on what it knows about nutrition would be a great step forward.

Medical officers of health have great powers in matters of nutrition. These officers are, I believe, responsible for the education of the local inhabitants in matters of diet. I once tried to get a medical officer to introduce the Oslo breakfast into the local schools, a scheme which had some local support. I was informed that "the value of protective foods is sufficiently recognized." Such an attitude may be "sticking to the last," but it is not promoting the best interests of the patients. But then, of course, they are not—to the medical officer of health—patients, only workers.

The questions of the personal relationships, of personal health and development, and of a social order which will recognize and facilitate these, are, I think, very much the

concern of the general practitioner. He understands that to go on practising family medicine two things are necessary. His own contacts with his patients must be kept unified. And his patients must live in a world where health and development are possible. I feel with many others that, in reconstructing medicine, if more general practitioners served on the Medical Planning Commission, particularly more rural practitioners, these two essentials would more certainly be safeguarded.—I am, etc.,

Coventry, Feb. 18. KENNETH E. BARLOW.

Medical Planning Commission

SIR,—Your correspondence columns are full of criticism of the personnel of the Medical Planning Commission on two main questions: representation of general practice and the preponderance of older men. From memory the following are members of that Commission: Drs. Dain and Gregg, who between them cover insurance practice for over twenty-five years and know more about it than any other doctors in the British Isles; Drs. Bone, Pooler, and Wand have all been working on general practice problems for the same time. No one who knows these men can have any doubt as to the forcefulness of their advocacy.

With regard to the second problem, your critics may well be reminded of R. L. Stevenson's dictum: "Where youth agrees with age, not where they differ, wisdom lies."—I am, etc.,

Braunton, N. Devon, Feb. 18. HERBERT C. JONAS.

SIR,—The criticism of the Medical Planning Commission which has already been published shows that its origin, constitution, reference, and the expected results of its deliberations have caused widespread misgiving. The chief reasons for this appear to be that the Commission was conceived and appointed in secrecy by a private body which is by no means representative of the whole profession. Its personnel gives the younger members of the profession no confidence that it will be able or willing to cut away from old traditional ideas and meet the changed world, which will follow the war, with a scheme of health service in keeping with the new conditions.

Any programme for the future must be worked by the men and women who are now young, and yet only three members have been qualified since 1925. "Matured wisdom" in any assembly is essential, but in the one in question it has a strong preponderance, and unfortunately seniority sometimes stands for rooted prejudice instead of matured wisdom. It is inevitable that the older generation should think of the future in terms of the past which has served it pretty well. The younger generation on the whole have little sympathy with the past, for to them it is the parentage of the present. But not only have younger people not been invited to join the Commission in sufficient strength; there is a gross under-representation of medical women. Only two women out of a total of seventy members have been chosen, and yet they form a proportion in the profession of about one to nine men, and they will play a still greater part in the health services of the country after the war.

Preventive medicine is represented by two medical officers of health and a professor of public health, some of the most important units of the whole personnel. The bulk of the members are concerned with the curative medicine, of end-results. Few such men can have spent thirty years or more of their lives in curative medicine and surgery and escape the conviction that the better health of the people depends upon better doctoring along the orthodox lines. It is not easy for them to see that the end-results, which engross nearly all our attention, would be considerably reduced in volume if the people were fed nutritiously, housed decently, and trained in the pursuits of leisure. And yet the Commission contains no social workers, members from the Ministries of Health, Food, and Agriculture (*pace* the "observers"!), trade unions, actuaries, economists, hospital managers, or laymen of the local authorities. We should have thought also that, as any future medical service should be primarily a health service, a member from the Pioneer Health Centre of Peckham should also have been elected. The vitally important branch of medicine—the care and treatment of the teeth—should surely have strong representation on a Commission for reconstruction. But perhaps the chief omission is the patient. A national Commission appointed to deliberate on a Service should be composed chiefly of the party for whom the Service is designed, advised by technical experts—in this case the doctors.

The terms of reference are vague and difficult to define. They are: "To study wartime developments and their effects on the country's medical services, both present and future." Presumably "wartime developments" refers to political, social, and economic changes which may emerge from the impact of the war on the people, but we cannot know yet what these will be. And it is not so much what may be their "effects on the country's medical services" which will matter, but how these services may be so reorganized as to meet the changed circumstances and demands of the people. The reference is vague enough to justify your leading article of January 4 (p. 19), anticipating the prediction of "the cynic" that seventy Commissioners may produce a low-grade compromise as the lowest common denominator of their views and prejudices.

The need for radical reconstruction of medicine, to give it a new orientation towards health as well as disease, is obvious to most of us, but surely, as Sir Ernest Graham-Little suggested, it should be the work of an independent Commission, to which the B.M.A. should, in common with other bodies, have been invited to send its representatives instead of assuming the role of convening authority.

But these and other criticisms imply that by modification on these lines the Commission could be moulded into a useful instrument. It may perform a service as a fact-finding body, but inasmuch as its emphasis is on "effects on the country's medical services" rather than expansion and reorganization of health services, I feel that the B.M.A. has approached the problem from the wrong angle. The health services form a vast network of influences on the individual and family of which medicine is only one part. The Medical Planning Commission may make certain recommendations touching the profession, but, in view of the probable demands of the public after the war, it is improbable that such sectional recommendations can be integrated into a new system of health service.—I am, etc.,

London, W.1, Feb. 12. ALECK BOURNE.

SIR,—If the Medical Planning Commission as at present constituted makes a report, and if a Royal Commission considers this report and makes another, and if Parliament then legislates according to its findings—all very hypothetical suppositions—by that time four-fifths of the original commission will be statistically dead, and, although it may serve them right, this form of protracted maternal death in childbirth is, I suggest, very unsatisfactory for the child.

A fair way of getting a representative commission is for each age group to send members according to its numerical strength; thus, if there are 4,000 30-year-olds on the *Register* they would send four members. The only exception that seems logical is to have the medical students also represented. It will, of course, be urged that as age increases so does experience and that this should be utilized, but the worst of experience is that it is so often counterbalanced by a static state of mind, lack of vision and altruism, and too often forgetfulness of first principles. In the last year or two quite a number of experienced soldiers and politicians, whom it would be tactless to name, are cases in point.

Man, it would appear, reaches his mental prime about 30, after which a more or less slow degeneration sets in, yet not a single member of the Commission is of or below this age. Personally I hope that just as the young men and women who are going to win the war for us should have the major say in the peace, so should the younger members of our profession have the planning of it, for they and they alone will live to see these plans in extended operation.—I am, etc.,

Beckley, Sussex, Feb. 13. C. G. LEAROYD.

SIR,—Critics of the Medical Planning Commission contend that more comprehensive representation on that body would ensure a satisfactory outcome for its deliberations. Permit me to say that the larger this already large Commission becomes the more it will be an arena for those various conflicting points of view whose only common sentiment is that things cannot go on as they are. Yet before the end of next winter war conditions are likely to demand swift, efficient co-ordination of the existing medical services rather than dignified deliberations over doubtful possibilities. Many fat chickens are being counted before they are hatched, and my

suggestion is that some planned action be now initiated by the Commission for the protection of the people In particular I suggest the commencement of planned research to counter the generally admitted danger of serious epidemics

Epidemic influenza, encephalitis, virulent measles, etc are virus diseases which have not yet been mastered even in the laboratory. Twenty-two years ago they killed more people than all the fatal casualties of the last war, and to-day, in company with virus diseases of animals and plants, they constitute the gravest possible threat to the lives of millions of men, women, and children. Against this threat stands a public health service and a body of general practitioners in need chiefly of new knowledge and new methods of treatment capable of stamping out virus infection in whatever form it occurs. At present the general practitioner knows very little about research and tries a large number of remedies in the most haphazard fashion. As for the research laboratories, these might have a century of peaceful security before them, judging by their published results. The biological, biochemical, physiological, and pathological journals regularly show long lists of research results on trivialities, curiosities, and rarities having little or no bearing on the urgent problems of the day. Out of experiment for experiment's sake there has grown a monstrous accumulation of uncoordinated and largely unused literature recently described by Sir Robert Hutchison as a "pullulating and fungus-like growth" (*Lancet*, 1939, 2, 59)

Is it not time that planned research was carried out by the various biological and medical laboratories under the guidance of men who know the outstanding scientific and medical problems, the most promising lines of research, and the investigators most likely to achieve successful results? If the Medical Planning Commission wishes to act as well as deliberate—and circumstances cry aloud for action—let it obtain the Ministry of Health's authority to join practitioners and laboratory workers together in planned, applied, and co-ordinated research, guided by a small group of well-informed and far-seeing men and women, in the interests of the people.—I am, etc.,

Oxford, Feb. 16. R. L. WORRALL.

SIR,—Lack of interest has kept me in ignorance hitherto of the composition of the Medical Planning Commission. Cursory glances at the correspondence columns of the *Journal* each week have, however, made it apparent that those who have elected to serve thereon may now have some diffidence in so doing.

The flower of the profession is away with the fighting Services, and as it is they who will be most affected by post-war reorganization of the profession it would be sheer presumption for those remaining at home to undertake any such planning, especially as it is certain that among them the pushing, the cranks, and the old gentlemen would be most active—the others would not have the time.

Formation of plans postulates knowledge of the material which will be available for building purposes. No such knowledge exists. We are not concerned with castles in Spain. That changes in the life of the community will be tremendous is assumed too readily; changes are only as certain as they are necessary, and post-war conditions will depend both on the duration of the war and on the possible turns in it which are as yet unknown to us. Let this farce of "planning" be stopped until the war is over, or there will certainly be the devil to pay if those returning from the war find themselves saddled with some half-baked scheme. There is more than enough real work to be done at home now—let those at home get down to it and stick to it.—I am, etc.,

Newcastle-upon-Tyne, Feb. 22. GEORGE A. MASON.

Trends in Nutrition

SIR,—I was greatly interested in the summary of Sir John Orr's B.M.A. Lecture (January 18, p. 73) and made a few notes of its content. I feel stirred to write a note in view of my experience on November 23. On that day, among other patients, there were these three who in reply to the question "Do you eat cabbage for dinner?" replied as follows: No. 1. Male aged 28 years: "I never eat cabbage: I eat plenty of white bread and potatoes." No. 2. Female aged 26 years: "I don't like cabbage, I never eat cabbage; I eat puddings or just potatoes." No. 3. Male aged 19 years: "I never eat cabbage." These three test cases are typical of scores that have come under my observation during the past ten years. Of 100 children suffering from non-pulmonary tuberculosis, sixty had an aversion to green vegetables; of thirty suffering from pulmonary tuberculosis, twenty-three had an aversion to green vegetables; of 100 young women between the ages of 15 and 20 years, fifty-three had an aversion to green vegetables. *Diet deficiency in these cases was not due either to* poverty or to shortage of supply but to dislike.

Now it appears that Sir John Orr believes dietary habits of the people can be changed by increasing the production of protective foods and by fixing an appropriate price within the means of the poor. An abundant supply of green vegetables at a price of 1d. or 2d. per lb. will maintain the consumption of green vegetables at a higher level than it would be if the price were 5d. or 6d. per lb. If the lower price can be maintained at this time of the year, then the people will certainly benefit. In this district housewives cook green vegetables three or four days a week, but when the price rises to 4d. or 6d. per lb. then only once a week on Sundays. But neither increased production nor cheapness will *alter the diet habits* of those who dislike green vegetables. This aversion to green vegetables is formed at an early age through parental ignorance—ignorance, not of food values, but of child management, of the art of persuading a child to eat something different.

An agricultural policy that aims at increased production, an economic policy that maintains a moderate price, an educational campaign on the nature of foods, are all essential, but will not be sufficient to overcome diet deficiencies. There will be necessary a widespread campaign educating parents and guardians in all classes of the community in the art of managing the faddy child.

If space permits, I should like to comment on the suggestion that the frustrations of life tend to be associated with poverty. Concerning tuberculosis, I agree that diet deficiency plays an important part—but that the actual manifestation of the disease is associated with some frustration; but I do not agree that all such frustrations tend to be associated with poverty, nor with the logical outcome of the argument that the frustrations of life would be removed by removal of poverty. In my experience the frustrations of life associated with the manifestation of tuberculosis fall into three or four categories: (1) bereavement; (2) disappointment in love affairs, broken families; (3) failures in examinations or business, or loss of work; and (4) other emotional shocks. Poverty may enhance these states but it is not a determining factor. Individuals who break down under the stress of life do so not because of poverty but because they have acquired a temperament difficult to adjust to failure and defeat. They are the maladjusted, the misfits of society; they are to be found in all classes of the community, in homes of wealth and of poverty. This type of temperament will not be eliminated by the elimination of poverty but only by wise home training.—I am, etc.,

P. A. GALPIN,
London, E.13, Feb. 4. Tuberculosis Officer.

Village Settlements for the Tuberculous

SIR,—With the death of Sir Pendrill Varrier-Jones has departed a pioneer in an aspect of the care of tuberculous individuals which was almost entirely neglected in the past, until he directed his efforts to this field, and which is still grossly neglected in the present. It occurs to me that he—like all true pioneers—would have derived his greatest satisfaction from that recognition of the importance and value of his work which a wider adoption of his methods would have afforded.

That a nation-wide need exists for workshops and factories where workers with arrested tuberculous lesions can be employed under special conditions and under medical care, no one working in anti-tuberculosis schemes can deny. Why, then, have such arrangements not become part and parcel of all anti-tuberculosis services, as, I contend, they should have this long time past? There can be little doubt that the answer to this question is to be found partly in the competitive nature of our society and partly in the tedious reluctance of public authorities and Government bodies to allocate finance for adopting new measures for the protection of the public health, even

when the efficacy of such measures has been clearly proven. How else is it to be explained that such institutions as Papworth Village Settlement, Preston Hall, and Peamount Village Settlement have not been copied all over the country? In a similar light stand such institutions as the Cripples Training College at Leatherhead, Surrey.

Much of the interest which these institutions have evoked appears to be derived from the fact that they are still regarded as "bold and courageous experiments," and that they are the exception rather than the rule, as well as from the excellent work which they have undoubtedly accomplished. Almost all of them are dependent or semi-dependent on charitable sources for their income, and in 1937 the Cripples Training College already referred to had to report that ". . . the financial position leaves much to be desired. Running costs exceeded receipts by £357, while of the original loan of £6,000, £2,000 has still to be repaid. . . . Contributions are therefore most urgently required, and until a more stable foundation can be established the work of the college must be seriously hampered." Further, though a high percentage of trainees from this college are placed in industry, work cannot be guaranteed in a society suffering from a chronic unemployment, which affects healthy, let alone crippled, workers. And again, the marketing of commodities produced by patients and workers in such special institutions raises innumerable difficulties. I know of at least one mental hospital where the excellent articles created through the craft activities of the patients are stored in a large room, only seeing the light of day for exhibition purposes, their sale being prohibited because of the objections of local tradesmen.

All this is in marked contrast to what could be achieved in this field of medical economics in a society released from the restrictive influence of the profit motive.

In the U.S.S.R. the principles and practices so strongly advocated by Sir Pendrill Varrier-Jones in the care of tuberculous workers are universally carried out through the network of "labour prophylactoria" attached to the institutes of tuberculosis. I was able in 1939 to visit the Leningrad Institute of Tuberculosis, and there saw for myself the excellent work being carried out in the training and re-education of tuberculous workers. Many of these workers eventually take their place in production in special factories and workshops, working entirely outside the various schemes of planned production and under constant medical supervision. In the U.S.S.R. such provision for tuberculous workers is universally applied, since it is regarded as an integral part of treatment. A further important point is that for such workers—whether disabled through disease or injury—work could, in a socialist economy, be guaranteed, and this is in fact what occurs in the U.S.S.R.

This brings me to my final point, which I will put in the form of a question. Are we to wait until our capitalist form of economy is replaced by one based on socialized production before the Ministry of Health (acting in conjunction with the various local authorities and, in the case of Wales, with the Welsh National Memorial Association) can be expected to adopt such measures on a nation-wide scale; or is the Government prepared *now*—as an earnest of its avowed intention to "build a new world after the war"—deliberately to foster and encourage the initiation of schemes of this kind for the training and employment of tuberculous persons? The answer to this question is, I maintain, one of tremendous importance, as it involves a question of policy.

To adopt the latter course would solve one of the most difficult and pressing problems which face tuberculous patients when they leave sanatoria, and would go far to break that vicious cycle of "tuberculosis—poverty—tuberculosis" which is so often established when the person affected is a family wage-earner. It would at the same time be the highest tribute to the memory and work of Sir Pendrill Varrier-Jones.—I am, etc.,

Neath, Glamorgan, Feb. 17. T. FRANCIS JARMAN.

The Evacuation Problem

SIR,—May I through your columns draw the attention of all medical officers of health and all medical men in the public services to the importance of protecting the world and the coming generation by securing the evacuation of children in a sensible way. At present the L.C.C. is spending public moneys extremely wastefully. This can be tested by any health visitor inquiring from the women of the poorer districts of London the truth about evacuation. They will find that a considerable percentage of children have never been evacuated at all, because mothers say that they cannot let their children go away from them. Another high percentage have been evacuated once, and they have come back again. A fair number have been evacuated twice, and a percentage have been evacuated three times over. They will also find a fair number of mothers who are intending to have their children evacuated again as soon as the weather gets better. The idea growing up in their minds is that they can use the evacuation scheme as a means of getting a holiday in the country for themselves and for their children. The L.C.C. pays fares down there and allows a billeting allowance while they are away, and this means that they can get a cheap holiday at a charge which is of no benefit to the country, for the welfare of England needs the *permanent* removal of children from the great towns.

This matter is becoming serious and urgent. Those who are working among the slum children of London are finding that the disease of rickets is beginning to increase; that pale faces, tense nerves, weakened bodies are becoming more and more prevalent among the children who are spending most of their time in shelters and underground habitations. The children are suffering from lack of light, lack of air, lack of fresh vegetables, and lack of the ability to spend a halfpenny or a penny upon oranges and bananas and apples whenever they feel hungry. In addition, there is a shelter rash beginning to show itself which is not scabies, but which is probably the result of these unhealthy conditions under which children are living. Not only are the children deteriorating physically, but, having nothing to do and no school training, they are becoming mentally listless and degenerating in all respects.

The matter is extremely serious, and it is only the medical profession, by wise and powerful influence, which can make our politicians face what is essential for the welfare of the coming generation. It is in the country alone that the children can now be provided with a sufficiency of those greens and salads and fresh vegetables which, essential as they are to the children's health, are now lacking in their dietary.—I am, etc.,

London, W.1, Feb. 23. JOSIAH OLDFIELD.

Bell's Palsy and Herpes Zoster

SIR,—A few weeks ago I was called to see a man aged about 65 who was suffering from a very painful erythema of the left side of his face, while here and there were a few very tender red lumps closely resembling boils. The nature of the erythema was not very clear to me until the following day, when typical herpetic vesicles were visible on the cheek, in the hair over the left occipital region, and down the back of the neck for a distance of about three inches below the lower margin of the hair. He had had an extremely painful night. As the nature of the lesion was now obvious pituitrin was given, and the following morning I was told that the relief had been wonderful. Four daily injections were given, and the vesicles and pain diminished with equal rapidity.

About a fortnight later I received an urgent summons from his wife, as "something terrible has happened to my husband." Expecting at least a corpse by the time I arrived, there was nothing worse to be seen than a typical Bell's palsy on the same side as the herpes. After about three weeks there was a marked improvement as regards the Bell's palsy.

It seemed natural to assume that the herpetic virus was the cause of both conditions, though I do not recollect ever having seen or read of this occurrence. Your contributor Major J. D. Spillane (February 15, p. 236), however, appears to confirm my suspicions. In this case there were no vesicles in the ear; they appeared to be confined to the second and third branches of the trigeminal and (?) the cervico-facial.—I am, etc.,

Hove, Feb. 18. G. LLEWELLYN DAVIES.

SIR,—The following brief case report may be of interest, as the clinical combination of herpes zoster and facial palsy described in Case V of Major J. D. Spillane's series was present.

A man aged 73 gave a history of general malaise, anorexia, and abdominal pains for three days, and when first seen had

a typical herpes zoster affecting the Th. 9 segment on the right side. The rash was noticeably profuse, and for several days systemic upset was marked. Pituitrin was given but did not appear to influence the normal course of the disease. Three weeks from the onset of the illness, while there was still considerable reddening and scarring in the rash area, the patient suddenly developed a typical Bell's palsy on the left side. The discomfort of the facial immobility was the only complaint. There was no otitic pain. The skin of the auricle and external auditory meatus appeared to be healthy, and no vesicles were seen on the tympanic membrane; likewise the soft palate and fauces were normal. In view of the history a diagnosis of geniculate herpes seemed probable, facial paralysis being the only clinical manifestation. The patient suffered subsequently from a troublesome post-herpetic neuralgia, but the facial paralysis cleared up uneventfully and without treatment in six weeks.

It is suggested, though the possibility of coincidence cannot be overlooked, that there was in this case an invasion of the geniculate ganglion secondary to a herpetic infection of the ninth thoracic posterior root ganglion. The apparent absence of any involvement of the sensory area of the facial nerve is noteworthy, and bears a close resemblance to Major Spillane's case of combined geniculate and trigeminal zoster. The case appeared to offer clinical evidence supporting the view that some of the usual uncomplicated cases of Bell's palsy are due to herpetic infection of the geniculate ganglion.—I am, etc.,

Sheffield, Feb. 18. F. W. LAURIE

Recurrent Attacks of Herpes

SIR,—Referring to the letter by Surgeon Lieutenant J. F. Burdon (January 25, p. 135) on recurrent attacks of herpes, I would like to draw his attention to an article in the *Zeitschrift für klinische Medizin*, vol. 106, 1927, on the "blister disease" (pusulosis). It is shown in this article that

(*a*) Herpes is an infectious disease *sui generis*.

(*b*) The following varieties—varicella, herpes zoster, herpes corneae, herpes sexualis-genitalis, herpes gestationis, herpes dermatitis herpetiformis, impetigo herpetiformis, papilloma neurotico zosteriforme, hyperidrosis manus, herpes febrilis simplex—are all caused by a neurotropic virus and all belong to the same family of infections. The common denominator of this kaleidoscopic array of phenomena is the blister (pusula).

(*c*) The diseases occur periodically, typically, and in predilected places.

(*d*) The fluid in the blisters is infectious to animals, and when brought into contact with the eye it causes encephalitis.

(*e*) Clinically, these diseases go through the phases of an incubation period, prodromal symptoms, eruptions, healing, and convalescence, as well as periods of contagiousness and immunity.

For treatment auto-inoculation is advisable. In herpes simplex the results are most favourable, in the other forms not so good; but in almost every case the auto-inoculation brings about a change in intensity, frequency, and character of the disease. It is best to inoculate on the second day of the eruption. The clear content of the blister should be rubbed into a scratch or abrasion made beforehand on the forearm. After two days the point of inoculation may become slightly red; between the third and the fifth days it usually shows small blisters. On the fifth day the formerly clear content of these blisters becomes opaque, and on the seventh day the blisters are dried up. On the day following the inoculation the patient feels upset, irritable, and feverish. Neuralgia, muscle-, joint-, and back-aches are normal disturbances. Generally all organs which have once been affected by the disease react with pain or swelling. The previously affected joints may become inflamed for one or two days. After the inoculation headaches with simultaneous affection of the cerebral nerves are common. Symptoms of cerebral disturbances, such as dizziness, sickness, and vomiting, may also occur. Sore throat and laryngitis can be observed in almost every case. If pseudo-angina is present an anginal attack may take place. Sometimes we have pollakiuria, and albumin in the urine but without urinary casts. During the fever period uraturia and phosphaturia may be found. With the disappearance of the fever, usually on the second day, the reactions abate, and on the fifth day everything is normal again.

As is seen, the inoculation causes a fairly serious illness, but the general feeling may be controlled by aspirin-like salicylates. Recovery is rapid and thorough. The results after inoculation are sometimes striking, modifying as it does the condition of the patient and changing the type of the disease. If no blisters can be found one may try an auto-transfusion with 1 to 5 c.cm. of blood at intervals of 5 to 10 days.—I am, etc.,

London, W., Jan. 28. J. PLESCH.

Plasma Infusion in Acute Haemorrhage

SIR,—In their valuable paper (February 8, p. 188) Drs. Black and Ford Smith state that "there is therefore no evidence that plasma infusion in these patients effected any mobilization of red cells from the tissues as it has been claimed to do (Brennan, 1940)." In advocating plasma transfusions in the treatment of haemorrhage (*Journal*, June 29, p. 1047) I reported a series of cases of acute haemorrhage in which rapid infusion of plasma an hour or two later caused mobilization of red cells. While I am aware that some workers do not accept these findings, I submit that if Drs. Black and Ford Smith were unable to find any evidence of such mobilization after the slow infusion of plasma thirty-six hours to six days after haemorrhage, this would not constitute a valid criticism of my observations. In fact, however, of the two cases treated by plasma of which they give the relevant particulars before and shortly after the infusions one—Case 7—shows on their own figures definite mobilization of red cells. Calculated on the venous cell counts it amounts to an increase of no less than 18% in the number of circulating red cells.

Few observers will disagree with the authors' conclusions as to the superiority of blood over plasma in cases of really severe haemorrhage, especially if the latter is of some standing. Indeed, it is difficult to see how serum or plasma could be expected to benefit a patient whose haemoglobin and haematocrit values six weeks after haemorrhage were only 18% and 8% respectively.—I am, etc.,

Leeds, Feb 18. H. J. BRENNAN.

Syphilis and Blood Transfusion

SIR,—Hundreds of thousands of adults in the British Isles are now volunteering as blood donors and all are having a routine blood test to exclude the possibility of syphilis. This seems to be an opportunity for throwing fresh light on what has been an interesting question for many years—the incidence of syphilis in the general population and more particularly the incidence of latent syphilis.

The true incidence will probably never be known unless every person has repeated tests by a serum reaction which is 100% infallible. Various attempts have been made to estimate the incidence. Some authorities have expressed the opinion that it is probably not unduly pessimistic to believe that in the male population of Great Britain more than 5% and perhaps as many as 10% will acquire syphilis before they die. The present rate of fresh infections which receive treatment is about 1.2 per 10,000 per annum. Indirect evidence of incidence has been obtained by investigating the ultimate destination and use of arsenobenzol compounds and from the figures of blood tests carried out as a routine at various antenatal clinics.

It seems improbable that anyone who suspects or knows he has syphilis will volunteer as a blood donor, and cases discovered will be for the most part latent. I should be interested to know if any attempt is being made to co-ordinate all the various results from transfusion centres or approved laboratories. Figures are quoted each year in an appendix to the Annual Report of the Chief Medical Officer of Health of the number of serum tests carried out in approved laboratories for treatment centres, hospitals, and general practitioners, but the percentage positive is not given, and obviously many of the tests must be repeat tests on the same patients. It would be interesting and probably useful if figures from transfusion services could be kept separate.

A further point of interest arises concerning the methods of dealing with those donors who are discovered to have a positive blood test. Is there a uniform policy for dealing with

them? Is he being quietly told that his blood is unsuitable and the matter left at that, or is he being further investigated with all that this may imply—the possible discovery of congenital and marital cases, the possible prevention of miscarriages and production of further congenitals? Admittedly much tact and discretion will be needed in dealing with these cases, but efforts to follow them up would surely be worth while.

Presumably the transmission of syphilis by transfusion will occur but rarely if most of the blood is being converted into plasma. It is conceivable, however, that there are centres where a register is kept and donors are called upon to give whole blood urgently—possibly weeks after their blood tests have been done. These donors may have contracted syphilis in the meantime and know nothing of it or be in the incubation stage. Dr. J. A. W. McCluskie (*Journal*, February 11, 1939, p. 264) drew attention to the possible danger of transmission of syphilis by transfusion in the incubation period and the possible medico-legal consequences. He also suggested a possible safeguard—the addition of 0.45 gramme of neosalvarsan to the transfused blood.—I am, etc.,

Rotherham, Feb. 6. R. C. WOFINDEN, M.D., D.P.H.

Bipp in Acute Osteomyelitis

SIR,—Probably the most important contribution to the efficient treatment of infected wounds during the last war was the introduction of the bipp method by Prof. Rutherford Morison. During the past twenty years this method seemed to lose favour with many of the post-war generation, who, perhaps, like the Athenians of old, were searching for some new thing. Fortunately Morison's bipp treatment has been powerfully advocated and his technique clearly explained in recent issues of the *Journal* by Dr. William Mackenzie (December 28, p. 917), Prof. R. J. Willan (January 11, p. 62), and Sir Charles Gordon-Watson (February 8, p. 211). May I give my testimony as to its great value in the treatment of acute osteomyelitis.

In June, 1921, a boy of 6 years was admitted to the East Suffolk Hospital under my care. He was very ill; temperature 105° F., pulse 160. The left leg was greatly swollen, inflamed, and acutely tender; there was no involvement of knee- or ankle-joint. A tourniquet was applied above the knee. This is of primary importance to avoid blood infection during the operation. A free incision was made on the inner side of the tibia for the whole extent of the diaphysis. The periosteum was completely stripped from the whole of the diaphysis by a quantity of pus, from which a culture was taken.

I thought it possible that even when the outside of the shaft was bathed in infected pus and the medullary canal similarly infected, the actual dense bony tissue might retain its vitality if completely disinfected on its outer and inner surfaces, and if the surface of the periosteum were also completely disinfected. The pus between the shaft and periosteum was first washed away, and then the surfaces of the bone and periosteum were thoroughly scrubbed with gauze swabs soaked in carbolic lotion 1 in 20, and then with methylated spirit, and finally with ether; layers of sterile gauze were packed between the periosteum and the shaft. Next the medullary canal was laid open for the whole of its length, the marrow, which was infiltrated with pus, was scraped away, and the interior of the canal thoroughly scrubbed with carbolic lotion, alcohol, and ether. Finally strips of gauze saturated with bipp, from which the excess was squeezed out, were placed between the periosteum and bone, and the medullary canal was packed with similar strips. A sterile dressing was then applied and firmly bandaged, and the tourniquet removed.

Next day, when the dressing, which was soaked with blood and serum, was removed, all swelling, redness, and tenderness had disappeared, the leg was of the same size as the other, the temperature and pulse were normal. The strips of gauze were removed on the third day. The wound healed without suppuration except for a small sinus on the metaphysis, which continued to discharge a little pus for several weeks until a very small sequestrum came away and the sinus closed. During this time there was a slight febrile reaction. *Staphylococcus aureus* in pure culture had been grown from the pus, and a vaccine was given. The diaphysis maintained its vitality; there was no sequestration or growth of new bone. A photograph of the two legs taken five years later showed complete similarity, except for the scar of the operation, and a radiograph of the left leg showed an absolutely normal tibia, except for the absence of a medullary canal (*Clinical Journal*, February 19, 1930).

I was not aware at the time of the operation that the original focus, from which infection spreads between the periosteum to the shaft and then to the medullary canal, is to be found in the cancellous tissue of the metaphysis. If that had been opened and treated with bipp the whole limb might have healed within about three weeks.—I am, etc.,

Worthing, Feb. 15. HERBERT H. BROWN.

Anuria after Sulphapyridine

SIR,—The case of fatal anuria following sulphapyridine in pneumonia reported by Major F. R. Fletcher (February 15, p. 242) is very interesting. I am, however, chiefly concerned in the treatment.

Decapsulation of the kidney is only a half-hearted procedure, and pyelostomy is useless unless the ureters are obstructed. The only curative operation is nephropyelostomy. The kidney should be incised along the convex border, and a tube inserted down to the pelvis. The kidney should then be lightly sutured, just enough to arrest haemorrhage. In the case reported pyelostomy was performed only on one side. I would like to know why.—I am, etc.,

London, W.1. F. MACG. LOUGHNANE.

Sterilization of Instruments

SIR,—There are one or two points suggested by Dr. W. N. Leak's letter (February 15, p. 254) on the sterilization of instruments which may interest the many who nowadays are helping in the diphtheria immunization campaign. When the empty and sterile needle is put "on the vacant nozzle of the operator's syringe" it will be necessary, before making an injection, to fill the needle with the inoculum by gentle pressure on the piston until fluid begins to emerge from the point. If this is not done, (1) air, possibly contaminated with organisms, will be injected ahead of the inoculum, and (2) the patient will not receive the full dose.

There are times when one has to carry out injections without an assistant and in unhygienic surroundings. May I recommend once more (*Publ. Hlth.*, August, 1940, **53**) the use of a spirit lamp, the needle being passed through the flame after each injection, and the stopper of the bottle flamed before each replenishment. Experience comprising thousands of injections in clinics, schools, halls, bed- and sitting-rooms kitchens, and even—shades of Lister—by the roadside, has shown that this method, combined with iodine sterilization of the skin, is safe and well worthy of trial.

Recently, having all but exhausted one of the 25-c.cm. bottles of A.P.T. supplied by the Ministry, I submitted the dregs to examination by an expert bacteriologist. Culture under both aerobic and anaerobic conditions showed that the residuum was sterile. This bottle had been in regular use for a period of more than three weeks. The majority of the injections were 0.1 c.cm., the remainder 0.3 c.cm.; the syringe held 1 c.cm.; and quite half the injections were given singly during house-to-house visits among the poorer classes, thirty at a time being a very unusual "bag." This culture experiment is encouraging testimony to the efficiency of both the technique employed and the method of preserving the antigen.—I am, etc.,

Cross-in-Hand, Sussex, Feb. 19. H. LYNDHURST DUKE.

Permanganate for Snake Bite

SIR,—In your September 28, 1940, issue (p. 424) appears an annotation on snake bite. From time to time this subject crops up, and writers not only warn us of the uselessness of permanganate of potash but also point out its dangers. It has been my lot to have attended at least a dozen cases of undoubted snake bite in human beings and five in dogs, so far as I can remember, and one horse, both in Africa and in Australia. My practice has been to make as strong a solution

as I can in cold water and inject several syringe loads under and around the punctures. I have always feared gangrene, but considered that a patch of gangrene was better than a dead child. I have never seen any harmful effects from the injections, but rapid improvement where symptoms were bad. I have never seen a fatality in these cases.

About 1903 Sir Lauder Brunton did a good deal of research in this direction, and I became acquainted with his work in a paper called the *Medical Review*. It would be interesting for anybody who has access to these papers to look up his researches, because it does not seem feasible that a man of his qualifications and ability should be entirely wrong. This matter is of vital importance to people living in country places where snakes are prevalent and anti-venom unobtainable for some considerable time, but where permanganate of potash is in every home. All the patients seen by me had been bitten on the hand or bare leg, so there was little chance of the venom being wiped off on the clothing.

For the satisfaction of many, it would be advisable to refer to the work of Sir Lauder Brunton and to publish any experimental work that had been done in relation to permanganate of potash and snake venom and to check his results in comparison with modern research. Let us have something more definite than the remark that "permanganate of potash is not considered of any use nowadays." We folk who live among snakes feel that it is up to those who make these statements to give us concrete proof, and as our experiences are in its favour it is not likely to be discarded till that is forthcoming.—I am, etc.,

Ballarat, Victoria, Nov. 27 SYDNEY PERN

Pellagra in Great Britain

SIR,—Pellagra is generally considered to be a rare disease in this country. It is certainly rarely recognized, and I suppose few doctors except those in mental hospital practice have diagnosed many cases. My experience is probably unusual. I have seen three fully developed cases of pellagra in my own (general) practice in the past five or six years. One of these is reported in full elsewhere (*Edin. med. J.*, 1940, **47**, 81).

Whether it is rare or not, I have the impression that there must be quite a few unrecognized cases of this disease in the country. The matter is one of importance, since we now have at our command a specific cure in nicotinic acid. There are few things in the whole range of therapeutics so dramatic and so satisfactory to patient and doctor as the speedy recovery (from a serious and often fatal disease) of pellagrins when given an adequate dosage of nicotinic acid. Cure is a matter of days, sometimes almost of hours. Severe mental symptoms, such as mania, may disappear in twenty-four hours and the dermatitis and buccal lesions in a few days. In diagnosis it is useful to remember the three "D's" of the pellagra triad—diarrhoea, dermatitis, dementia.

Apart from the full-blown pellagra syndrome, there must be many cases of minor deficiency of nicotinic acid which would benefit from the exhibition of this substance. For instance, I have under my care at present a young man whose sole complaint is a very unpleasant tingling of the tongue. Nicotinic acid abolishes this symptom, which, however, recurs on omitting the treatment. Prof. H. Gordon Campbell (February 15, p. 262) reports successes in cases of "blisters of the lips."

Incidentally, it seems a pity that the Government is introducing only one factor (B_1) of the important vitamin B complex into the new loaf, and a greater pity that a more natural type of vitamin supply in the form of a wholemeal loaf should not be more widely available and consumed. There is something Gilbertian in our policy of first removing this vitamin from the wheat and then replacing it (in part) at great expense.

Recently I have been using nicotinic acid amide in the maintenance care of a case of pellagra, and find it well tolerated and possibly more effective in the prevention of symptoms.

It would be interesting to know if pellagra is occurring with any frequency in other parts of the country. There is a possibility of an increase of this and other deficiency diseases owing to war restrictions in diet.—I am, etc.,

Edinburgh, Feb. 19 DOUGLAS S. ROBERTSON, M.D.

Nurse Anaesthetists

SIR,—Anaesthesia has always been the most neglected of all branches of medicine. Although the patient's comfort and even his very life may depend upon good anaesthesia, there are still far too many places where this fact is utterly ignored, where any old thing will do provided that it is easy and cheap.

There are just a few places in the world (such as the University of Wisconsin) where real enthusiasm and encouragement exist. These have led to very great technical advances, such as the introduction of cyclopropane. Until recently, however, England, though perhaps possessing the highest average level of attainment, had no outstanding school, no Mecca to attract anaesthetists from other countries. That want has been supplied at Oxford by the generosity of Lord Nuffield, with the result that Oxford now compares favourably with the first-class American centres of anaesthesia work. I am sorry to see that Cambridge, far from emulating the progressive and enlightened spirit of the rival institution, is proposing to take a retrograde step and institute that bane of the second-rate American medical school—the nurse anaesthetist—which Canada has been wise enough to prohibit after extensive trial. Not satisfied with ignoring modern progress (and the law relating to covering unqualified practice), Cambridge is to put the clock back and give up all hope of further advance. There is a similar school of thought in India at the present time—a desire to abolish Western science and return to the era of the totem pole and the medicine man. But I never expected that Cambridge would enter this unholy competition.

It is true that technicians can be trained to give anaesthetics competently by certain methods, but this does not make them into anaesthetists. Similarly technicians could easily be trained to remove appendices, but that would not make them into surgeons. What anaesthesia needs is not deliberate retrogression but deliberate encouragement, for there is far too much bad work done already, even by men capable of better things. I personally know of two recent cases where patients were killed by an experienced man simply because of this crazy surgical insistence on cheap anaesthesia, which is so widespread as to be almost universal.

If this proposal is adopted I for one will cease to use certain Cambridge degrees which I previously thought to be of some value. I am not conceited enough to think that this will affect the university in any way, but it will at least clear my own conscience by dissociating me entirely from a reactionary policy which is in such striking contrast to the enlightened and progressive spirit of Oxford.—I am, etc.,

W. STANLEY SYKES.

"India Wants Medicine, Not Magic"

SIR,—It is exceedingly regrettable that you should have published in the correspondence columns of the *Journal* of August 24, 1940 (p. 268) Dr. M. N. Pai's letter without attempting to verify the various allegations made therein. I am only concerned with the attack made upon the quality of the equipment and qualifications of the staff of the new Stanley Medical College and the Government Rayapuram Hospital, Madras, to which it is obviously referring.

1. Among the various misrepresentations I would like to point out that it is a grossly incorrect statement that the new College is staffed with professors possessing mediocre qualifications. The College is staffed with professors possessing high academic qualifications and considerable teaching experience. In every instance best-qualified professors available from the ranks of the Madras Medical Service and from the independent medical profession have been chosen. No professor with mediocre qualification has been taken in preference to competent Indians with British qualifications available on the spot.

2. No lady nurses were discharged; on the contrary, the nursing staff has been considerably increased.

3. Numerous additions to house the various departments of this teaching institution have been made to the Government Rayapuram Hospital, and also new buildings of the Stanley Medical College are nearing completion, having been con-

structed with due regard to all the requirements of a rapidly growing up-to-date and well-equipped scientific teaching institution.

I enclose herewith: (1) a detailed statement showing the staff of the Government Rayapuram Hospital and Stanley Medical College with their qualifications; (ii) a statement showing the accommodation available and the number of patients received in the Government Rayapuram Hospital, both out-patients and in-patients, as well as in the various special departments of the hospital which afford opportunity for clinical teaching; (iii) a statement of the existing nursing staff as compared with staff available before the inauguration of the Stanley Medical College.

I would like to add that the institution, which at present is recognized only for the purpose of teaching the pre-registration and the first- and second-year subjects, is to be shortly visited by the Madras University Commission and its requirements assiduously studied. Further additions and improvements to the equipment and staff are under consideration by Government.

I trust that you will give wide publicity to the above, as otherwise members of the medical profession, particularly outside India, are likely to have grotesque and distorted ideas of the nature of medical relief available in this country and give an impression abroad that India is a land of magic and quackery.—I am, etc.,

G. DINKER RAU, M.D.,
Madras, Nov. 18, 1940. Principal, Stanley Medical College.

An American Surgeon's Assurance

SIR,—I think that readers of the *British Medical Journal* will be interested in the subjoined extract from a letter received from the U.S.A. this morning. It was written by a surgeon and dated January 7, when the Lease-and-Lend Bill was in its infancy, and it indicates how widespread at that time was the desire to help Britain to the utmost.

> "You, I mean England, is having enough trouble. We are going to do everything to see that England does not fall. To you it may seem slow. A few months more will make a difference that even you will not believe. You will read of opposition, but it is a small minority—but vociferous."

—I am, etc.,

London, W.1, Feb. 18. ARNOLD LAWSON.

Greetings from Mexico

SIR,—We have received in the offices of the *Gaceta Médica de México*, organ of the National Academy of Medicine, the Centennial Number of the *British Medical Journal*, for which we thank you profoundly. As Editor of the *Gaceta*, it gives me great pleasure to send you my sincere and cordial congratulations upon the centenary just celebrated, which marks an epoch in the history of the world medical press. It is my hope that your illustrious *Journal* will continue its existence as, in the words of Sir D'Arcy Power, "the representative organ of the medical man in general practice." May the *British Medical Journal* continue working, as in 1840, for "the maintenance of the honour and respectability of the medical profession."

This noble programme, which has been maintained and has gathered strength for 100 years, is an example to all the medical papers of the world, which I believe that they should follow, as they should also bear in mind what the founders of the *British Medical Journal* said in 1840 when they affirmed that scientific questions and practices related to medicine should be considered "not merely in the light of personal struggle, on the part of the medical man, for his own individual rights and privileges, but also as part of the system of a wise and effective form of government, in which the health and lives of the people become equally objects of attention with the regulation and preservation of the rights of property." Such wise and altruistic rules of conduct acquire in this painful epoch a vibrant reality and are a clear declaration of the great democratic spirit of England, which has always fought and continues to fight for the preservation of the fundamental rights of man, winning by its extraordinary example of fortitude and confidence the admiration of the whole civilized world.

Please receive this testimony of the cordial sympathy and the justified admiration of the *Gaceta Médica de México*, which celebrated its 75th anniversary in 1939, and our sincere wishes that the *British Medical Journal* should continue to bear the standard of medical ideals and, above all, that England, the mother of human liberties, should emerge from these calamitous times victorious in the struggle for the salvation of democracy and humanity. And as an objective demonstration of these sentiments, I ask you to receive henceforth the *Gaceta Médica de México*, which we shall be very pleased to send you, so that it may occupy a place among the other numerous medical publications that you certainly receive from all parts of the world.

I take advantage of this opportunity to assure you, Mr. Editor, of my attention and consideration.

DR. ALFONSO PRUNEDA,
Dec. 11, 1940. National Academy of Medicine, Mexico.

*** It gives us much pleasure to publish this translation of a letter from a brother Editor. We thank Dr. Pruneda for his congratulations and reciprocate his good wishes.—ED., *B.M.J.*

The Flannel Hood Respirator

SIR,—I feel obliged, very reluctantly, I admit, to refer to the appreciation of the late Colonel Sir William Horrocks in your issue of February 15 (p. 258). Sir Leonard Hill, the author, makes an error in supposing that Sir William Horrocks was the designer of the flannel hood respirator for the use of the British Army. This was suggested to the Central Laboratory at G.H.Q. by Captain Cluny MacPherson of the Newfoundland Forces (Medical Corps) as a type of respirator that might do. The Central Laboratory sent Captain MacPherson over to London with his respirator, and I myself was present when he arrived and showed his hood to Colonel Horrocks. I am quite sure that Colonel Horrocks went out "and ordered the flannel on his own responsibility." Such a course was quite in keeping with his character and just like him. He was one of the most charming men and one of the least likely to take up an attitude of waiting for something that seemed to him important. But that he designed the hood respirator is not true. Probably Sir Leonard Hill got the impression that he did so, but the facts are as stated.—I am, etc.,

S. LYLE CUMMINS,
Feb. 18. Colonel (R.P.), late R.A.M.C.

MOBILE PHYSIOTHERAPY UNIT FOR THE RED CROSS

The first mobile physiotherapy unit for the treatment of men in the Forces was presented by the Chartered Society of Massage and Medical Gymnastics to the War Organization of the British Red Cross and Order of St. John on February 21. Lord Horder, president of the Chartered Society, in making the presentation, said that in July last a member of the Society's council, Miss B. A. Wilson, brought forward the proposal that as a contribution to the nation's war effort subscriptions should be collected for the provision of mobile physiotherapy units. Her plan was that such units should be mounted in a small motor van so that they could be brought in any district to convalescent homes and hospitals which were not large enough to have a department of physical medicine. The proposal was adopted, and this first unit was subscribed for in the town and district of Sevenoaks, which name appeared on the van with the Society's coat of arms. The unit, which is to be staffed by a masseuse and a Red Cross driver, contains all the apparatus for giving electrical and light treatments, including infra-red and ultra-violet rays and paraffin wax baths, but apparatus for diathermy and high frequency is absent, the use of these methods being at present prohibited. The various apparatus and its accessories are mounted on four trolleys, which can be wheeled into the hospital. The unit was accepted on behalf of the War Organization of the two Societies by Sir Philip Chetwode, who said that it would be stationed in Warwickshire. It is the desire of the Chartered Society to provide a fleet of such units for use in all parts of the country, and later with the Forces abroad if necessary.

Obituary

PROFESSOR WILLIAM BULLOCH

M.D., LL.D., F.R.S.

William Bulloch was born at Aberdeen on August 19, 1868, the younger son of the late Mr John Bulloch. He studied medicine in Aberdeen University, being a student of Hamilton, graduated M.B., C.M. with the highest honours in 1890, and took his M.D. with similar honours in 1894, winning in the same year the Struthers Gold Medal and Prize in Anatomy. For one year after qualification he was assistant to a doctor in practice, but, feeling that he "had done nothing save shown some kindness," he "decided that there must be something to learn in the world." With £100 and no knowledge of German he went by cargo-boat to Hamburg and thence to Leipzig, where he was accepted as a voluntary assistant by Birch-Hirschfeld. He then went to Vienna to learn practical medicine, studying under Politzer, Caposi, and others. He returned by cargo-boat to Aberdeen, and that night met his fellow-student Arthur (now Sir Arthur) Keith, who persuaded him to come with him next day to try his fortune in London. He was told on arrival that there was no prospect for him unless he had the Conjoint qualification, but he was made assistant to David Ferrier at King's College, and was later appointed Assistant to the Professor of Pathology of University College, Victor Horsley, who enabled him to study under Émile Roux in Paris. He was a pupil also of Salomonsen of Copenhagen. From July, 1895, to June, 1897, he was bacteriologist in charge of the antitoxin laboratories of the Lister Institute at Sudbury. He was elected bacteriologist to the London Hospital on June 27, 1897, became Goldsmiths' Company Professor of Bacteriology (London University) in the London Hospital Medical College in 1919, retired in 1934, and was immediately appointed Consulting Bacteriologist to the London Hospital and Emeritus Professor of London University. After his retirement until the outbreak of war he still came daily to work in his old room, looking after the sterility of the London Hospital catgut. He was elected F.R.S. in 1913 and made LL.D. Aberd. in 1920. He was Horace Dobell Lecturer to the Royal College of Physicians in 1910, Tyndall Lecturer to the Royal Institution in 1922, and Heath Clark Lecturer in 1936.



Bulloch was a very hard and methodical worker. For years, until his services were required on various committees, he worked at the London Hospital from 10 a.m. to 4 p.m., read in the library of the Royal College of Surgeons until it closed, had supper at home, and then read till bed-time: on Sundays he read until about 6 p.m., then dined in a restaurant and ceased work for the day. He was endowed with an astonishing memory and, like his elder brother, John Malcolm, LL.D. (1867–1938), inherited great literary ability from his grandfather, John Bulloch (1805–82), and his father (1837–1913). His great learning included general history as well as his own subject. By visits to congresses he extended his knowledge of foreign workers and languages, and came to know personally every pathologist of note. Paul Ehrlich was a particular friend. His greatest characteristic was the high standard of accuracy he set himself and expected of others. This made him a severe critic and had a profound influence upon everyone in the London Hospital. Although he appeared to remain isolated in his own department he had an uncanny way of knowing everything that was going on, and all workers, whether bacteriologists, morbid anatomists, physicians, or surgeons, knew that any slipshod work, writing, or speech would be severely criticized: even a lay member of the staff would take care that anything he wrote escaped Bulloch's criticism. All learned that every reference or quotation must be searched to its source, and an accurate transcript be made of it and the title of the book or paper from which it came. Any faulty reference was immediately recognized by him and shown up. His quick mind, accurate knowledge, and orderly method of thought made him speak spontaneously as clearly as he wrote, and he was a formidable witness in courts of law. Of the old school, he did his practical work with his own hands, and was remarkably skilled in all branches of pathological technique.

At the London Hospital he lectured on bacteriology, general pathology, and at one time more advanced bacteriology for the diploma of public health. The lectures were crowded with accurate information, and his personal knowledge of foreign workers gave his descriptions of their experiments and discoveries a remarkable reality. It was difficult to believe that Bulloch had not been a spectator when he gave his full and dramatic account of the biting of the boy Joseph Meister by a mad dog, the rush to Pasteur, and the anxiety and excitement over the treatment until its success was proved. He was an inspiring teacher. Relatively few graduates worked with him as assistants or pupils, but in a list of seventeen which the writer has obtained are E. E. Atkin, T. H. C. Benians, S. L. Baker, Charles Bolton, P. Fildes, M. Greenwood, J. C. G. Ledingham, J. McIntosh, J. McCunn, H. P. Parker, R.N., H. M. Turnbull, F. M. Twort, and G. T. Western.

Bulloch published in British and German journals at least thirty papers embodying original research. The first was in *Brain* in 1892, and in 1894–5 there were two further contributions to neurology, one to morbid anatomy with Georg Schmorl, and one to dermatology with G. Pernet. His first bacteriological paper was on *Strep. pyogenes* in 1896. After that all contributions were to bacteriology, serology, immunity, and the treatment of bacterial disease, except two further dermatological papers, with Pernet (1896) and with N. W. Holmes (1902), and a paper with J. H. Sequeira (1905), "On the Relation of the Suprarenal Capsules to the Sexual Organs"—a milestone in endocrinology. His last two bacteriological papers were concerned with the viability of bacteria in antiseptic solutions, both in 1928. He also wrote upon the teaching of pathology in Great Britain (1903), on the use and abuse of scientific medical literature (1921), and foot-and-mouth disease in the sixteenth century (1927). Further, he wrote appreciations of Pasteur, Spallanzani, Lewis, and Cobbold (1922), Lister (1927), and Robert Koch (1932), and obituaries of Emanuel Klein (1925), Charles Creighton (1928), Haffkine (1931), Kitasato (1931), Émile Roux (1934), and Theobald Smith (1935). These publications upon scientists show clearly his thoroughness, accuracy, and literary skill. A notable example of his contributions to books is "The Pathology, Bacteriology, and Specific Treatment of Pulmonary Tuberculosis" in Allbutt and Rolleston's *System of Medicine*, vol. v, 1909.

The following are larger works. He edited and contributed to "Studies in Pathology, written by Alumni to Celebrate the Quatercentenary of the University of Aberdeen," Aberdeen, 1906. He contributed in 1909 the articles on diabetes insipidus, pulmonary tuberculosis, chronic hereditary trophoedema, angioneurotic oedema, hereditary malformation of the genital organs, and hermaphrodism to the *Treasury of Human Inheritance*, Parts 1 to 3, and, with Paul Fildes, to Parts 5 and 6, 1911, the acknowledged classic on haemophilia. His Horace Dobell Lecture, delivered before the Royal College of Physicians of London on November 10, 1910, entitled "The Problem of Pulmonary Tuberculosis, considered from the Standpoint of Infection," was published by the School Press, London, in 1911. With the late Sir F. W. Andrewes and others he wrote *Diphtheria: Its Bacteriology, Pathology, and Immunity*, published by the Medical Research Council in 1923. He contributed to *A System of Bacteriology in Relation to Medicine*, published in nine volumes, 1929–31, by the Bacteriological Committee of the Medical Research Council, of which he was chairman. His unique work with Lampitt and Burhill on *The Preparation of Catgut for Surgical Use* was published in 1929 in the Special Report Series No. 138 of the Medical Research Council. In 1938 he published *The History of Bacteriology*, based upon his Heath Clark Lectures of 1936—an outstanding contribution to medical history.

In the above no mention has been made of many important contributions to medical science published independently from his laboratory by his pupils, particularly Fildes and McIntosh.

He was elected to numerous administrative posts. He was an original member of the Medical Research Committee (later, 1920, Council), member of the Government Committee on Foot-and-Mouth Disease, member of the Executive Committee of the Imperial Cancer Research Fund, member (1918), and later (1932 to his death) Chairman, of the Governing Body of the Lister Institute, member of the Committee of the Beit Memorial Trust, Consultant to King Edward VII Sanatorium, and President of the Section of Pathology of the Royal Society of Medicine (1917). From 1925 to 1935 inclusive he was Honorary Librarian of the Royal Society of Medicine, and was made an Honorary Fellow of that society in 1940. He examined in the Universities of London, Leeds, and Liverpool, and for the Royal College of Veterinary Surgeons, and was induced to reappear as an examiner when the Conjoint Board first introduced an examination in pathology.

Bulloch had a great sense of humour, could enjoy a joke against himself, was an inimitable raconteur, and inherently sociable: he had a remarkable aptitude for getting to know personally and remembering everyone with whom he came in contact, however humble. Those who worked with him will never forget his great kindness and generosity. In 1923 he married Irene Adelaide, widow of Mr. A. A. Baker, and the happiness that his marriage brought him was obvious to his friends. Several years before he retired his colleagues were dismayed to see gradually increasing signs of paralysis agitans. He did not, however, allow his illness to interfere with his work. In 1939 he learned Italian in order to make better progress with another work upon Spallanzani, and last Christmas he sent to the publishers a second edition of his classic upon surgical catgut. In the last eighteen months his condition deteriorated rapidly. He was admitted to his old hospital on February 9, 1941, and died on the 11th.

We offer our deep sympathy to his widow and her daughter.

H. M. T.

[The photograph reproduced is by Russell, London.]

THE REV. S. D. BHABHA, M.D.

The Rev. Shapurji Dadabhai Bhabha died on January 3 at the age of 86. He was born in the city of Surat of devout Zoroastrian parents, and claimed descent from an old noble Persian family dating back to the thirteenth century. At the age of 14 he was sent to the Irish Presbyterian School, and in 1874 became a convert to the Christian faith.

He came to Glasgow in 1876 and studied theology and medicine at the same time. He qualified L.R.F.P.S. and L.M. in Glasgow in 1880, took his L.S.A. in 1883, and M.D. Brux. in 1884. He was later ordained priest in the Syrian Church at St. Mark's Monastery, Jerusalem. He settled in New Cross over forty years ago, and was connected with medical mission work, especially the East End Mission to Jews, besides undertaking an extensive private practice in his own neighbourhood. He became a member of the B.M.A. in 1881 and was representative of the Greenwich and Deptford Division from 1913 to 1937 and was chairman of the Division in 1925–6. He took a very keen interest in the work and meetings of the Representative Body, and was very delighted when he was able to complete his "jubilee" as representative at the Belfast Meeting. He was an enthusiastic upholder of the rights and responsibilities of the profession, and regarded with stern disfavour any falling away from the highest principles of medical conduct and ethics. His health began to fail soon after the Belfast Meeting, and a young relative, a great-niece, came over from India to care for him.

Dr. Bhabha inspired a great affection amongst his patients, and many visited him during his last illness. The present war was a great blow to him, but he never lost courage, and refused to leave his home in spite of the ferocity and noise of the air attacks. His was a simple nature, combining the qualities of priest and physician, and his courage and fortitude, his love for his fellow man, and his hatred of evil were an inspiration to those around him.

Dr. WILLIAM KIRKPATRICK, who died on February 8 at Sherborne, aged 79, was one of the sons of the Rev. George Kirkpatrick, rector of Castlepollard, Co. Westmeath, Ireland. Like his brother, Lieut.-Colonel Henry Kirkpatrick, I.M.S. (ret.), he was educated at Marlborough and at Trinity College, Dublin. He had a distinguished undergraduate career, winning the senior classical gold medal and the senior Berkeley gold medal in Greek in the year 1885, and was senior classical scholar. After graduating M.D., B.Ch. in 1889, he practised at Stourbridge, Worcestershire, until the last war, when he was placed in command of the military hospital there with the rank of lieutenant-colonel, R.A.M.C.T., and was twice mentioned in dispatches. Dr. Kirkpatrick practised at Sherborne from 1922 until 1937; he was for eleven years a member of the Urban District Council, and its chairman in 1928.

Dr. ERNEST FREDERICK LIONEL DE JERSEY, formerly surgeon to the Victoria Hospital, Guernsey, died on February 11. He was born in May, 1872, at Lymington, Hants, son of the Rev. C. C. de Jersey, and after schooldays at Wimborne Grammar School and Elizabeth College, Guernsey, entered Glasgow University as a medical student, taking the Scottish triple qualification in 1897 and the M.B., Ch.B. a year later. Before settling in practice in Guernsey he had been senior assistant medical officer at the Burntwood Asylum, Lichfield, and house-surgeon to the Morpeth Dispensary and to the Royal Berks Hospital, Reading. During the last war he served with the rank of major R.A.M.C. as senior medical officer to the Royal Guernsey Militia Home Service. Dr. de Jersey joined the British Medical Association in 1906 and was chairman of the Guernsey and Alderney Division in 1926–8. He had practised at Surbiton, Surrey, in more recent years.

We regret to announce that Dr. CLAUD BUCHANAN TICEHURST of Appledore, Kent, died at the Royal East Sussex Hospital, Hastings, on February 17. He was the youngest of the three medical sons of Dr. Augustus R. Ticehurst, J.P., of St. Leonards-on-Sea, who all went from the same house at Ton-

bridge School to Cambridge University and thence to Guy's Hospital. He graduated B.A. in the Natural Sciences Tripos, and while a clinical clerk at Guy's wrote jointly with Dr. Herbert French a paper on the relation of traumatic diabetes insipidus to glycosuria which was published in 1906 in the *Guy's Hospital Reports*. He qualified M.R.C.S., L.R.C.P. in 1907 and took his M.A. and B.Ch. degrees at Cambridge, and then served as house-physician and resident obstetrical officer at Guy's. After further experience of hospital work and in general practice he entered a partnership at Lowestoft, and was appointed assistant surgeon to the Lowestoft and North Suffolk Hospital. Dr. Ticehurst joined the British Medical Association in 1911 and was chairman of the North Suffolk Division in 1926-7. A year later, on leaving Lowestoft to set up in practice at Appledore and Ham Street, near his old home, he was elected consulting surgeon to the North Suffolk Hospital. Like his eldest brother, Mr. Norman F. Ticehurst, F.R.C.S., author of the *History of the Birds of Kent* and joint author of *A Handbook of British Birds*, Claud Ticehurst was a keen member of the British Ornithological Union and Club and had edited the Society's *Transactions*; he was also a Fellow of the Royal Geographical Society.

Dr. WILLIAM TAYLOR DOYLE ALLEN, a member of the British Medical Association for nearly forty years and chairman of the Liverpool Division in 1922, has died at Heswall, Cheshire, where he lived in retirement after practising for many years at Mount Pleasant, Liverpool. He studied medicine in Dublin at the School of the Royal College of Surgeons, and graduated M.B., B.Ch., and B.A.O. of the Royal University of Ireland in 1895. He was then for some time resident medical officer to the Liverpool Parish Infirmary, and acted as local medical officer for the L.M.S. group of hotels and as honorary physician to the Liverpool School for the Blind. For four years during the last war Dr. Allen was medical referee to the local War Pensions Committee.

Dr. ROBERT CECIL TURLE EVANS has died at the age of 69 at Herne Bay, where he practised for twenty-seven years and closely associated himself with many of the town's institutions and activities. After studying in London University College and Hospital he qualified as L.S.A. in 1906, and two years later graduated B.Sc., M.B., and B.S.Lond., taking also the English Conjoint diplomas and the D.P.H. For some years Dr. Evans had been a demonstrator in chemistry at St. Bartholomew's Hospital, and coached students in chemistry and physics at a house in Bloomsbury. He began practice at Herne Bay in 1908, and in 1915 joined the R.A.M.C., serving with a temporary commission in Malta, Egypt, Mesopotamia, Persia, and India. Returning to civilian practice in 1920, Dr. Evans did good work as surgeon to the local division of the St. John Ambulance Brigade, and was medical officer to the Herne Bay Infant Welfare Centre until his retirement from practice in 1932. Three of his children are members of the medical profession.

The late Dr. JULIUS BARNET SINSON graduated with honours as M.B., Ch.B. of Leeds University in 1911 after holding several scholarships. The son of a Rabbi now a venerable and beloved figure in the religious life of the Leeds community, he was a fine type of medical practitioner. Dr. Sinson, who joined the British Medical Association in 1920, had been in general practice in Newcastle-upon-Tyne for twenty-two years, and his passing has evoked demonstrations of sympathy and regret from among his many patients. During the last war he served with the rank of captain, R.A.M.C.

The following well-known foreign medical men have died: Dr. OLIVER THOMAS OSBORNE, emeritus professor of clinical medicine at Yale University School of Medicine, aged 77; Dr. MAX NADOLECZY-MILLIOUD, at Zurich, formerly professor of otology and laryngology at Munich; Dr. KURT HULDSCHINSKY, the German-Jewish discoverer of the ultra-violet-ray treatment for rickets, at Alexandria; Dr. VITTORIO PUTTI, the orthopaedic surgeon of Bologna; Dr. PHILIPP BROEMSER, professor of physiology and rector of the University of Munich, formerly professor of physiology at Basle, aged 54; Dr. JOHN AUGUSTUS HARTWELL, emeritus professor of clinical surgery at Cornell University Medical College and president of the New York Academy of Medicine, aged 71; and Dr. KARL HEDÉN, a Stockholm dermatologist, aged 59.

Medico-Legal

HYSTERIA CAUSED BY SHOCK WITHOUT PHYSICAL INJURY

At the February Norwich Assizes, before Mr. Justice Atkinson, Mrs. Esther Englestown brought an action against two defendants, Mr. G. Shead and Mr. H. Hardy, for negligence. It was stated by her counsel, Sir Charles Doughty, K.C., that in February, 1937, a motor-car driven by Mr. Shead collided with a lorry driven by the second defendant with the result that the car left the road, crossed the footpath, and came to a standstill in the garden of a house. Mrs. Englestown had to jump aside to avoid the car, but she was never touched by it and sustained no organic injury. She was greatly frightened, lost her nervous control, and her state had gradually deepened into one of profound hysteria, so that now, four years after the accident, she was practically confined to bed, complained of severe pains in various parts of the body, and was quite unresponsive to medical treatment. She was 49 years of age.

The Medical Evidence

Dr. J. H. Owens of Long Stratton testified that he was called in to see the plaintiff about three weeks after the accident, and had attended her ever since. She was highly emotional and had been getting worse. She complained especially of pains in the leg, and on any attempt to move it or touch it she cried and behaved in a hysterical manner. She stated that the thought of the motor-car coming towards her was always present to her mind. He considered she was not malingering, but that her condition was functional. He had supplied her with medicine to steady her nerves and enable her to sleep, and in June, 1939, he saw her in conjunction with the medical superintendent of the county mental hospital, who advised treatment in an institution, to which, however, she would not submit. Her present condition was one of extreme nervous hysteria with hyperaesthesia of the limbs. Since the accident he had paid her 183 visits and supplied 230 bottles of medicine, and his bill, with four consultations with other medical men, came to £132 7s. In reply to the judge he said that he agreed that institutional treatment was desirable, but he was not sure that the mental hospital was the most suitable place. The medical superintendent, however, had "guaranteed" to cure her within a matter of months.

Dr. B. B. Morgan, honorary physician, Norfolk and Norwich Hospital, said that he saw the plaintiff on January 18 last. She complained of pain in the side and leg. She had two emotional attacks while he was present, one when someone mentioned the word "motor-car" and the other when he was testing her plantar reflex. He found no evidence of organic disease. She held her hands curiously with the tips of the fingers tightly pressed together, the palms concave, and the wrists slightly extended; her right leg was pressed against the shin of the left. He thought treatment in a mental hospital in the wing set apart for voluntary patients might have a good effect.

Mr. Charles Noon, consulting surgeon to the Norfolk County Mental Hospital, said that he saw the plaintiff in May, 1937, and in January, 1941. She would not allow him to touch her. At his first visit she complained of pain more or less localized to the right hip, and he suggested an x-ray investigation as a precaution, though he did not think it likely to reveal anything. At his second visit her mental condition was worse. She now complained of intolerable pain in the palms of the hands. One slight thing which struck him was the intense dislike she conceived for a colleague's fountain pen. His view was that had she consented to undergo institutional treatment after the accident a course of three to six months would have cured her. His lordship asked what effect it would have if a bomb dropped near her bungalow, and the witness agreed that it might have a revivifying one. He added that she was quite capable of jumping; all her muscles reacted quite well. As a rule the really hysterical patient was glad to get treatment, but here there was a refusal on her own

part, and that of her husband and daughter to take the necessary measures.

Dr. Oliver G. Connell, medical superintendent, Norfolk County Mental Hospital, said that he saw this woman in June, 1939, in company with her doctor. He suggested institutional treatment, but she showed no inclination to co-operate, and her husband said she would not stand the journey. There was no reason why as a ratepayer in the county she should not enter his own hospital as a voluntary patient. The hospital had sixteen wards and she would be grouped with patients like herself. He could not conscientiously certify her. With her when it came to making up her mind it was a case of "would not" rather than "could not."

Dr. A. J. Cleveland, honorary physician, Norfolk and Norwich Hospital, said that he examined the plaintiff a year ago. He was convinced that she was not suffering from any organic lesion. As one piece of inconsistency she shrieked when he touched the palms of her hands, but on leaving he shook hands with her, pressing the palms firmly, and she showed no sign of pain. It was a severe case of hysteria; her physical condition was good, but she was sympathized with by her husband and daughter to an extent that was unreasonable and most harmful. The only treatment was to get her away from her surroundings, and he could not agree that any attempt to compel her to make the journey would have serious consequences.

Judgment for the Plaintiff

After hearing evidence as to the conditions of the accident, his lordship gave judgment for the plaintiff against the first defendant, Mr. Shead. He said that for the first two years and four months after the accident the woman was solely under the care of Dr. Owens, and during nearly all that time she was in bed, making no effort to get up, and gradually becoming worse. He was satisfied that Dr. Owens never suggested during that time any treatment other than that which he was giving—namely, soothing medicines. No suggestion was made to her that she ought to go away to a nursing home. She followed the medical advice until June, 1939, and no blame could attach to her during that period. Her pain might have been real or imaginary, but the result to her was the same. In June, 1939, Dr. Connell saw her in company with Dr. Owens, and the advice was given to her and her husband, with which Dr. Owens concurred, that she would never get better unless she went into an institution. Various institutions were mentioned—Tavistock Clinic and the Queen Square Hospital in London, and the voluntary wing of the county mental hospital. The woman refused, however, and her husband—an obstinate man, as was plain from his evidence and demeanour in the witness-box—upheld her in her refusal. He (the judge) would not use the word "malingering," but he did not believe that this woman had ceased to have a will of her own: she was capable of making up her mind negatively—that is to say, of refusing to do a thing. There was no reasonable excuse for not following the advice of the medical specialists from June, 1939, onwards, and had she done so she might have been quite well now for twelve months. In assessing damages he thought that £100 had been properly incurred in medical expenses, and £50 in domestic assistance, and that cure undertaken in an institution might cost another £100. Therefore £250 would rank as special damages, and for her pain and suffering he awarded £450, making £700 in all. He awarded it against Mr. Shead, who in his view was responsible for the accident, and ordered him to pay the plaintiff's and the second defendant's costs. He added that he hoped it would be conveyed to the woman that in his, the judge's, view she had been acting entirely wrongly since June, 1939. He was amazed that anyone should have been so foolish as to refuse to do what she had been advised by all the doctors who had seen her.

The Central Council of Recreative Physical Training has published its fifth annual report, for 1939–40, from 58, Victoria Street, London, S.W.1. In the interests of national economy a full report has not been printed and the Council contents itself with brief notes indicating the extent and diversity of the work carried out during the year ended August 31 last.

Medical Notes in Parliament

The Nation's Food

In a debate on food supplies, which was opened in the House of Lords on February 18 by Lord Bledisloe, Viscount DAWSON OF PENN spoke of the disproportion between the rations allotted to civilians and those of soldiers. There was a case for the review of Army rations. Up to now there was no evidence of malnutrition through rationing. The young were well, in good health and colour, and alive with energy. There was in certain parts of the adult population a reduction of weight which should be noted, though it was not of any moment just now. Meat was a source of first-class protein, appetizing and satisfying, but these virtues could be supplied by smaller amounts than the nation's previous habits had demanded. An immense civil population now recognized that less meat was needed. By curtailing meat Lord Woolton would do no harm, provided the nation had access to wholemeal bread, milk, cheese, potatoes, leaf vegetables, and fruit. Cheese and meat were largely interchangeable. Farmers would produce more milk if the urgency of the need was made clear to them. Importation of powdered whole milk and powdered skim milk should be undertaken to full capacity. Vegetable protein in the form of powder should also be imported. Cheese was invaluable and its present absence from the dietary was a serious loss. People should not be deprived of meat and cheese at the same time. He welcomed the standard wholemeal loaf; the grain, he said, must be milled to avoid too much roughage—this could be done by some of the newer methods. Fruit should be put into storage in the anxious year to come. He supported the plea for the production of eggs, which were specially valuable for sedentary workers and for the tired and the dyspeptics.

Lord WOOLTON said he had assured an adequate supply of white bread, but not until spring would it be fortified with those things which scientists assured him were necessary. The supply of wholemeal bread would be equal to the demand. The greatest weakness was in the animal protein foods—bacon, eggs, cheese, and meat. He was concerned at the shortage of these commodities, and especially of cheese. So long as the Mediterranean campaign went on he saw no possibility of increasing the meat ration from the present 1s. 2d. per head per week. Oils had been provided to suffice for a long time, but they would not be able to maintain the present output of food in this country for pigs and poultry, cattle and sheep. If they gave more food to the hens they would take it away from the cattle, but it would not be taken from the dairy herds, which must be maintained at almost any cost. He had told the dairy farmers what was needed in the way of milk, and had laid down generous prices for twelve months ahead. He had asked the Ministry of Agriculture for additional acreages of carrots and onions. Carrots were important, because supplies of fruit, whether home-grown or imported, would not be more than half what they had been in the past. Months ago the importation had been arranged of all the powdered milk and all the skimmed milk which could be got from overseas. Stocks were held so that in an emergency they would ensure that the children and those in hospitals were fed with milk. They would import oranges to the greatest possible extent. He had done his best to treat the poultry keepers well. He had asked that the personnel in the Fighting Forces who were engaged in sedentary occupations should be rationed on the same level as the civil population. He hoped this would soon be done.

Lord BLEDISLOE, in thanking Lord Woolton, asked that tinned vegetables should not be put on the market in the summer months.

FREE MILK AND MEALS FOR CHILDREN

Lord ASTOR inquired, in the House of Lords on the same day, whether the Government intended to subsidize meals, especially for pregnant women and for children, to improve the physique, health, and mental development of the rising generation. He said the consumption of milk under the cheap milk-in-schools scheme in October, 1938, was 2,500,000 gallons. A year later, in October, 1939, it had fallen to 1,500,000

gallons. He quoted from the circular on the provision of meals which had been issued in July, 1940, by the Board of Education in consultation with other Departments. He asked Lord Woolton to compare the present position with that in July, 1940. Lord Astor recalled that in the last war he had been chairman of a committee which indicated that if all children had the milk which the medical profession thought that they should have, there would, at some periods of the year, be no milk for the adult population. Under Lord Woolton's milk scheme, which came into operation on July 1, 2,500,000 people were benefiting a few weeks ago. That was a huge contribution to the physical and mental welfare of the child population. He urged the House to see that this advance was not given up when peace came and to do what it could to extend the principle to children over 5. He hoped Lord Woolton would give publicity to the Oslo breakfast and that in this war local authorities would recognize to a greater extent their responsibility for providing meals for children. Lord GIFFORD suggested that when commodities such as oranges were only available in small quantities infants should be given the preference. Infant welfare centres and baby clubs might be trusted with seeing that the oranges reached the infants who required them.

Lord WOOLTON said local authorities were heavily burdened, but in the subject which Lord Astor raised they were making progress. The consumption of milk in schools had indeed dropped by 1,000,000 gallons, but the consumption of milk by the population as a whole had increased by 5,000,000 gallons a month. Consumption of milk by people recognized as having prior necessity had risen to 10,000,000 gallons a month. The nation was drinking and was likely to continue to drink all the milk the agricultural industry could provide. The number of local authorities providing extra meals under the Board of Education circular of July, 1940, had increased to over 250, and the President of the Board of Education was pressing on still further. That circular referred not only to meals for necessitous children but to meals for other children. Under war conditions, when women were drawn into factories, there was more need for meals in schools. He had taken steps to ensure communal feeding centres throughout the country to deal with emergencies arising under war conditions. The Government was subsidizing foodstuffs to £82,000,000 per annum, so that food would be available to people at prices they could pay. He hoped a decision would be taken at the Ministry of Food in the course of that day about orange-juice for children.

Ill-health after Recruitment

During a debate on war pensions in the House of Commons on February 18, Sir HENRY MORRIS-JONES said that he was troubled by the number of men passed into the Army as fit by the medical boards who subsequently came under the responsibility of the Ministry of Pensions, which categorically turned them down on the grounds that the disability had not been contracted during service. It was admitted that medical boards were efficient and knew their work, and it must be accepted *ipso facto* that when a man was passed as a recruit for service he was at that time fit for service. The Ministry of Pensions had no right, if an individual contracted disability in the war, to get out of liability by saying that the disability might have been contracted if the individual had been in civilian life. He urged the Minister of Pensions to review the whole position of original acceptance by medical boards in relation to subsequent disability.

Sir WALTER WOMERSLEY said that Sir Henry Morris-Jones knew very well, as a medical man, that there were certain things that might be troublesome to an individual, but did not show themselves at the time of examination unless there was a proper examination by means of *x* rays. Having seen the attestation papers of many men he (Sir W. Womersley) had found that they had answered "No" to certain questions. The men themselves had been responsible for deceiving the examining doctor, and afterwards it had transpired that six years before a man had been under treatment for something from which he had said he had never suffered. The position he had taken up was that it had to be proved to him that a man had suffered from a constitutional disease, and that it was ascertainable from his medical record.

R.A.M.C. Help to Civil Authorities

Replying in the House of Lords on February 19 to Lord Davies, Lord CROFT said the War Office was willing to provide facilities for training the R.A.M.C. in urban areas or to assist hospital services in that district where this did not interfere with unit training in military formations or where the military commanders agreed that the units could be detached for the assistance of civil authorities. Lord Davies had asked for this assistance to urban areas which had suffered or were likely to suffer heavy casualties by enemy action. He suggested that the R.A.M.C. units might assist the first-aid and hospital services in such districts. He further asked whether opportunities would be given for units stationed in rural areas to assist the medical authorities in districts subjected to intense raids. Lord CROFT said he noted the further suggestion. It might be difficult and expensive to move units from country to town.

Calcium Content of Food

Sir ERNEST GRAHAM-LITTLE asked on February 19 for the publication of evidence in regard to the percentage of the population who under the present dietary regime exhibit calcium deficiency; and also for a statement by a recognized medical authority that the added calcium would in no circumstances injure health. Major LLOYD GEORGE said there was evidence that a considerable proportion of the population lived on diets which did not supply sufficient calcium for a desirable nutritional condition. This evidence had been provided by dietary surveys, and had been accepted by the leading nutritional experts at such representative conferences as the Technical Commission on Nutrition of the Health Organization of the League of Nations. It had been published in the Reports of the League of Nations. Lord Woolton would consider the last part of Sir Ernest's question before a decision was taken as to the quantity of calcium salts to be added to flour. The Medical Research Council had made its recommendation on the proposal to add calcium to bread before the Government announced its intention to add calcium to flour.

Mr. SEYMOUR COCKS asked Major Lloyd George on February 25 whether the *British Medical Journal* had not published evidence that the addition of calcium to bread was injurious, particularly for those suffering from kidney trouble. Major LLOYD GEORGE drew Mr. Cocks's attention to an article in the *British Medical Journal* which, he declared, said exactly the opposite.

Temporary Registration of Alien Doctors

Sir HENRY MORRIS-JONES asked on February 20, in connexion with the recent regulation permitting the temporary registration of alien doctors in this country, how many alien doctors had so far been granted this recognition; how many were in the Services; and whether the present machinery for facilitating this registration worked satisfactorily in view of the present urgent demand for trained medical personnel. Mr. ERNEST BROWN replied that eighteen alien doctors, all citizens of the U.S.A., had so far been registered under an Order of September, 1940, which applied only to such citizens and to Canadians. He was not aware that any of this group of doctors were in the fighting Services. Under a more comprehensive Order of January, 1941, the cases of some hundreds of alien doctors, who were of allied nationality or refugees from enemy countries, were being investigated as speedily as possible. None had yet been registered.

Mr. SORENSEN asked why Spanish refugee doctors were not given the same opportunity as other refugee doctors to practise temporarily in the United Kingdom. Mr. BROWN said that the object of the Order was to facilitate enrolment of suitable foreign doctors in such services as the Armed Forces of their own countries at present in the United Kingdom, and in the hospital service of this country. He was unaware that these Services would benefit by addition to the list of territories specified in the Order. He offered to consider any information from Mr. Sorensen on the number of Spanish doctors concerned.

Miss RATHBONE said the majority of Spanish doctors in this country were anti-Nazi and anti-Fascist. The services of one of the greatest experts on blood transfusion were being wasted. Mr. BROWN said he knew of some of these doctors whose services were being used in certain ways.

E.M.S. Advisory Committee

On February 20 Mr. ERNEST BROWN (Minister of Health) told Dr. Morgan that the Advisory Emergency Hospital Service Committee consisted of representatives of the Royal Colleges of Physicians, of Surgeons, and of Obstetricians and Gynaecologists, and also of Group Officers, the Central Medical War Committee, the London County Council, the staffs of London voluntary hospitals, and the medical profession in the Provinces, with the secretary and deputy secretary of the Central Medical War Committee. Its function was to advise the Minister of Health on the organization of medical personnel in the Emergency Medical Service. The committee was first appointed in October, 1939, and subsequently enlarged, by the Central Medical War Committee, and was reappointed by that committee in the present month. The members were nominated by the bodies they represented or directly appointed by the Central Medical War Committee. The committee had met on nine occasions at the offices of the Central Medical War Committee.

Doctors Transferred to Reception Areas

Dr. MORGAN asked on February 20 if the Minister of Health knew that disquiet existed by reason of many doctors under 45 years of age being appointed to reception areas at the instance of Local Medical War Committees or the Central Medical War Committee. He asked Mr. Brown to investigate the position having regard to the needs of the Armed Forces for doctors and to the fact that many doctors, either with greater domestic responsibilities or more advanced in years, were available for professional work in reception areas. Mr. BROWN answered that most of the doctors transferred from vulnerable areas to reception areas at the instance of the Central Medical War Committee or its local committees were over 45 years of age. In any case all doctors of military age came up for consideration with a view to selection for service with the Forces. The Central Medical War Committee would be glad to have particulars of doctors available for professional work in reception areas.

Allocation of Medical Man-power

Sir FRANCIS FREMANTLE inquired on February 20 what steps the Minister of Health proposed to take to decide the respective priority of needs of medical practitioners between those of the civil population, of local authorities, and of the fighting Services. Mr. E. BROWN said these questions of priority had already been considered by the Committee on the Allocation of Medical Man-power. Action was being taken on their recommendations. He was considering with the other Ministers concerned what organization should be set up to deal with similar questions that might arise in future.

On February 25 Mr. BROWN told Sir Francis that he hoped shortly to publish the conclusions of the Committee.

The Services

NAVAL COMPASSIONATE FUND

At the quarterly meeting of the directors of the Naval Medical Compassionate Fund, held on February 21, Surgeon Vice-Admiral Sir Percival Nicholls, K.C.B., K.H.P., in the chair, the sum of £96 10s. was distributed among the several applicants.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Surgeon Lieutenant-Commander TYRRELL GEORGE EVANS, R.N.V.R. (H.M.S. *Jervis Bay*) is now officially presumed lost. He received his medical education at St. Bartholomew's Hospital, and qualified M.R.C.S., L.R.C.P. in 1919. After filling the posts of resident anaesthetist and senior house-surgeon at St. Bartholomew's Hospital he settled in practice at Beckington, Bath. He was honorary medical officer to the Victoria Hospital, Frome, and medical officer and public vaccinator for the No. 2 District, Frome. In 1919 he was a vice-president of the Abernethian Society, and he had been a member of the British Medical Association since 1924. He leaves a widow.

ROYAL ARMY MEDICAL CORPS

Major ARTHUR JAMES WALTER ALLEN lost his life at sea in December, 1940. He was the youngest son of Mrs. M. Allen and was educated at Edinburgh University, where he graduated M.B., Ch.B. in 1924. He also took the D.R. in 1928. For some years he resided in London and was honorary radiologist to the London Jewish Hospital and later became assistant radiologist to the Western Infirmary, Glasgow. He was a member of the British Medical Association and the British Institute of Radiologists.

Medical News

Major-General H. Willans, C.B.E., D.S.O., *M.C.*, will read a paper on Army welfare before the Royal Society of Arts, John Adam Street, Adelphi, W.C., on Friday, March 7, at 1.45 p.m., with Lord Croft in the chair.

The second Pan-American Congress of Endocrinology will be held at Montevideo on March 5-8 under the presidency of Dr. Juan C. Mussio Fournier.

A private lunch was recently given by the British Medical Association in honour of Surgeon-General Thomas Parran, head of the United States Public Health Service, Dr. J. E. Gordon, who is acting as United States Liaison Officer with the Ministry of Health, and Dr. John R. Mote, who is now acting as Medical Adviser to the American Red Cross Committee in London. Sir Wilson Jameson, Chief Medical Officer to the Ministry of Health, was the other guest, and among those present were the principal Officers and officials of the Association.

On February 21 the Society of Medical Officers of Health gave a luncheon in honour of Surgeon-General Thomas Parran, head of the United States Public Health Service, Dr. F. T. H. Wood, the President, being in the chair. The Lord Mayor of London was also present, and the company assembled included medical officers of health and representatives of local authorities and of the Ministry of Health. Dr. George Buchan, who took the chair after lunch, proposed the health of Dr. Parran in a short and gracious speech, and Dr. Parran replied.

The seventeenth annual report of the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation gives brief details of the twenty-three grants made during the year. In awarding grants the trustees favour researches that are directed towards the solution of problems in medicine and surgery or in branches of science bearing on medicine and surgery. Grants may be used for the purchase of apparatus and supplies needed for special investigations, and for the payment of unusual expenses incident to such research, including technical assistance, but not for providing apparatus or materials ordinarily a part of laboratory equipment. Stipends for the support of investigators are granted only in exceptional circumstances. The maximum size of grants is usually less than $500. Applications for grants to be held during the year 1941-2 must be in the hands of the Executive Committee before April next. Letters asking for aid must set out clearly the qualifications of the investigator, an accurate description of the research, the size of the grant requested, and the specific use of the money to be expended. Applicants should state whether or not they have approached other Foundations for financial aid. It is highly desirable to include letters of recommendation from the directors of the departments in which the work is to be done. Applications should be sent to Dr. Joseph C. Aub, Huntington Memorial Hospital, *695*, Huntington Avenue, Boston, Massachusetts, U.S.A.

Dr. J. A Fraser, deputy medical officer for the West Riding County Council, has been chosen as medical officer for the North Riding of Yorkshire, succeeding Dr. Andrew Davidson, who was recently appointed to the post of chief medical officer to the Scottish Board of Health.

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended February 1, 1941.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	1941 (b)	1941 (c)	1941 (d)	1941 (e)	1940 (Corresponding Week) (a)	1940 (b)	1940 (c)	1940 (d)	1940 (e)
Cerebrospinal fever	331	29	68	4	19	295	24	75	—	—
Deaths ..		5	6				4	3		
Diphtheria	1,119	43	360	20	33	631	25	153	43	44
Deaths ..	33	2	13	1	1	26	—	8	5	1
Dysentery	129	10	19	—	—	47	1	17	—	—
Deaths ..			—		—			—		
Encephalitis lethargica, acute	4	4	1		—	4	—	—	9	—
Deaths ..		1	—		—			3		
Enteric (typhoid and paratyphoid) fever	10	1	1	3	—	13	1	4	—	—
Deaths ..	1	—	1	—	—		—	—	2	1
Erysipelas		29	50	8	5			51	13	5
Deaths ..		1	—							
Infective enteritis or diarrhœa under 2 years		29	1	12	7	1	33	8	8	9
Deaths ..						18	3,625	46	78	—
Measles	17,186	501	206*		1	—	8	—	1	—
Deaths ..	15	2	2							1
Ophthalmia neonatorum	83	2	12		1	1	59	8	18	—
Deaths ..										
Pneumonia, influenzal	1,640	155	47	26	6	2,169	116	179	11	15
Deaths (from influenza)	176	45	26	16	5	353	37	158	5	11
Pneumonia, primary		128	469	16	16		146	823	19	25
Deaths ..				26					32	
Polio-encephalitis, acute	2	2				1	—			
Deaths ..		—								
Poliomyelitis, acute	15	—	3	—	—	10	1	—	—	—
Deaths ..			—				—			
Puerperal fever	1	1	9	2	—	3	3	14	—	—
Deaths ..							1			
Puerperal pyrexia	119	9	8		4	155	13	17		—
Deaths ..										
Relapsing fever										
Deaths ..		—					—			
Scarlet fever	1,245	61	149	44	38	1,107	47	113	46	46
Deaths ..	2	—	2	—	—	1	—	1	—	1
Small-pox										
Deaths ..										
Typhus fever										
Deaths ..										
Whooping-cough	3,711	56	489*		1	23	484	21	8	1	31
Deaths ..	29	1	14			1	6	—	1		1
Deaths (0-1 year)	392	24	90	29	19	470	54	131	32	26
Infant mortality rate (per 1,000 live births) ..										
Deaths (excluding stillbirths)	7,020	1,207	1,606	313	160	8,872	1,476	1,547	330	236
Annual death rate (per 1,000 persons living) ..				21.9	20.8	17.0			29.8	22.0	20.7
Live births	5,147	324	927	360	254	4,773	709	865	351	211
Annual rate per 1,000 persons living				36	23.9	26.9			17.5	23.4	15.5
Stillbirths ..		207	16	36			243	27	46	
Rate per 1,000 total births (including stillborn) ..				37					50	

* Notification in certain administrative areas only.

† Includes Primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

Measles, whooping-cough, and pneumonia (primary and influenzal) are among the commoner, and cerebrospinal fever, dysentery, and poliomyelitis among the less common, infectious diseases which have increased in incidence during the week. Not only are these diseases (pneumonia excepted) more prevalent than during the corresponding week of 1940, but diphtheria and scarlet fever, whose figures declined somewhat since the previous week, are also in excess of the previous year. On the other hand, the present levels of these two diseases are well below those recorded in 1939.

Cerebrospinal Fever

Although the increase in cerebrospinal fever is appreciable it is not nearly so steep as at this period in 1940, and this affords grounds for the hope that an epidemic of the same magnitude may not occur this year. At present forty-seven administrative areas are involved, one more than in the previous week. Although the large centres of population yield the largest number of cases, the disease is fairly prevalent in rural areas, in many of which it is difficult to determine the density of the population at a given time. There were more than 5 cases during the week in the following administrative areas: Lancaster 64; London 29; West Riding of Yorkshire 20; Warwick 15; Chester 14; Glamorgan 14; Surrey 12; Devon, Durham, Gloucester, Northampton, and Southampton 9 each; Salop 8; Derby and Kent 7 each. The notifications for the week ending February 15 numbered 378.

Influenza for Week Ending February 15

In the week ending February 15, 324 deaths were ascribed to influenza in the great towns. The ratio of increase is appreciably less than between the two previous weeks. The age distribution of the deaths continues to be normal: 54% were at ages over 65 and 9% at ages under 25. In the County of London the deaths have decreased from 56 to 50. Hospital admissions in London (influenza, bronchitis, pneumonia) decreased from 811 to 526, and the daily records of the current week show no sign of increase. It is probable that the great towns will show a further increase of deaths, but the generally favourable impression conveyed by last week's figures is confirmed. All danger has not passed; there may be a continuation of the steady, slow rise of 1929, but this becomes increasingly unlikely as the season advances.

Total of Influenza Deaths and Deaths in Age Groups in 126 Great Towns for Week Ending February 15

All Ages	A Under 1 year	B 1-5	C 5-15	D 15-25	E 25-35	F 35-45	G 45-55	H 55-65	I 65-75	J 75 and over
324	8	8	5	8	11	20	46	45	78	97

Regional Totals for Week Ending February 15

South-Eastern Area:			Midland Area	50
Greater London ..	156	= 176	Eastern Area	5
Rest of S.E. ..	20	101	South-Western Area ..	9
Northern Area			Wales and Monmouthshire ..	17

Total for 126 Great Towns, including the Outer Ring 354

Trichiniasis

Under Section 17 of the Food and Drugs Act, 1938, practitioners are obliged to notify cases of food poisoning, but as there is no definition of the term "food poisoning" it is not clear whether trichiniasis is a notifiable disease. Until this matter is settled it is hoped that practitioners will help the public health services by informing their medical officers of health of any cases or suspicious cases of trichiniasis which come to their notice.

Registrar-General's Quarterly Return

In the quarter ended June 29, 1940, there were 166,537 live births registered in England and Wales: 85,592 were males and 80,945 were females, equivalent to an annual birth rate of 16.2 per 1,000 population, compared with an average of 15.8 in the second quarter of the five preceding years. During the same period there were 118,055 deaths (60,260 males and 57,795 females), giving an annual rate of 11.8, or 0.1 in excess of the average for the preceding five years. Infant mortality was 46 per 1,000 live births, 9 below the average of the ten preceding second quarters.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Prevention of Herpes Labialis

Dr. D. OCKMAN (Kearsley) writes: I note with interest the letter from Dr. R. F. Price (February 15, p. 262) in which he recommends that herpes labialis be "aborted" by spt. vin. rect. I wonder, however, if herpes labialis *should* be aborted. I regard this condition as the manifestation of some form of neuro-cutaneous detoxication mechanism, rather like a boil, and think that to "send it back" is opposing the natural biological mechanism. One might as well seek to abort the excretion of sweat! Is the constant plastering of such skin conditions as psoriasis, pityriasis, etc., with different ointments similarly ill advised? Insufficient attention is paid to the important excretory function of the skin. The prevention of disease must surely come from the prevention of the basic aetiological factors rather than from the attempts to obliterate the natural end-results of natural mechanisms. The opinions of some of your readers on this subject would be of great interest to me.

"C. E. G." (Furze Croft, Hove) suggests to "H. A." (February 1, p. 182) that the cause of herpes labialis should be sought in the condition of the teeth and pharynx.

Treatment of Psoriasis

Dr. P. W. A. AGNEW (Enfield) writes in reply to "S. A." (February 15, p. 262): I have had excellent results in treating a case of severe psoriasis, involving both legs, elbows, and scalp, with the use of the ultra-violet mercury vapour lamp. The treatment has extended over a period of twelve months, twice weekly, with increased time and shortened distance at each exposure. The patient has reached the nearest point to a complete recovery that I have seen with this disease.

Double Meningeal Infection

Dr. FRANK BODMAN (Bristol) writes: The case of double meningeal infection reported by Drs. K. J. Guthrie and T. Anderson (February 8, p. 193) presents some intriguing features. The chief puzzle is, Where did the Gaertner's bacillus come from? The authors claim that they have excluded the food supply, the nursing staff, other patients in the ward, and members of the child's family. This leaves only the child itself. Now this combination of infections has occurred before; as the authors point out, a relapse of meningococcal meningitis turned out to be a Salmonella meningitis in one case, and in another case a meningococcus was found in the blood stream one day and the next day a blood culture showed *Bact. suipestifer*. Perhaps I have read too many detective novels, but is not a possible solution of the mystery the criminal in disguise? Is it too much of a bacteriological heresy to suggest that the meningococcus mutated to *Bact. enteritidis*? That perhaps each type of meningococcus has its *alter ego* in the Salmonella group? How much influence has sulphonamide therapy on the metabolism of the meningococcus? Might the coccus be more likely to survive if it could mutate into bacterial form? It must be obvious that I am not a bacteriologist, but I should like to hear their opinions.

Diphtheria Incidence

Dr. W. P. MELDRUM (Bedford) writes: I think the explanation Dr. R. M. Courtauld (February 8, p. 226) requires is that epidemics of diphtheria, like some other infectious diseases, occur in cycles, and it looks as if an epidemic may be expected. Unless immunization is secured and maintained on a sufficiently large scale epidemics cannot be prevented. That is the experience gained in Canada and the United States. During epidemics there is some demand for immunization, but not sufficient; therefore the prevalence of cases is associated with immunization. On the other hand, when there is no immunization in intervals of absence of diphtheria, there are also, of course, no cases or very few. The fact to remember is that the attack rate, death rate, and fatality rate are much higher among the non-immunized than among the immunized. That is the reason for advocating immunization. If Dr. Courtauld will refer to the *Supplement* of December 21, 1940 (p. 58) he will find some very conclusive figures.

Income Tax

Appointment: Payment of Rent

"M. S." holds a salaried appointment and lives in a house at the hospital, for which he pays a rent of £100 per annum by deduction from his salary. Is he liable on the £100 which he does not receive in cash?

*** Yes. The point was decided in 1933 in the case of Osborn *v.* Swyer.

LETTERS, NOTES, ETC.

Definitely Indefinite

Dr. G. LLEWELLYN DAVIES (Hove) writes apropos of our annotation on the King's English. This no doubt is a stale complaint, but cannot you do something to cure the average doctor of whatever estate, degree, or kind from using the word "definite" or "definitely"? It is high time he was cured or he will soon be getting it mixed up with that other abomination "actually," which occurs three or four times in every sentence uttered by some of our patients. The word "definitely" or "definite" seems to act as a sort of moral prop to so many people when they are really not quite sure. That acute appendix which we suspect and which won't yield the physical signs we expect and which an extra hard "dig" with the finger *appears* to make yield up its secret; that tooth which the dentist is trying to convict or trying to absolve—yes, we are sure there was a *definite* pain or tenderness. If so and one is sure of it, why the redundancy "definite"? It is a matter for congratulation, perhaps, that no one has, so far as is known, been "contacting" any wonderful diseases lately; but that is perhaps among the things to come.

*** "Definitely" has had too long a run in slipshod speech as a variant of "yes," replacing its older cousins "absolutely" and "quite." Dr. Llewellyn Davies rightly protests against the use by medical men of "definite" when they mean "indefinite."

The Late Sir Pendrill Varrier-Jones

Mr. W. A. SIBLY, M.A., Headmaster of Wycliffe College, writes with reference to the obituary notice of Sir Pendrill Varrier-Jones (February 8, p. 220): In Sir Humphry Rolleston's account it is stated that Sir Pendrill was educated at Epsom College and at St. John's College, Cambridge. As a matter of fact he went to Epsom College as a very small boy and came to Wycliffe College when he was 14 years of age, and remained at Wycliffe until he was 19. It was from Wycliffe that he went to St. John's College, Cambridge. So much did he appreciate his Wycliffe connexion that he founded a scholarship, called the Margaret Varrier Scholarship, from Wycliffe to Cambridge some years ago, and at the time of his death he was the president of the school.

Etchings of Westminster Hospital

Mr. IAIN M. MACLEAN, editor of *The Broad Way*, writes from Westminster Hospital, London, S.W.1: Through the courtesy of your columns I should like to draw the attention of all those who qualified from Westminster Hospital to the following. Many of you, although not contributors to *The Broad Way*, may wish to know that the following series of etchings of the hospital will be published (as a free supplement) in the next four issues of our gazette: the hospital (1) in 1734; (2) in 1834; (3) in 1924; (4) in 1939. The artist is one of our present students, and the etchings are suitable for mounting and framing. The first issue of *The Broad Way* containing one of these etchings will be published soon, and if any old Westminster man would like to make certain of getting all the issues will he please communicate with me.

Tubunic Ampoule Syringes

Discussing the administration of morphine to air-raid casualties, correspondents in the *Journal* have referred to the success they have had with the tubunic ampoule syringe. Roche Products Limited write to say that they are issuing omnopon, 1/2 grain, in this new packing, which is of British design and manufacture.

BRITISH MEDICAL JOURNAL

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PRIMARY THROMBOSIS OF CEREBRAL VEINS (FOLLOWING CHILDBIRTH)

BY

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Using Gowers's (1892–3) classification, thrombosis of a cerebral vein is "primary" if it is due to "the state of the blood and circulation generally" and is not consequent upon disease adjacent to the brain or venous sinuses—e.g., in the ears. Evidence is gradually accumulating that primary thrombosis of a vein (or veins) on the surface of the brain is not a very uncommon condition. Few uncomplicated cases have, however, been described in which its occurrence has been established by post-mortem examination or by exploratory operation, and its clinical and pathological features are not at all widely known.

We are able to present three cases which came to necropsy and one in which the thrombosed vein was seen at operation, and to refer to other cases in which the clinical features were so similar to those of the verified cases that there can be little doubt that they had the same pathology. Since we are concerned only with the effects of thrombosis of the veins we shall exclude from consideration cases in which, according to our judgment, the venous obstruction was due to occlusion of a cranial sinus, even if the thrombosis of the sinus was "primary."

Primary thrombosis of cerebral veins happens sometimes in childhood and less often in old age: during the active period of life its most common association seems to be with childbirth, but it occurs also with general and local infective conditions, and sometimes without any such recognizable causal factor. At a recent discussion the two of us referred, independently of each other, to cases arising during the puerperium (Martin, 1939; Sheehan, 1939), and this paper will be made more compact if we limit ourselves here, so far as is possible, to cases arising under such circumstances. The puerperal cases will serve to illustrate the symptoms and pathology of primary cerebral venous thrombosis in general; at the same time they have an importance of their own in that they demonstrate the nature of certain alarming cases usually regarded as due to "late eclampsia" or to cerebral embolism.

Anatomy

According to O'Connell (1934) eight veins, on the average, pass up from the superficial middle cerebral vein (which lies in the Sylvian fissure), and make anastomoses over the frontal and parietal lobes with the superior longitudinal sinus. Veins arising on the surface of the brain join on to them. The positions of four of these veins are relatively constant, one lying in each of the precentral, central (Rolandic), and post-central sulci, and one in the parieto-occipital sulcus. The more posterior members of the group bend forward as they approach the upper border of the hemisphere and enter the sinus obliquely, in a direction which is thus partly contrary to that of the blood flow in it. Each of the larger superior cortical veins as it passes from the lateral (superior) surface of the brain receives a large tributary from the medial surface of the hemisphere.

Case I

Convulsions ten days after delivery; death one and a half days later. Necropsy: thrombosed veins over right prefrontal area.

A 5-para aged 41 admitted to hospital December 9, 1935, had a normal pregnancy and delivery. The puerperium was uneventful for the first nine days with normal lochia and no pyrexia; nine days after delivery she complained of slight headache. The next day she suddenly became unconscious and had a fit followed by a series of fourteen other fits in the course of twenty-four hours. The temperature rose rapidly to 107° F. The cerebrospinal fluid was clear and under normal pressure; the urine contained albumin and blood; the blood pressure was 145/90 mm. Hg. She remained comatose but without any evidence of hemiplegia, and died thirty hours after the onset of the fits.

Necropsy revealed early bronchopneumonia, healed tuberculosis of the mesenteric glands, some old scars of healed pyelonephritis in both kidneys, and old pleural adhesions on the left side. The uterus was healthy, with normal involution. The other organs, apart from the brain, were also healthy.

The brain showed an area of early cortical softening on the outer aspect of the right prefrontal region about 5 cm. in diameter. In the pia arachnoid over this softening there were two or three thrombosed veins and some small areas of haemorrhage. The superior longitudinal sinus was not examined.

In this case the vessels thrombosed were some of the variable veins in the right prefrontal region, and the onset of convulsions probably coincided with the time of their obstruction. Although a softening was produced, no paralysis was observed, and this was evidently because the lesion was well in advance of the motor area of the cerebral cortex.

Case II

Fits from fourth to eighth day after delivery. Right hemiplegia. Death fifteen days after first fits. Necropsy: thrombosed veins over precentral gyrus; "rat-tail" thrombus in superior longitudinal sinus.

A 10-para aged 39 was admitted on September 11, 1937. She had a normal pregnancy and labour. For the first three days of the puerperium she was apparently well, with normal

temperature and pulse and normal lochia. On the fourth day after delivery she had a fit and developed a right-sided hemiplegia. During this day she had several further fits, during which the right arm was rotated outwards, but the right leg remained still; there was no loss of consciousness. On the seventh day after delivery four similar fits occurred, and on the eighth day two fits.

The blood pressure was 155/85 to 165/95 mm. Hg on the fourth day post partum, but thence varied between 135/80 and 120/75. The temperature rose on the seventh and eighth days to 100° F., and afterwards there were occasional temperatures of 99° F. to 99.5° F. The pulse rate was 70 to 80 per minute for the first week of the puerperium, and afterwards ran at 100 to 110. The urine contained a slight amount of albumin and lactose; the blood urea was 32 mg. per 100 c.cm. seven days after delivery. The lochia were always normal.

The hemiplegia remained unaltered, but the patient seemed to be improving until nineteen days post partum, when she developed cyanosis and a sense of oppression in the chest. This was partly relieved by oxygen; but after about twelve hours she became suddenly more distressed, and died rapidly. At the necropsy the immediate cause of death was found to be a true thrombosis of both pulmonary arteries. The thrombus was firm and grey and occupied most of the branches of these arteries; it appeared to be a few days old. There was no evidence of pulmonary embolism or of lung infarcts; the lungs were dry and rather tough. The right ureter showed a pregnancy dilatation of considerable degree but was not inflamed. The right ovarian veins in the pelvis were thrombosed. The uterus was healthy, with normal involution. The other organs, apart from the brain, were normal.

The brain showed an area of reddish softening of the cortex of the upper part of the left hemisphere, centred near the upper end of the precentral gyrus. This was about 5 cm. in diameter at the surface and about 2 cm. deep; it was surrounded by a zone of yellow staining and softening about 1 cm. in thickness. In the pia arachnoid over the softening there were three large veins distended with red thrombus. The superior longitudinal sinus contained a pale thrombus along its whole length back to the torcular Herophili; this was thicker and whiter, and was adherent near the junction of the thrombosed meningeal veins, but did not occlude the lumen of the sinus.

Microscopically the cerebral softening was typical of advanced necrosis, and the surrounding yellow zone was packed with compound granular corpuscles full of lipoid.

In this instance the onset of fits and of right hemiplegia is presumably to be attributed to thrombosis in the veins over the left cerebral hemisphere and the resulting softening. It is not possible to say when the clot in the superior longitudinal sinus developed, and as it did not obstruct the lumen it is doubtful whether it gave rise to any symptoms.

Case III

Weakness of left arm fourteen days after delivery, followed by repeated convulsions. At a later stage, high intracranial pressure. Thrombosed Rolandic vein seen at operation. Eventual excellent recovery.

This woman, aged 32, was admitted to hospital on March 18, 1934, under the care of one of us. Her first baby was born on March 3, and the puerperium was normal except for a rise of temperature to 99° F. on the third day. On March 17 she complained of a slight headache and had some temporary weakness of the left arm. Next morning on waking she had a headache, her left hand was paralysed, and her tongue felt too big for her mouth. (She may have bitten it during a fit in her sleep.) Soon after waking she had a fit, which began with jerking of the left arm and left side of the face. Four similar fits occurred during the morning, and she was then admitted to hospital, and during the next twenty-four hours had seventeen fits. She had complete paralysis of the left hand and gross loss of sense of position in it. The left side of the face was paralysed; there was only slight weakness of the left leg, but the plantar reflex was extensor.

The central nervous system was otherwise normal, and the other systems showed no abnormalities. The cerebrospinal fluid pressure was normal: the fluid contained 1,700 blood cells per c.mm. but was not otherwise abnormal. The fits practically ceased on the second day and the patient made good progress until the sixteenth day. She then had a fit, and another on each of the two succeeding days; these were followed by a rise of intracranial pressure to 240 mm. of fluid, with morning headaches and papilloedema, signs which eventually led to an exploratory operation. At the operation, performed by Mr. Geoffrey Jefferson on the sixty-ninth day of the patient's illness, the dura was found slightly adherent over the fissure of Rolando, and instead of the normal appearance of the vein in the fissure there was a white opaque streak. The motor cortex appeared softened, but stimulation of it produced responses in the contralateral limbs. The patient made further improvement after the operation, and left hospital a month later without disability.

This case shows two phases. There can be little doubt that the alarming symptoms which occurred at the beginning of the illness were due to thrombosis of the right Rolandic vein, which ten weeks afterwards was seen as an opaque streak in the arachnoid. The cerebrospinal fluid contained numerous blood cells, but the pressure of the fluid was normal. The second phase began on the sixteenth day, when the patient had a recurrence of fits, and thereafter signs of raised intracranial pressure appeared. This rise of pressure may be taken as an indication that the absorption of cerebrospinal fluid by way of the Pacchionian bodies and the superior longitudinal sinus had been obstructed, and thus as evidence of occlusion of the sinus, or at any rate of its "upper story," by clot. Hydrocephalus in connexion with thrombosis of the superior longitudinal sinus has been described in cases of various kinds by Bailey and Hass (1937), Frenckner (1934), Symonds (1937), Ellis (1937), and others.

Case IV

Symptoms of thrombosis of cerebral veins seven days and forty-two days after delivery. Death three years later. Necropsy.

About a week after her sixth confinement, when she was 27 years old, this patient, a 7-para aged 30, had a single convulsion. There are, unfortunately, no further details available about her condition at that time and during the next few days. Three weeks later she had a slight thrombosis of the superficial veins of the right leg; this cleared up satisfactorily. Two weeks afterwards (i.e., six weeks post partum) she suddenly developed paresis of the right arm and leg. The right plantar reflex was extensor; the other reflexes and the eyes were normal. The blood pressure was 110/70. Blood examination showed a marked anaemia: R.B.C., 2,540,000; haemoglobin, 20%; W.B.C., 5,000; urea, 49 mg. per 100 c.cm. Wassermann negative. No abnormality was found in any other system. The hemiplegia gradually disappeared during the next month, though subsequently she had occasional attacks of fainting with unconsciousness, but without any convulsions.

This patient died three years later (April 26, 1940) as a result of ante-partum haemorrhage and uterine sepsis in her seventh pregnancy, and a post-mortem examination was made. The brain showed three depressed scars in the cortex, one over the upper part of the left parietal region and one on the upper aspect of each frontal lobe. These scars were all about 2 to 3 cm. in diameter and 1 cm. deep. The overlying pia arachnoid was brown, thick, and moderately adherent. No remaining thrombosis of cerebral veins or sinuses could be distinguished. On section the depressed areas of the brain surface showed only a thin layer of cortex, which was dark in colour; beneath this the white matter was soft and shrunken. Microscopically these portions showed, almost exclusively, loosely formed glia with few remaining nervous elements.

The history and the pathological findings in this case indicate that three separate cortical veins had thrombosed after the sixth delivery. The convulsion seven days after

delivery was presumably related to one of the frontal lesions; the hemiplegia which occurred later was due to thrombosis of a vein over the left parietal cortex. It is of interest that the latter thrombosis was not accompanied by convulsions, and this brings out the important point that convulsions are not an essential element of the symptomatology. In our experience they are usual, but have not been a prominent feature of all the verified cases of primary cerebral venous thrombosis hitherto published. They occurred in Davis's (1933) case and in Money's (1890), but Dowman's (1926) patient merely had slight attacks of a twitching sensation in the right upper eyelid: fits are not mentioned by Irish (1938) in regard to two cases of primary thrombosis in his series (Nos. 1 to 4), but one of the patients had cramp. A presumptive case without fits has recently been described by Symonds (1940).

Another point of interest in this case is the virtual disappearance of the thrombosed veins three years after the event. In the preceding case the affected vein was seen evidently in process of being absorbed; while Bailey and Hass (1937) have described, in the case of an infant, both the formation of new vessels and canalized thrombi in the superior cerebral veins two and a half months after the presumed time of thrombosis.

Previously Reported Cases.—The puerperal cases reported up to 1904 were included in v. Hösslin's collection (1904, 1905). Of other, more recent, cases Dowman's (1926) was confirmed at operation, and ended in complete recovery. Davis's (1933) case was confirmed, both at operation and post mortem. Waggoner's (1928) was complicated by the presence of an angioma. Two uncomplicated cases of primary venous thrombosis occurred among a group of pathological cases described by Irish (1938). None of these cases was puerperal. Cases in children are in a somewhat different category, and we have not taken account of them all. Money's (1890) case was referred to by Gowers (1892–3), and in the more recent literature there are two post-mortem cases in children with heart disease described by Lhermitte and his co-workers (1936).

For the purpose of establishing the pathological nature of these cases we have necessarily made use of those in which the diagnosis was verified. But we do not wish to give the impression that the condition is always a fatal one. On the contrary, the majority of patients make good recovery. We have seen three other puerperal cases, and a number not associated with childbirth, which in their initial clinical features were closely similar to those already described, but ended happily. The following account, though it describes the most severe of the three puerperal cases, may be taken as typical of all of them.

Case V

Cramp and fits ten days after delivery: incomplete left hemiplegia. Good recovery in three weeks

A primipara aged 25 was confined on June 30, 1938. Labour was normal and the puerperium was uneventful until July 10, when she complained of "cramp" in her left hand and a feeling of faintness. During that evening she had three epileptiform fits, with the twitching more pronounced on the left side, and next morning she found that her left arm was weak. On admission to hospital at 12.50 p.m. that day the patient was able to speak but was stuporous: she had obvious weakness of the left side of her face, and did not move her left arm. There was no stiffness of the neck, and nothing abnormal was found on examination of the heart, lungs, and abdomen, or in the ears; her urine, taken by catheter, had a high specific gravity (1036) but was otherwise normal. Her temperature on admission was 100° F. and her pulse rate 108. The temperature was normal by the following morning and remained so until the next day, when three more brief fits occurred involving loss of consciousness; her temperature rose to 100.2° F., but had returned to normal by 10 o'clock next morning. Her blood pressure was 120/80 mm. Hg; the blood Wassermann was negative.

When examined on the sixth day of her illness she was listless and moderately drowsy. She had incomplete left hemiplegia, the face and hand being most affected and the leg much less, but the left plantar reflex was extensor. There was a loss of sense of position in the fingers of the left hand. The cerebrospinal fluid pressure was not measured, but there was no suggestion, either then or later, that it was increased. The patient's condition steadily improved. In a few days she was quite alert mentally, and within a fortnight of her admission her left hand had recovered a great deal of its power and postural sensibility. She was discharged from the hospital on August 9 after a stay of four weeks and a day, and was then using her left hand normally. There was still very slight weakness in the left side of her face, and the tendon jerks on the left side of her body were distinctly greater than those on the right; the left plantar reflex was indefinite.

When seen again three months later she declared herself quite well except for slight attacks of numbness in the left hand.

There can be little doubt that in this case, as in Case III, the right Rolandic vein was involved. It was probably not thrombosed up to its entry into the superior longitudinal sinus, because the absence of paralysis in the left leg indicates that the tributary from the medial surface of the hemisphere was not obstructed: this tributary enters the main vein as it leaves the surface of the brain to cross over in the arachnoid to the sinus. There were no complications, and recovery was made much quicker than in Case III.

When veins over the more posterior parts of the cerebral hemisphere become thrombosed visual disturbances are likely to ensue. In the following instance, which was not associated with childbirth, it is likely that part of the vein which runs up to the parieto-occipital fissure or one of its tributaries was occluded. Word blindness, attributable to disturbance of function in the adjacent angular gyrus, was among the symptoms.

Case VI

Typhoid fever. Epileptiform attacks followed by word blindness and impairment of postural sense in right hand. Good recovery.

A girl aged 18, recovering from typhoid fever, had seven epileptiform attacks one morning and was afterwards stuporous. When seen four days later she showed no loss of power, but recognized objects in the right hand with less confidence than in the left. She was quite unable to read, although her acuity of vision and visual fields seemed normal. Her tendon jerks were brisk and her plantar reflexes flexor. Her condition gradually improved, and in about six weeks she seemed to have completely recovered.

Comments

These cases show the clinical picture of primary cerebral venous thrombosis and its variation according to the position of the vessels involved. Regarding the subject in its larger aspect the main divisions that call for discussion are: (1) the thrombosis; (2) its effect on the brain; and (3) the clinical features to which these jointly give rise.

The Thrombosis

Aetiology.—The special anatomical factors which favour thrombosis in the veins on the surface of the brain were stressed by Gowers (1892–3). We are inclined to attach less importance than he did to their vertical direction, but the slowness of the blood-flow in them and the fact that the blood leaving them enters the longitudinal sinus in a direction contrary to the current are

probably significant. The more general factors which favour the thrombosis are not well known. In an important group of cases primary cerebral venous thrombosis occurs in the puerperium, which is a time at which thrombosis is particularly apt to arise elsewhere in the body. Nearly all the other cases are associated with conditions in which diarrhoea and vomiting is an added element—typhoid fever, ulcerative colitis, gastro-enteritis—but also (as we have seen in another instance) such a mild infection as "gastric influenza" in a vigorous young subject. In the puerperal cases there is certainly no relation to sepsis which can be recognized clinically or at necropsy. Nevertheless, even though the puerperium has apparently been normal up till the onset of a convulsion, the possibility of a symptomless infection cannot be excluded: positive blood cultures are found in a high percentage of normal women for an hour or two after ordinary delivery. Cerebral venous thrombosis is certainly not a result of difficulty at the delivery: in nearly all the cases this has been quite normal.

Formation of the Thrombus

The exact mechanism by which this thrombosis occurs in cerebral veins has not been fully worked out. An analogy may, however, be drawn with the thrombosis sometimes found in femoral or ovarian veins after delivery, in which the probable sequence is as follows: (*a*) A small pale thrombus forms at the junction of a tributary vein with a large vessel. It is attached along a very narrow longitudinal line at the cardiac side of the junction. (*b*) It enlarges until it rather suddenly obstructs the mouth of the tributary vein, which immediately becomes distended by a firm red thrombus made up mainly of packed red corpuscles. (*c*) The primary thrombus also enlarges into the lumen of the main vein, where it forms a grey "slug" on the wall; later this may gradually extend in either direction along the main vein as a long grey thrombus, sometimes with branches down other tributary veins. This secondary thrombus is formed in blood which is still flowing (though probably somewhat sluggishly), and it usually lies free in the lumen.

The conditions which have been found in the cerebral veins correspond with this interpretation. The distension by red thrombus of one or two of the veins in the arachnoid over the hemisphere is the most striking appearance on opening the skull in these cases. The manner of its development may be considered according to the three stages mentioned.

(*a*) In Case II the site of the primary mural thrombus was identified by the grey slug at the junction of the thrombosed arachnoid vein with the superior longitudinal sinus. But it is not clear whether this is the usual site; it seems probable that in other cases the primary thrombosis occurs at a junction of two arachnoid veins some distance from the sinus. (Since our necropsy technique was modified to study this point we have not had a case of this kind.) The sparing of the leg in Cases III and V must be taken as evidence that the tributary vein from the medial surface of the hemisphere was not obstructed, which suggests that the Rolandic vein was not thrombosed up to its point of entry into the sinus. In some cases in the literature (especially that of Davis, 1933) it is expressly stated that the thrombosis of the arachnoid vein did not extend up to the junction with the superior longitudinal sinus, and in these it may be accepted that the primary thrombosis was at the junction of one arachnoid vein with another. On the other hand, it seems that the point of entry of a vein into the sinus is a likely site for the initial thrombosis owing to the partly opposed directions of flow of the joining blood streams, with the consequent formation of an eddy. In a fatal puerperal case described by Symonds (1937) multiple mural thrombi were seen post mortem on the side of the sinus, and Gowers (1892–3) states that a layer of clot is sometimes found on the wall of the sinus.

(*b*) The red thrombus in the arachnoid vein presumably forms suddenly when the vein is blocked. After a few weeks it becomes decolorized and shrinks as in Case III; after a few years it is no longer recognizable, as in Case IV.

(*c*) When the primary thrombus is on the wall of the superior longitudinal sinus, or if it eventually reaches up to it, the secondary grey thrombus may extend, as in Case II, in the blood flowing along the sinus. It is easy to believe that in some cases this may become so large as to produce mechanical obstruction of the sinus, or that it may become adherent in places to the wall of the sinus. Such occurrences may produce further effects—interference with the absorption of cerebrospinal fluid into the superior longitudinal sinus (as indicated by the clinical signs in Case III) or the obstruction of the mouth of other meningeal veins and consequent red thrombosis of these veins. The latter process may have been responsible in our Case IV for the late thrombosis which caused necrosis of the parietal cortex. A possibility which must not be neglected is that certain of the results apparently due to the secondary thrombus may actually be caused by more than one primary thrombus. This is suggested by the multiple mural thrombi in the sinus recorded by Symonds (1937). On the other hand, in our Cases III and IV the time of development of the later symptoms is in accordance with the explanation that these were secondary.

The Cerebral Lesion

Thrombosis of a vein in the retina provides a dramatic illustration of the effects of venous occlusion in a delicate tissue: numerous small haemorrhages are seen where venules draining into the obstructed vein have ruptured. Something similar evidently occurs in the meninges and in the brain. Frequently one of the first effects is the development of small subarachnoid haemorrhages about the size of a postage stamp or smaller (Case I). This has also been described by Davis (1933), Lhermitte, Lereboullet, and Kaplan (1936), and Irish (1938). The amount of blood may be sufficient, as in Case III, to cause easily recognizable blood in the cerebrospinal fluid obtained at lumbar puncture. Haemorrhages of various sizes may also occur within the brain substance as in Symonds's (1937) case, in two cases in children described by Lhermitte and his co-workers (Armand-Delille and others, 1936; Lhermitte and others, 1936), and in Davis's case.

Necrosis of cerebral tissue without haemorrhage seems, however, to be a more common effect. Our fatal cases show that there is a rapid softening of the area of the hemisphere drained by the affected vein. It is an ordinary reddish necrosis affecting cortex and underlying white matter, and in extent varies from 2 to 5 cm. in diameter. In the fatal cases there is no doubt about the complete nature of the necrosis, either to the naked eye or microscopically, but in non-fatal cases it may be less intense, and in Case III the altered cortex was still capable of response to electrical stimulation. After some days it is surrounded by a broad yellow zone of compound granular corpuscles loaded with lipoids. In the healed stage it becomes a shrunken depressed area 1 to 2 cm. in diameter, with the pia arachnoid somewhat thickened and the arachnoid lightly adherent over it; the general build of the atrophied convolutions can be made out, but the microscopical structure consists of little else but glial fibres.

In the operated cases reported in the literature (Dowman, 1926; Davis, 1933) the condition found was non-haemorrhagic, as in Case III.

Clinical Features

In puerperal cases the onset of the acute illness is most commonly between four and twenty days post partum; usually the delivery has been normal and the puerperium quite uneventful up to that time. The first symptom in most cases is the occurrence of one or more fits. If,

however, a detailed history can be obtained it is often found that the first fit was preceded by some symptoms such as headache or intermittent cramp or weakness of a limb. The fits probably coincide with the sudden obstruction of the meningeal vein and the formation of red thrombus in it. They are to be ascribed to cellular disturbances in the area of cortex in which the venous drainage has been abruptly arrested. The exact site of the cortical lesion is not of great moment: fits seem to occur almost as frequently when non-motor cortex is involved as when motor cortex is concerned. In many cases the fits continue over several hours or days; they are most evident in, and sometimes limited to, the part or side first affected. Recurrence of fits after an interval may indicate that the thrombosis is spreading. The incidence of coma in relation to the fits is very variable. Some patients appear to be conscious immediately after the fit. Prolonged coma is of bad prognostic significance.

After the fits the condition depends on the site of the thrombosis. If the lesion is in the frontal or occipital area no paralysis may be observed. But if the motor cortex is involved, as is commonly the case, there is usually complete paralysis of one limb and weakness of the rest of that side of the body. In our experience the arm is generally the part most severely affected.

The cerebrospinal fluid is as a rule normal unless the subarachnoid haemorrhages have been extensive, when a little blood may be present. There may be slight pyrexia, some albuminuria, and mild hypertension, but these conditions usually clear up in the course of a few days. A transient rise of blood uric acid due to the convulsions is also to be expected (Crawford).

When the convulsive stage is over the patient is in no direct danger from the cerebral lesion, though she is still exposed to the risks of spreading thrombosis in the veins or in the superior longitudinal sinus, or of thrombosis of vessels in other parts of the body. In many cases the paralysis has almost completely gone in the course of a few weeks. Evidently, with the re-establishment of venous drainage the parts of the cortex forming the margin of the lesion are capable of recovery, and the residual lesion, although anatomically considerable, as is shown by our Case IV, is not sufficient to cause paralysis. Two factors possibly help to explain why recovery is much better in these cases than in arterial thrombosis or haemorrhage. The first is that the lesion is on the surface of the brain, where a larger lesion is required to produce the same degree of paralysis than if the lesion is, say, in the internal capsule. Secondly, in cases in which haemorrhage occurs the blood is effused under a lower pressure than in cases of arterial bleeding and so causes less disruption of fibres, and greater recovery is consequently possible when the blood is absorbed.

Recovery is not so complete in all instances, and in more than one presumptive case we have seen residual symptoms. There can be little doubt that in all cases gross anatomical lesions of the cortex are left, and the degree of clinical recovery that is usual provides an illustration that a considerable cortical defect can exist with few or no symptoms.

Diagnosis

The signs and symptoms of cerebral venous thrombosis are not pathognomonic, but the syndrome, taken in conjunction with the conditions in which it arises, is fairly clear. The differential diagnosis of the cases which occur in the puerperium ranges over all the conditions which may cause fits or paralysis at that time, whether peculiar to obstetric cases or not, and it is manifestly impossible to discuss it fully here. Many of these cases have in the past been regarded as "late eclampsia"; the existence of this disease is doubtful, and most of the signs and symptoms on which it is diagnosed are seen in cerebral venous thrombosis, as noted above. Other cases have been ascribed to cerebral embolism from thrombi in the pelvic or femoral veins: this presupposes a patent foramen ovale—an assumption that is rarely justified by the anatomical findings. A further cerebral condition involving hemiplegia associated with blindness of one eye which may occur several days after delivery and thus give rise to difficulties of diagnosis has been fully discussed by Wright Thomson (1940).

Treatment

Much of the treatment is on obvious lines. Luminal, 2 or 3 grains by mouth or intravenously, will usually control the convulsions, and afterwards smaller doses should be administered for a week or two, and massage or passive movements should be given to paralysed limbs. Unless other complications supervene the patient will in most cases have made a good recovery in a few weeks. Since there is often evidence of extension of the thrombosis after the first symptoms the administration of heparin should be considered as soon as the condition is recognized. We have, however, had no opportunity of trying it. In the puerperal cases the danger of uterine haemorrhage would seem to be the principal risk entailed in its use, and the possible danger, in all cases, of the liberation of emboli will have to be taken into account.

Summary

The clinical features and the pathology of primary cerebral venous thrombosis are illustrated by a group of six cases.

In two of these cases the diagnosis was established post mortem and in one case at an exploratory operation. A fourth case came to necropsy three years after the onset, and in the other two cases the diagnosis is presumed because of similarity of symptoms and circumstances with those in the verified cases.

In five of these cases the symptoms occurred after childbirth. Such cases have usually been regarded as instances of "late eclampsia" or cerebral embolism.

Primary cerebral venous thrombosis occurs in the puerperium and in conditions of general and local infection—especially in those associated with vomiting or diarrhoea.

As a result of the venous blockage, softening, with in some cases haemorrhage, occurs in the brain and a permanent residual scar is left on the cerebral cortex.

The outstanding clinical features are fits and paralysis. The fits may be local or general, and in occasional cases may be absent. Premonitory symptoms occur in many cases. A small amount of blood may be found in the cerebrospinal fluid. The relation of these symptoms to the pathological features is briefly discussed.

It is suggested that when the condition is recognized heparin might be tried with a view to preventing spread of the thrombosis.

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THE RECRUIT'S HEART

BY

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The following analysis is presented to call attention to the types of problem met with in the grading of abnormal conditions of the cardiovascular system. The series includes 130 cases referred from recruitment medical boards. Most of them were sent on account of murmurs, a few on account of tachycardia or abnormal rhythms, and a few because of a rheumatic history associated with minor abnormalities of the heart sounds or rhythm. The instructions for grading these cases are laid down, and are in the possession of the chairmen of the medical boards. Reference to some of these instructions was made in the *Journal* of August 10, 1940 (p. 201), under the title of "Effort Syndrome," giving the results of Lord Horder's Committee's recommendations to the Minister of Labour on the examination of the cardiovascular system. These instructions are a valuable guide to the medical boards, and the following series of cases has been considered with special reference to the instructions to see how far the individual case is cared for by the details given.

It is presumed that most of the cases included here presented some doubtful point in diagnosis or assessment of the grading. The frank cases of valvular disease, hypertension, and grosser cardiac irregularities would no doubt have been diagnosed and classified without any difficulty. It is therefore of some interest to observe which of the series required special methods of examination such as radiograph or electrocardiogram before a satisfactory opinion could be given. The cases are perhaps best dealt with under the headings of the diagnosis made, which included: (1) murmurs without organic significance; (2) murmurs indicative of organic disease; (3) hypertension; (4) effort syndrome; (5) abnormal rhythms; and (6) cardiovascular degeneration.

Murmurs without Organic Significance

Lord Horder's Committee makes the following recommendations on systolic murmurs:

> "A systolic murmur heard at the apex cannot be accepted in itself as evidence of structural disease of the heart, but when it is present a high grade of exercise tolerance should be required and care should be taken to exclude enlargement and mitral or aortic disease. A history of acute rheumatism or of dyspnoea on exertion, or the characters of the murmur, may help in the diagnosis. If the systolic bruit is slight and is the only abnormal sign the man may be accepted as Grade I provided he has good exercise tolerance."

In the present series a systolic murmur without other grossly abnormal signs was found in 36 cases, and these were recommended for full military service. It is of interest to note that in 28 cases the murmur was apical, in 3 basal only, and in 5 apical and basal. Of the apical murmurs 9 were audible in recumbency only. The remainder were heard to a less degree in the erect posture, but in only 1 case was the murmur audible more clearly in the erect position. Some of the murmurs were soft and some roughish in character, but none was really harsh. At the apex the murmur was noted to be soft in 26 cases out of 32. Slight conduction of the apical murmur towards the axilla occurred in 5, but, as it is generally conceded that conduction is merely an expression of the intensity of the murmur, this was not held to be evidence of organic changes in the mitral valve. *X*-ray screening showed the heart in all cases to be within the physiological limits of shape and size.

It is of course true that little is known of the origin of systolic murmurs, which are usually regarded as harmless, but general experience since the last war has shown that murmurs such as occurred in the present group may persist indefinitely without any further signs of valvular heart disease appearing and without any functional incapacity of the organ.

In connexion with these systolic murmurs it should be added that other slight deviations from the normal were occasionally present and were not considered sufficient to relegate the patient to a lower grade. They included slight forcibility or diffuseness of the cardiac apex beat, which usually settled down towards the end of the examination and was clearly emotional in origin; occasional reduplication of either the mitral first or the pulmonary second sound; extrasystoles; and occasional slight radiological convexity of the pulmonary arc (which was regarded as within physiological bounds) and minor deviations in the electrical axis. The systolic murmurs considered to indicate organic disease are dealt with later.

Murmurs Indicative of Organic Disease

1. Mitral Disease.—Twenty-three cases in all fell into this group. In 9 of these it was possible to diagnose mitral stenosis on clinical grounds by the discovery of the usual diastolic or presystolic murmur. It is only necessary to add that the familiar methods of eliciting these murmurs in doubtful cases once again proved their usefulness—namely, that the murmur was often audible only in recumbency, especially with the patient lying partially on the left side, and in all cases the murmur was much more evident after exercise. Many of these cases presented no cardiac symptoms, and the patient was capable of good physical effort, in two instances of work as dock labourers. The remaining cases in which the murmur was systolic present the greatest difficulty, and it is sometimes impossible to give a dogmatic opinion as to the suitability of the recruit for military service. None the less, in some the murmur, though systolic in tone, was combined with adverse features sufficient to suggest that the individual would not be fit for full military service. The following case illustrates this point:

> "Rheumatism in 1927. Cardiac impulse forcible but not diffuse. Apical systolic murmur persistent and conducted slightly. Slight impurity of the aortic second sound but no definite aortic diastolic murmur. Radiograph: Moderate generalized enlargement with rounding of the left ventricle, some dilatation of the aorta, and definite right auricular enlargement."

Another case, on the other hand, left some doubt as to whether the mitral valve was actually affected, but the combination of a conducted systolic murmur with forcibility of the cardiac apex beat and a fairly recent history of serious internal haemorrhage made it desirable to put the patient in a low grade more on general principles than from conviction of the organic nature of the valvular murmur.

In all, 15 patients in whom the presenting abnormality was a systolic murmur were recommended for lower grading. In a few of these it was thought that Grade II might be suitable, as, for example, in a man with a history of repeated rheumatism and a systolic murmur who had a good exercise-tolerance test and a normal radiograph and electrocardiogram. Similarly, in 2 cases with systolic murmur the radiograph showed slight prominence of the pulmonary arc. Such cases left a little doubt as to whether they were really suitable for Grade I, although it was thought probable that there was no organic heart

disease. Similar doubt existed with regard to another 2 cases in which the systolic murmur was accompanied by rather more arteriosclerosis than one would have expected in a young man. Still lower grading was recommended when the systolic murmur was associated with well-defined cardiac enlargement, especially right auricular enlargement or pronounced prominence of the pulmonary arc as detected radiologically. In some cases the systolic murmur was accompanied by a history of rheumatism and other suspicious signs—e.g., systolic shock, a doubtful diastolic murmur, or pronounced right ventricular preponderance. Several cases were recommended for low grading on account of systolic murmurs and an associated condition such as bronchitis, emphysema, or doubtful hyperthyroidism. In only 1 case was the electrocardiogram the deciding factor. In this the systolic murmur without other physical signs was associated with prolongation of the P-R interval.

2. *Aortic Disease.*—Five cases of aortic regurgitation were found in the series. In 2 others aortic and mitral disease were combined. In all these cases compensation was perfect, and in several *the men were doing* very laborious work. In 1 case aortic stenosis was associated with the regurgitation. Radiological and electrocardiographic changes were found to support the clinical diagnosis, though they were scarcely necessary.

3. *Congenital Heart Disease.*—Six cases were detected—2 with patent ductus arteriosus and 4 with septal defects. They were easily determined on the typical murmurs, though characteristic radiological changes were often present. Two of the patients were capable of good physical effort, but the others were either of poor physique and correspondingly incapable of such exertion or had been warned since childhood not to take strenuous exercise.

From the point of view of grouping, cases of proved organic valvular disease or congenital heart disease must be regarded as unsuitable for military service if the instructions to the medical boards are carried out precisely. It is of course perfectly true that many of them are capable of heavy physical work, and there is little doubt that a dock labourer with aortic regurgitation would probably be far more capable of standing up to the rigours of military service than a weedy clerk with a mild grade of effort syndrome. There is therefore some reason for the views put forward by Bourne (1940) in advising that certain of these subjects would be fit for military service. In dealing with the problem, however, from the broader point of view of the nation we must take into consideration the fact that there are great chances of an individual with acquired valvular or congenital heart disease deteriorating within the period of his military service. In such an event it would be difficult to prove that the military service, even when of a selected character (if, indeed, such service exists in the Army), might not have been an accelerating factor and so have rendered him a charge on the nation. Further, it is common knowledge that men with valvular lesions, congenital or acquired, showing perfect compensation for many years, may suddenly and unexpectedly break down with the symptoms of congestive heart failure: they are, moreover, always potential subjects for infective endocarditis.

Hypertension

Seven cases were found in which the principal feature was arterial hypertension. In 6 of these the men had a good cardiac reserve and were capable of playing games. Even in a case in which there was a pressure of 250/110 and accompanying cardiac enlargement and arteriosclerosis the patient played football. When the rise of blood pressure was pronounced or was accompanied by radiological changes or considerable arteriosclerosis the patient was recommended for low grading, but when the rise of blood pressure was moderate—e.g., up to 170 systolic—and there was no rise in diastolic pressure or other evidence of cardiovascular degeneration, further readings were recommended before final grading.

Effort Syndrome

After systolic murmurs this group of cases presents the greatest difficulties. No doubt the obvious cases with constitutional evidence of poor physique, nervousness, tremors, blue hands, and so forth were dealt with by the medical boards, so that the cases referred to here were of the borderline type. In none of the 17 cases classified as effort syndrome were there any pronounced symptoms, and the patients were referred chiefly on account of murmurs or tachycardia, or both.

One of the difficulties is to decide whether cases of tachycardia with little or no impairment of the exercise-tolerance test should be classified as effort syndrome. The line taken was to assume that such minor variations from the normal were due to apprehension at the medical examination, and, providing the patient gave a history of good capacity for physical exertion and presented no other abnormal features, he was recommended either for Grade I, or for Grade II during a period of initial training with the expectation that he might be raised later to Grade I.

All the 9 cases recommended for lower grading were engaged in clerical or similar light work, all showed a poor exercise-tolerance test, and most had systolic murmurs at the apex. Even these cases were not recommended for permanent low grading, but for training with the object of determining their ultimate capacity for physical work and the strain of military life.

Abnormal Rhythms

Two cases were found which gave a clinical history diagnostic of paroxysmal tachycardia—namely, an abrupt onset and offset of tachycardia lasting some minutes to an hour or two. They presented no other signs of organic cardiovascular disease, and the cardiac compensation was good. Nevertheless it was felt that such cases would be so uncertain in military life as to make these subjects unsuitable as soldiers.

In another 8 cases recommended for full service clinical and electrocardiographic measures showed the arrhythmia to be of a harmless variety—chiefly extrasystoles—though in 1 case the pronounced sinus arrhythmia with bradycardia raised a suspicion of heart-block, which was disproved by the electrocardiogram. One case showed a typical pulsus bigeminus confirmed by electrocardiogram as a ventricular extrasystole after each normal beat. In every other way the cardiovascular system was intact, and it was felt that this rhythm was physiological for the individual and should be no bar to full military service.

Cardiovascular Degeneration

A few cases were found in which, for the man's age, there was undue arteriosclerosis, sometimes with slight radiological changes or left axis deviation. For the most part these men were recommended for slightly lower grading, but it was felt that any further changes in the cardiovascular system would be so gradual as scarcely to be modified by a reasonable period of military service.

Finally, it should be mentioned that there were a few cases with disabilities, non-cardiac in origin, but perhaps accompanied by some minor changes in the cardiovascular system—for example, 1 case of doubtful hyperthyroidism, 1 of diaphragmatic eventration, and several of bronchitis with emphysema.

Summary

A brief analysis is presented of 130 recruits referred by Ministry of Labour medical boards for special examination of the cardiovascular system. The difficulties of the systolic murmur and borderline effort syndrome cases are considered, and attention is drawn to occasional radiological and electrocardiographical changes leading to lower grading in patients in whom the clinical signs were equivocal. I have indicated some of my views on grading, but am well aware that in many of the problems presented there is no room for dogmatism. Further, the actual grading is finally a matter not for the consultant but for the medical board.

I am very much indebted to my secretary, Miss K. Wolfenden, for her help in the preparation of this paper.

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ALLERGIC ECZEMA AND CATARACT

BY

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The eyes are not uncommonly involved in diseases of the skin. The lids, conjunctiva, and cornea may all become affected. Sometimes the ocular disturbance is slight—for example, a mild blepharo-conjunctivitis associated with a dry scurfy scalp—but a much more severe reaction may occur, as in the keratitis accompanying facial rosacea. In this disease there is never rosacea keratitis without facial rosacea, and although local applications in both instances are beneficial the important treatment is that of the underlying metabolic cause. If this can be suitably treated both skin and eyes improve very considerably, suggesting a common origin for the two diseases.

That the conjunctiva and superficial layers of the cornea should participate in diseases of the skin is not a matter for surprise. These structures are ectodermal in origin and would be expected to react to like stimuli. The lens is developed from surface ectoderm also, and, although its extreme modification of structure for the functions allotted to it render it a unique organ of the body, it is not illogical to expect it to respond to such stimuli as well. It could only do this, of course, by becoming opaque.

In fact, however, the lens is very rarely affected in skin disease. The majority of reported cases have been in patients suffering from neurodermatitis or sclerodermia. In view of this rarity, I am prompted to report a case of anterior cataract associated—directly, I believe—with allergic eczema.

Case Report

The patient, a man aged 26, has been subject to attacks of allergic eczema for many years. Only in the last five years have the eyelids and eyebrows been affected. Other allergic manifestations have been asthma and colitis. All sorts of treatments have been tried (including *x*-ray applications to the face and elsewhere), and it is interesting to note that autohaemotherapy is the only one which has given any relief. Several courses of calcium have been administered, as he is deficient in it. His father has similar allergic manifestations, but no eczema

I first saw the patient in February, 1940, when he complained that for three months the right vision had been misty. On examination I found that there were fluffy opacities in the right lens, central in position, just beneath the anterior capsule These opacities were accompanied by several vacuoles Vision was 6/18 with slight correction. The left lens, except for two small vacuoles, was clear. Vision in this eye was 6/6 with a slight correction. It must here be recorded that one week later the right lens was unchanged, but the left had progressed to a state exactly resembling the right, and vision in this eye was 6/18 also. I cannot account for this sudden and rapid increase in the left lens opacities: at the end of June there had been no further increase. Operation was not immediately advised, since, binocularly, he was able to carry on his work without much difficulty. After a few weeks, however, he found his vision varying and he was experiencing increasing discomfort while reading. Therefore, on February 28, 1940, the right lens was needled. A curette evacuation was performed the following day and he made an uneventful recovery. Vision is now 6/5 with correction.

It must be pointed out here that the dose of *x* rays which he had was not enough to cause an irradiation cataract. Further, the latent period was too short and, more important still, the actual appearance and position of the cataract were not such as are associated with irradiation, the features of which I have described elsewhere (Milner, 1934).

Literature

Rothmund in 1868 noted the presence of cataract associated with skin disease. Andogsky (1932) invented the term "cataracta dermatogenes" in the case of a young man with bilateral cataract and simultaneous skin eruption. Kurz (1924) reported a case of cataract associated with eczema in a girl aged 21. This patient had been given *x*-ray treatment, and Kurz suggested that the parathyroids may have been injured, the resulting dysfunction being responsible for the cataract. (It is not clear whether in this case there were in fact signs of parathyroid dysfunction.) Davis (1921) published the case of a girl of 15 who had a stellate cataract situated in the anterior layers of the lens and who suffered from eczema. He thought that the common origin of skin and lens correlated the two phenomena.

Daniel (1935), who quotes the above examples, demonstrated three cases. Two were in girls of 17 and the other in a man of 35. All three patients had allergic eczema and anterior cataract. Daniel suggested that the cataract changes were allergic in origin. Alan Woods, referring to Daniel's cases, suggested that in allergy the lens capsule (an ectodermal structure) participates in the general cutaneous allergic reaction and that its permeability might be altered. But, he says, there are objections to this unless it could be proved that the aqueous contains specific allergen. Woods gave it as his opinion that there was not enough evidence to warrant the term "allergic cataract."

Gronbläd (1940), referring to Rothmund's cases, says that they were probably examples of poikilodermia Jakobi, a rare skin disease which may be associated with cataract. Gronbläd also says: "Cataract has been noted in other skin diseases, but only in sclerodermia and prurigo Besnier (neurodermatitis) is not uncommon." Prurigo Besnier is thought to be allergic. Thomson (quoted by Gronbläd) reported a few cases of poikilodermia Jakobi, one of which had ocular changes—myopia and optic atrophy—but no cataract. In a personal communication Thomson tells me he has never seen a case of cataract associated with eczema, although one was reported to him. Kugelberg (quoted by Gronbläd) said that the term "cataracta dermatogenes" is incorrect. The cataract is not a sequel to the cutaneous changes, but is on a par with them—i.e., "cataracta syndermatotica."

The likelihood of an underlying endocrine dysfunction in most of the types of skin disease that we have under review in this paper is stressed in the literature. Parathyroid disturbances are often found. The association of tetany (parathyroid insufficiency) and cataract is well known, and the cataract accompanying skin disease is said by some to be due to parathyroid dysfunction. This is, however, by no means certain.

Von Szily (1940) says: "Lenticular opacities are observed in those skin diseases which are presumably associated with endocrine disorders—i.e., neurodermatitis,

poikilodermia, and Darier's disease. These cataracta syndermatotica may show very variable pictures; sometimes they appear as anterior subcapsular marginal opacities, sometimes as a typical shield-like cataract, or as a uniform yellow star-like opacity in the posterior cortex."

The exact classification of eczema is not definitely settled. Some include in the term "allergic eczema" all the diseases already mentioned—neurodermatitis, poikilodermia, sclerodermia, Darier's disease, etc.: but others differentiate between a local lesion—e.g., prurigo Besnier, which commonly affects the flexures—and allergic eczema, typified as a generalized rash. If this difference be admitted it will be found that very few cases of cataract have been described associated with generalized eczema.

Summary

The lens is developed from surface ectoderm, and yet very rarely is involved in skin diseases.

Cases have been reported of cataract associated with skin disease, usually neurodermatitis.

Generalized allergic eczema is not the same as neurodermatitis, and a case is reported of cataract—beginning at the age of 26—in a man subject to allergic eczema.

Most cataracts reported have similar features and are situated beneath the anterior capsule.

It has been suggested that cataract formation in these cases is due to endocrine dysfunction (probably parathyroid). There does not seem to be enough evidence to support this. It is suggested that the cataract formation is influenced by the fact that both lens and skin have a common origin from surface ectoderm. The skin is sensitized to produce an eczematous rash and the lens capsule is affected in some way. This defect in the lens capsule disturbs its metabolism and allows opacities to form in the lens subjacent to the capsule.

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X-RAY TREATMENT OF INOPERABLE CARCINOMA OF THE RECTUM WITHOUT COLOSTOMY

BY

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The chief characteristics of rectal carcinoma are the early fixation to adjacent organs, the slow rate of growth, and the absence of distant metastases until a late stage in its course has been reached. Hence a very high proportion of its victims are found to be inoperable when first examined, but these have the prospect of relatively long survival, during which their sufferings are due to the local effects of the growth, frequent action of the bowels with a sensation of incomplete evacuation, and the passage of mucus, blood, and gas—symptoms which are more a matter of discomfort and inconvenience than of pain and do not greatly impair the general health. To meet this situation it has become the established practice to relieve the rectum of the necessity of performing its function, by carrying out left inguinal colostomy even though there is no obstruction. I quote from two standard textbooks of surgery published recently:

"Left inguinal colostomy, performed before obstructive symptoms develop, makes the patient's life more tolerable and in many instances causes temporary recession in the activity of the growth. If colostomy is withheld there is a prospect of perhaps eight or nine months of life, but often a life of misery."

"Much relief may be afforded and life prolonged by colostomy, which should not be delayed until there are symptoms of obstruction."

These statements, representative of orthodox surgical teaching, require examination. Does colostomy prolong life? Does it necessarily diminish the patient's misery? Does it retard, even temporarily, the growth of the tumour, and must it be carried out before obstruction occurs?

Does Colostomy prolong Life and lessen Suffering?

The effect on the duration of life has been investigated by Lindahl (1936), who found that among patients who had no other form of treatment the average survival of those with colostomy was 24.5 months and of those without colostomy 19.7 months, these periods dating from the onset of symptoms. Taking into account the operative mortality of 16.8% in non-obstructive cases the value of colostomy in prolonging life appears from these figures to be very doubtful. Moreover, the difference in survival of 4.8 months is largely discounted by the reasonable supposition that cases with colostomy were on the average more advanced than those without and that in some of them colostomy may have been necessary on account of obstruction. Gabriel and Lloyd-Davies (1935), whose figures show an operative mortality of 13.4%, record the survival rates of 238 cases as follows: 50% under one year, 30% under two years, 10% under three years, and 6% over three years, only one patient surviving for more than five years. The average survival is thus about eighteen months.

Does colostomy lessen suffering? Gabriel and Lloyd-Davies state that it diminishes diarrhoea, tenesmus, pain, haemorrhage, and discharge, while improving the general condition. It is true that haemorrhage and mucous discharge may be reduced, but it is equally true that they continue and cause considerable discomfort, while occasionally severe haemorrhage occurs. There is a tendency to represent colostomy life as one of comparative happiness and comfort. No doubt some patients do get on remarkably well under these conditions; but they are comparatively few, and are to be found among the more intelligent members of society and those who can afford the regular attendance of a nurse. However, for the less intelligent and poorer people, especially those living in cramped surroundings, colostomy is anything but a blessing either for the patients themselves or for those who have to live with them. Moreover, the performance of manual work is at least a matter of great difficulty. The contention sometimes advanced that patients actually get to like colostomy is answered by the eagerness of those with a temporary colostomy to have it closed as soon as possible.

Effect of Colostomy on Growth of Tumour

It is said that colostomy retards the growth of the tumour by affording rest to the rectum and by removing the irritation caused by the passage of faeces over the ulcerated surface. The continued functioning of the rectum, it is alleged, increases its blood supply, which favours the growth of the tumour. While it must be accepted that the rate of growth of a tumour is limited by its blood supply, it appears to be well founded that a tumour, through its capacity to form blood vessels and to extract a blood supply from the host, can acquire all the nourishment for its insatiable needs at its growing points. But that the nutrition available for the tumour is appreciably increased by the periodic passage of faeces

over its surface seems to me to be extremely doubtful. Nor is there any evidence for the view that continued functioning of the rectum increases the liability to the escape of metastases to distant parts. By reducing sepsis colostomy is said to delay the formation of adhesions and involvement of the lymphatics. But since the rectum cannot be other than septic, whether functioning or not, it is at least doubtful whether the presence of faeces makes any material difference.

The advantage of resting an organ affected with malignancy is a matter that is often discussed: it is part of the larger question whether a patient with an inoperable growth is better off by living a restricted life of some length or a more active if somewhat shortened existence. In view of the very short prolongation of life afforded by colostomy and the risk of the operation as shown by Lindahl's figures, the loss of a doubtful few months' existence is probably more than compensated by the absence of colostomy. At any rate, this view would probably be taken by the more active members of the community.

When to Perform Colostomy

Finally, must colostomy be carried out when the patient is first seen? Only if it can be established that there is a reasonable fear of obstruction occurring later and that the operation would then be more difficult. This thesis would be very hard to maintain, for the great majority of patients who have no colostomy die of causes other than obstruction, such as secondary growths or septic absorption.

It appears, then, that except in cases of actual obstruction the value of colostomy is very doubtful and that our efforts should be directed to the restoration of rectal function to something approaching the normal. This can be achieved by irradiation by radium or *x* rays. While radium has many successes to its credit it suffers from the rapid diminution of intensity with distance—as much as 20% at 1 cm. depth Colostomy is therefore usually though not always performed. Implantation from above as well as from below would seem to be essential in order to gain access to all parts of the growth without causing damage to neighbouring structures; for we have to deal, as Cuthbert Dukes has pointed out, not with a local growth but with a potentially malignant rectum. Gordon-Watson (1935), while recording the survival of two cases—one for 7¼, the other for 4½ years after radium without colostomy—has shown the limitations of radium, the dangers of its use when secondary sepsis is present and when there is extension beyond the rectum, its tendency to increase pain, and the risk of a fibrous stricture.

X-ray Treatment without Colostomy

In the last five years I have treated inoperable cases by a modification of the technique previously existing. This method I have described elsewhere (Roberts, 1936). It is sufficient to say here that its main feature is the supplementing of the anterior and posterior fields, hitherto used, by two fields on the buttocks and three smaller fields—over, anterior to, and posterior to the anus. By this means the dose delivered to the tumour is greatly increased. Subsequent treatment is given approximately every six months, the amount and interval being determined not by the physical state of the rectum but by its functional behaviour. Thirty-five cases without and 11 with colostomy have been treated in this way. I have thus been able to observe the results of *x*-ray treatment, the value of colostomy, and the effect of colostomy on the response to treatment In attempting, however, to form an accurate estimate I have been considerably handicapped by the difficulty of maintaining an adequate follow-up system under present conditions and by the interruption caused through my absence for several months on military service. Of the 35 patients without colostomy 5 are untraced and several others were traced only to the time when they were no longer able to attend hospital, a difficulty unavoidable in a community which is largely rural. Ten of these patients were in an advanced stage of the disease when referred to me, and survived only a few months. I may say that in the hope that some relief might be given I have refused none, though experience has shown that advanced cases have derived little if any benefit. Of the remaining 20 patients who were followed up and who were in good general health, 6 are still living. Apart from the reasons given above, the average survival time cannot be estimated, since if the living are included this rises to infinity, while if they are excluded the picture presented is erroneously pessimistic. It is not, however, the length of survival but the well-being during survival that matters. All these cases have shown remarkable improvement—in the diminution of the daily motions from seven or eight to one, two, or three a day over a considerable period, in the suppression of blood and mucus, and, in most cases, in the patients' capacity to live almost a normal life. Moreover, since the dosage has not been carried beyond the stage of producing a well-marked erythema there have been no local ill effects. None has suffered from anal stricture and none, so far as I have been able to discover, has subsequently required colostomy. The following cases are worthy of mention.

Case Reports

Case 1.—A compositor aged 54 had three months' history of diarrhoea with slight blood and mucus, six to seven motions being passed daily. Examination revealed a large ulcerated mass in the posterior wall of the rectum. Since treatment blood and mucus have stopped and the bowels are open regularly twice a day. He is doing full work 4 years 6 months since his treatment and 4 years 9 months since the onset of symptoms.

Case 2.—A male old-age pensioner aged 67, working on the land, had one year's history of diarrhoea with blood and mucus, passing several motions a day. On examination there was a large fixed craggy mass surrounding the rectum with a small channel through it. Since treatment he has had three regular motions a day with occasional mucus. He is doing full work 3 years 10 months since treatment and 4 years 10 months since the onset of symptoms.

Case 3.—A carpenter aged 52 had one month's history of diarrhoea with eight motions a day. There was a mass at the recto-sigmoid junction, adherent posteriorly. Since treatment he has passed well-formed motions two or three times daily. He is doing full work 3 years 8 months since treatment and 3 years 9 months since the onset of symptoms.

Case 4.—A mechanic aged 54 had eighteen months' history of diarrhoea with blood and mucus, passing seven or eight motions a day. A large fixed mass was present. Now he has one or two well-formed motions daily and no blood or mucus. He does full work 3 years 9 months since treatment and 5 years 3 months since the onset of symptoms.

X-ray Treatment with Colostomy

In the 11 cases which had colostomy the operation had usually been performed as a matter of routine. One of these patients subsequently had profuse rectal haemorrhage which was stopped by *x*-ray treatment, one developed a prolapse of the colostomy, while nearly all suffered considerable discomfort from the continued discharge of mucus. Although the survival in some cases was long, I am convinced that their state was not improved by colostomy. Nor was their response to *x*-ray treatment improved, but rather the reverse. They may on the average have been slightly more advanced cases than those without colostomy, but I do not think that this difference is sufficient explanation of their failure to respond. The

depressing effect of colostomy has been an important contributory factor, but the chief reason, I think, is the absence of rectal function, which in those without colostomy serves as a valuable guide in the determination of the amount of treatment. Taking a broad view I am convinced that most of these patients would have been happier without colostomy and would probably have lived as long.

Summary of Conclusions

The value of colostomy in non-obstructive cases of inoperable carcinoma of the rectum is doubtful.

Except in advanced cases, *x*-ray treatment provides a method of restoring rectal function to a degree compatible with an active life for a considerable period without resort to colostomy. It has the further advantages of causing the minimum of discomfort and avoiding any operative procedure.

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THE VALUE OF VITAMIN B_1 IN DIPHTHERIA

BY

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In estimating the value of vitamin B_1 in diphtheria it can be argued that the general population does not receive an adequate amount of that vitamin and that the neglected case of diphtheria comes from a poor or careless home. It is possible that an acute illness may reveal a latent deficiency, and this may be accentuated by the nutriment given in diphtheria, especially glucose. The argument is strengthened by the obvious resemblance between the clinical condition produced by the toxin of diphtheria and that by vitamin B_1 deficiency, as both show anorexia, circulatory failure, and polyneuritis.

We have summarized in Table I most of the published cases of diphtheria in which vitamin B_1 has been used.

The Present Series of Cases

As the published results of the various authors are contradictory it was decided to reinvestigate the problem and check our results by controls. The cases chosen suffered from severe or very severe faucial diphtheria. They were given the usual treatment, such as anti-diphtheritic serum, absolute rest, etc.; but the test cases had vitamin B_1 in addition. The dosage was 4.5 mg. subcutem daily, the total varying from 36 mg. up to 162 mg. Both test cases and controls were given the routine hospital diets. It was considered desirable not to modify the vitamin content of these diets, which consisted of:

The Onset Diet.—Milk ʒvj with glucose ʒj at each meal. Water and occasional orange juice between.

The Continuation Diet.—Milk with weak tea, jelly, rice pudding made with milk, crustless bread and butter, small quantity of fresh fruit.

The Recovery Diet.—Breakfast: Egg sandwiches, tea. Lunch: Cocoa made with milk, plain biscuits. Dinner: Potatoes, gravy, mincemeat, sometimes a second vegetable; rice pudding with milk. Tea: Bread, butter, jam, fresh fruit, weak tea. Supper: Hot-pot and rice, cornflakes or porridge, milk.

TABLE I.—*Published Cases of Diphtheria in which Vitamin B_1 has been Used*

Observer	No. of Cases	Type of Case	Result
Neumann (1935)	2	Post-diphtheritic paralysis	Rapid improvement — more marked than ever before observed
Peters and Cunningham (1937)	10	Severe cases of diphtheria	No effect on incidence of paralysis—2 developed paralysis of ciliary and palatal muscles; 2 others showed additional paralysis of pharynx and diaphragm, both dying. Clinical experience confirmed by experiments on guinea-pigs
Knapp (1937)	2	(*a*) Drunkard with severe diphtheritic paralysis of diaphragm (*b*) Paralysis of soft palate and diphtheritic pseudo-tabes in child 3 years old	(*a*) "A rapid improvement at the very last moment" (*b*) It was possible to relieve all symptoms within three days
Bennholdt-Thomsen (1936)	1	Severe pharyngeal diphtheria in child 4 years old, in addition to extensive paralysis of diaphragm and bronchopneumonia	Improvement after first dose; improvement continued afterwards, so that the disparagmatic paralysis disappeared within a few days
Teofazic (1938)	5	Paralysis of diaphragm	2 recovered, the other 3 died
	31	Examples of paralysis of palate	No effect
	24	Malignant diphtheria	Incidence and severity of paralysis much less than usual
	33	Extensive faucial involvement	
Strnad (1938)	5	Toxic diphtheria with severe myocarditis and polyneuritis	Improvement was rapid and dramatic in all cases
Reach (1939)	1	Severe post-diphtheritic pseudo-tabes with cranial nerve paralysis	Immediate improvement in mental and physical activity, which wore off in a few hours. Paralysis progressed, but diminished after 7th injection
Schiaparelli (1939)	?	Animal experiments	Vitamin B_1 was found to have no prophylactic or therapeutic effect on post-diphtheritic paralysis. At the most it could be observed that paralysis set in later in guinea-pigs treated either previously or simultaneously with vitamin B_1 than in control animals
Hansen (1939)	?	?	Hansen expresses opinion that vitamin B_1 has no favourable effect in diphtheria
Feige (1939)	30 cases and 30 controls	Mixed	Average duration of paralysis in children so treated was 29.6 days, whereas in the controls it was 49 days. Two patients on vitamin B_1 and 5 not on it died
Reinhard and Schwartzer (1939)	17	Routine diphtheria	No appreciable improvement in the paralysis followed treatment with aneurin. Their results were supplemented by estimating aneurin content of urine, which fell in those developing post-diphtheritic paralysis
Kiss (1940)	3	Post-diphtheritic paralysis	Clinical recovery began in a few days and proceeded rapidly
Frey (1940)	13	Severe faucial diphtheria with more or less widespread paralysis	Seven died. Frey believes in the specific action of vitamin B_1 on nerve supply to the diaphragm. Some of those fatal cases showed evidence of improvement in diaphragmatic movements before death

The home conditions of the patients were investigated, as it was hoped they would act as an index of the previous intake of vitamin B_1. The cases are summarized in Tables II and III.

TABLE II.—*Test Cases*

Case No.	Sex and Age in Years	Home Conditions	Patient's Condition	Vitamin B_1	Course of Disease	Result
1	F. 6	Very poor	Very severe	40 mg. from 7th day	Very satisfactory	Recovered
2	M. 11	,,	Severe	110 mg. from 9th day	Palatal and pharyngeal paralysis. Right Bell's palsy and paralysis of legs	,,
3	M. 8	Fair	Very severe	80 mg. from 23rd day	Very satisfactory	,,
4	M. 6	Very poor	Severe	60 mg. from 30th day	Fairly satisfactory	,,
5	F. 6	Poor	,,	36 mg. from 15th day	Very satisfactory	,,
6	M. 6	Fairly good	,,	56 mg. from 5th day	Palatal paralysis on 10th day. Pharyngeal paralysis in 5th week	,,
7	M. 4	Good	,,	65 mg. from 26th day	Palatal paralysis 15th day. Gallop rhythm of heart. Pharyngeal paralysis. Diaphragmatic paralysis	Died in iron lung
8	M. 2	Poor	,,	34 mg. from 12th day	Very satisfactory	Recovered
9	M. 9	Fairly good	,,	55 mg. from 48th day	Palatal paralysis on 43rd day. Late heart failure 48th day	,,
10	M. 9	,,	Very severe	52.5 mg. from 16th day	Palatal paralysis 32nd day	,,
11	F. 19	Fair	,,	60 mg. from 8th day	Satisfactory	,,
12	M. 10	Good	,,	60 mg. from 26th day	Palatal paralysis 5th day. Early heart failure 16th day	,,
13	M. 10	Poor	,,	121 mg. from 3rd day	Very satisfactory	,,
14	M. 10	Good	Severe	152 mg. from 8th day	Heart developed a mitral systolic murmur 14th day. No heart failure	,,
15	M. 14	,,	Very severe	126 mg. from 2nd day	Palatal paralysis 22nd day	,,
16	F. 8	Fair	Severe	135 mg. from 9th day	Satisfactory	,,
17	F. 8	Good	,,	100 mg. from 11th day	Very satisfactory	,,
18	F. 13	Poor	,,	140 mg. from 5th day	,,	,,
19	M. 10	,,	,,	162 mg. from 3rd day	,,	,,
20	M. 4½	Fair	,,	45 mg. from 10th day	,,	,,

TABLE III.—*Control Cases*

Case No.	Sex and Age in Years	Home Conditions	Patient's Condition	Course of Disease	Result
1	M. 3	Fairly good	Very severe	Palatal paralysis on 14th day. General condition fair	Recovered
2	M. 7	Good	,,	Palatal and pharyngeal paralysis. Paralysis of neck and legs. Late heart failure	,,
3	M. 6½	Poor	,,	Very satisfactory	,,
4	M. 7	Very poor	Severe	Fairly satisfactory	,,
5	F. 8	Poor	,,	Very satisfactory	,,
6	M. 7	Very poor	,,	Palatal paralysis 22nd day	,,
7	F. 2	Good	,,	Very satisfactory	,,
8	M.	Fairly good	,,	Secondary streptococcal abscess. Satisfactory	,,
9	M. 7	,,	,,	Pulse irregular	,,
10	F. 15	Poor	Very severe	Bradycardia on 25th day	,,
11	M. 16½	Fair	,,	Satisfactory	,,
12	F. 3	Good	,,	Palatal paralysis 12th day. Abortive pharyngeal paralysis 47th day	,,
13	M. 8	Poor	,,	Very satisfactory	,,
14	M. 16	Good	Severe	Satisfactory	,,
15	M. 10	,,	Very severe	Right strabismus 12th day	,,
16	F. 8	Fair	Severe	Satisfactory	,,
17	F. 13	Good	,,	,,	,,
18	F. 8	Poor	,,	,,	,,
19	M. 6	Fair	,,	Very satisfactory	,,
20	M. 5	Poor	,,	Satisfactory	,,

Conclusions

The impression gained from the series was that vitamin B_1 had neither a prophylactic nor a therapeutic effect on diphtheritic paralysis or the cardiovascular complications of diphtheria. The most that could be claimed was that it seemed to give the patients a sense of well-being, plus an improvement in appetite. The sense of well-being was of doubtful value in those who were acutely ill as it tended to encourage restlessness. Vitamin B_1 helped in the convalescent stage.

Summary

Most of the published cases of diphtheria in which vitamin B_1 has been used are given in tabular form.

The action of vitamin B_1 was investigated in 20 diphtheritic cases of our own and the results checked by 20 control cases. The results are presented in tabular form.

Thanks are due to Messrs. Evans Sons Lescher and Webb Ltd. for help and generous supplies of vitamin B_1.

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TREATMENT OF GINGIVITIS WITH ASCORBIC ACID

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At the Dundee Dental Hospital, during ten weeks recently, 18 out of a total of 505 new patients have been found to be suffering from gingivitis: 14 of these have been treated by us with massive doses of ascorbic acid with favourable results; 4 failed to co-operate.

The clinical features in a typical case are as follows. The patient complains of painful and bleeding gums. The bleeding is usually spontaneous, but is worse when the teeth are brushed. In 10 cases there was marked lassitude. On examination the gums are found to be red and congested. The area involved varies, but in most cases it extends from the gum margin upwards or downwards for a distance of 8 to 10 mm. On pressure the gums bleed readily, the blood flowing freely from the gum margin. In 2 cases severe sloughing of the gum was observed. In spite of the varied types of gingivitis described in the textbooks we have taken as our main criterion of this condition the prompt bleeding of the gum on pressure. This sign is of great value, as it provides a ready means of following the reparative process. In no case could the gingivitis be attributed to trauma, calculus, or the administration of drugs. There were no other gross signs of a pre-scorbutic state.

Treatment

No dental treatment, such as scaling or the use of mouth-washes, was undertaken in any of our cases. On admission the patient is given 300 mg. of ascorbic acid, and a sample of urine is collected approximately six hours.

or at the latest twelve hours, after this dose. The urine is tested for ascorbic acid by the dichlorophenol-indophenol indicator (Roche). This method follows the saturation test of Harris and Ray (1935). It readily enables one to determine the ascorbic acid saturation of the patient. The presence of 5 mg. or more of ascorbic acid per 100 ml. of urine is taken to indicate adequate saturation.

The patient returns for inspection the following day, when a further 300 mg. of ascorbic acid is given. The urine passed after this dose is then tested. Even after one such dose a great difference in the gum tissue can be observed. The pain has largely disappeared, and the red and congested area of gum has shrunk to half the original size. The gums still bleed on pressure. During the first and second days of treatment some patients experience a tingling sensation in the gums. This is probably associated with the reparative process. The treatment is continued for a further four days, or for two days longer than the time it takes to increase the amount of ascorbic acid in the urine to a value of 5 mg. per 100 ml. The amount of ascorbic acid found necessary to saturate the patients has varied from 900 to 4,200 mg. The average dose has been 2,000 mg.

In most cases there is no bleeding from the gums on pressure after four days' treatment. The long-standing cases appear to be more refractory. One patient who had suffered from marginal gingivitis for four years required 4,200 mg. before his gums responded satisfactorily. The statement that no bleeding occurs on pressure must be qualified to some extent, however, by remarking that even after the gum has returned to its normal healthy consistency firm pressure will still provoke some bleeding from the interdental papilla between teeth 2 and 3 (lateral incisors and canines). For some unexplained reason this area heals slowly. It may be that this persistent bleeding is associated with lack of a factor that is capable of restoring capillary permeability to normal. Szent-Györgyi claims that the haemorrhagic lesions in scurvy are in part due to absence of vitamin P (hesperidin). Patients have all volunteered the information that they feel much better in general health, and their appearance certainly bears this out. When the patients are fully saturated and their gums are in good condition they are given a maintenance dose of 100 mg. a day. They return for inspection each week.

During the course of treatment by ascorbic acid no dental treatment whatever is given. We did not adopt the customary procedure of scaling or application of mouth-washes, etc., as we wished to confine our observations to the action of ascorbic acid alone. It is interesting to remark that in 7 cases the state of oral hygiene and of the teeth was very bad indeed.

The results would apparently indicate that lack of ascorbic acid is one important factor in the causation of such cases of gingivitis. The large amounts necessary to saturate the patients are very striking. The disappearance of the lesion with continued administration of the vitamin must be more than purely fortuitous. As long ago as 1930 Hanke advocated the use of massive doses of orange juice in the treatment of gingivitis. He recommended one pint of orange juice daily for long periods—up to a year at least. This amount of orange juice contains approximately 300 mg. of ascorbic acid and possibly other compounds. He attributed his excellent results to the presence of vitamin C. Roff and Glazebrook (1940) have also obtained successful results. They state, however, that marginal gingivitis can be cured by better oral hygiene. Other workers who have reported favourable results of ascorbic acid in the treatment of gingivitis are Kramer (1937), Demoulin (1938), and Herlitz (1939).

Summary

Fourteen cases of gingivitis have been treated with massive doses of ascorbic acid without any other dental treatment such as scaling or mouth-washes. 300 mg. of ascorbic acid was given daily until a urine test showed that the patient was saturated with the vitamin. On an average a total of 2,000 mg. was needed. The previously sore and inflamed gums became normal after approximately four days' treatment. The treatment should be followed by a maintenance dose.

We are indebted to Roche Products Ltd. for our supply of ascorbic acid and indicator tablets.

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Clinical Memoranda

Chlorine for Nitric Acid Burns

Burns caused by the strongly corrosive acids, nitric and sulphuric, differ in many ways from heat burns. In the latter the object causing the burn ceases to act when the body is removed from contact, but in chemical burns the destruction of tissue goes on until the corrosive is absorbed, washed out, or neutralized.

Clinically there is a contrast between the types, for the heat burn will show inflammatory reaction within twenty-four hours, while the nitric acid burn may appear unchanged for seven to ten days, giving to the uninitiated a false hope that little damage has been inflicted. During this quiet period the skin in the burnt area retains the deep yellow stain (xanthoproteic reaction) which is formed immediately on contact with strong nitric acid, and it feels leathery, but is neither cold nor the seat of pain. Sensation may be slightly numbed, but neither in finger nor limb, should the burn involve these parts, will there be interference with voluntary movement. At the end of a week, or slightly later, a line of demarcation appears, and necrosis becomes evident, progressing to a slough which separates tediously. Healing is remarkably slow. When extensive areas in the back or hip are burnt, prolonged residence in hospital becomes necessary, and cases have been met with for which nine months of indoor treatment have been required before a succession of skin grafts have brought the patient to the stage of being discharged. In the area of the knee-joint deep necrosis from a nitric acid burn has destroyed the continuity of the peroneal nerve and caused permanent drop-foot. On the cheeks the contraction following the healing of nitric acid burns sometimes gives rise to cicatricial ectropion, calling for plastic surgery.

In view of these facts, which are well known, any treatment which promises to lessen the severity of the corrosive action of nitric acid on the skin is worth recording, and for this reason the following case is reported.

CASE REPORT

A workman was turning an earthenware cock when it sprang from its seating and a quantity of strong acid was splashed with force on to his face. The acid had the following composition: nitric acid, 23.5%; sulphuric acid, 68.8%; water, 7.7%. He immediately immersed his face in the nearby water-butt and continued lavage until he was brought by ambulance to the ward. There the routine treatment of scrubbing the stained areas with methylated spirit and profuse bicarbonate of soda was given. The parts affected were the forehead, almost all of the left cheek, the bridge and left side of the nose, the chin, and scattered areas over the neck. The eyes had been protected by goggles. The intensity of the yellow stain recalled a case ending in cicatricial ectropion. The site of the burn was in both cases similar, as was also the strength of the acid involved. The idea that decolorizing the

stain might serve some purpose was conceived. Ammonia, which is recommended by some, has not in my experience been effective as a decolorizer either on the skin or when applied to material; indeed, the stain of nitric acid is sometimes intensified by the application of ammonia.

Bleaching was thought of and, as a quick method of obtaining harmless chlorine, eusol (Edinburgh University solution) was rapidly made by shaking up eupad with warm water. Swabs of this solution were rubbed on the stained area, decolorization taking place almost immediately. It was surprising how rapidly the stain transferred itself from the tissues to the swab. The friction with eusol was kept up briskly, and was repeated after short pauses until the affected areas assumed a pale lemon colour. A very thin coating of 5% tannic acid solution was then painted on all burnt places by means of a camel-hair brush, and all surfaces were quickly dried by a hot-air drier. During the application of the eusol solution the patient at once voluntarily stated that the smarting and tingling in his burns had gone.

The sequel to treatment was interesting. In less than three weeks the patient returned to work without obvious sign of injury. He had not suffered the slightest discomfort in the face or interference with sleep or appetite from the time of the application of eusol. Two weeks from the date of the accident his doctor had allowed him to visit the barber for a shave.

Xanthoproteic acid is regarded as a perfectly innocuous substance, the colour serving only to mark the extent and intensity of the nitric acid action. It would seem, however, that the rapid removal of this nitro-compound from the skin prevents corrosive destruction of the tissues.

Stevenston, Ayrshire. HARRY M. ROBERTS, L.R.C.P. & S.

A Case of Cow-pox

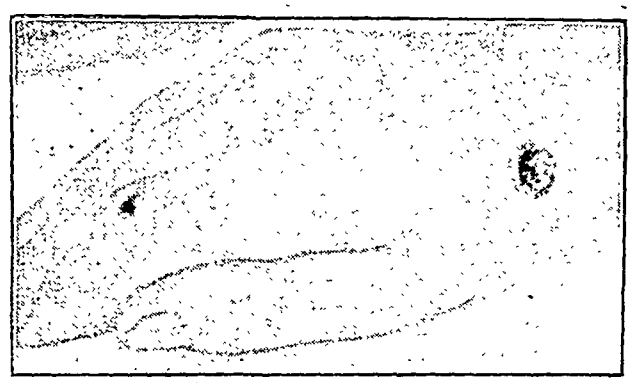
It is difficult to determine why cow-pox is so seldom seen nowadays. Perhaps it is considered a trivial ailment and a doctor is not consulted, or perhaps it is a rare disease and therefore rarely exhibited.

An account of an outbreak which occurred in Somersetshire was published by Dr. R. J. Reece in the *Proceedings of the Royal Society of Medicine* in 1921. He drew attention to the absence of reports of cases in both man and animals for over forty years, and concluded that this was due not to the non-existence of the disease but to the fact that observers believed no useful information could be added to the exhaustive investigations of Robert Ceely, published in 1840. Dr. Reece's article serves as a reminder that cow-pox is not confined to bovines but occurs also in horses and other domesticated animals, and in rats, mice, rabbits, guinea-pigs, hens, and ducks. In these the disease is usually produced by experimental inoculation.

Dr. Reece examined 410 milch cows, at several farms, and found that 214 of them were suspected as having or having had the disease. He had not the opportunity of examining all the milkers employed, but of the 44 he did examine 23 were suffering from or had had cow-pox. Definite figures were not given regarding vaccination, but most of the milkers had been vaccinated in infancy, several had been revaccinated, and some had previously had cow-pox. The sites of infection were usually on the hands, and a photograph published in his paper showed an ulcer at the base of the first metacarpal—a position identical to that shown in the photograph reproduced here. One man had a sore which involved the deep structures of his eyeball and led to a permanent defect in vision. Two lads had ulcers on the eyelids, and one of them had vesicles on the dorsum of the tongue, probably due to licking or sucking a sore on his finger.

REPORT OF A RECENT CASE

A farm labourer aged 17 had two small ulcers on the knuckles of the index and middle fingers of his right hand and a larger ulcer about the size of a sixpence on the back and outer side of the same hand near the wrist (see illustration). This ulcer seemed as if made by a trephine; the edges were clean-cut, a central core was still adherent, and the core was dark and sloughing. There was a profuse thin yellowish discharge with an offensive smell. The surrounding skin was not inflamed. An enlarged tender gland was present in the axilla, but there was no lymphangitis. Very little pain was felt from the sores. There were no lesions on the body. The disease had been present for over a week when he reported, though he knew that he had contracted cow-pox from a cow's



udder. He could not remember having had any cuts or scratches on his hand. He had never been vaccinated.

The ulcers were cleaned by fomentations, and afterwards dressed with acriflavine. The healing period lasted five weeks, during which time the patient ceased milking but carried on with other farm work. He was vaccinated a week after completion of healing, the result being negative.

COMMENT

There was one other milker of the same herd, and he was unaffected. He had been vaccinated in infancy. The herd consisted of twelve cows: seven were milch cows and five fed suckling calves. All the cows had pox on the udders. There was no pox on any of the calves. As the disease is supposed to be carried from cow to cow by a milker it was hard to account for it in those that were not milked. All the cows used the same shed and grazed in the same fields; the infection may therefore have been picked up from the ground. Sometimes the calves obtained drinks of milk from other than the foster-mother and may have infected the latter that way. The original source of infection of the herd could not be traced; there had been no recent addition and no interchange. The cows had not been examined by a veterinary surgeon, but one "vet" had sent an ointment which cured the disease.

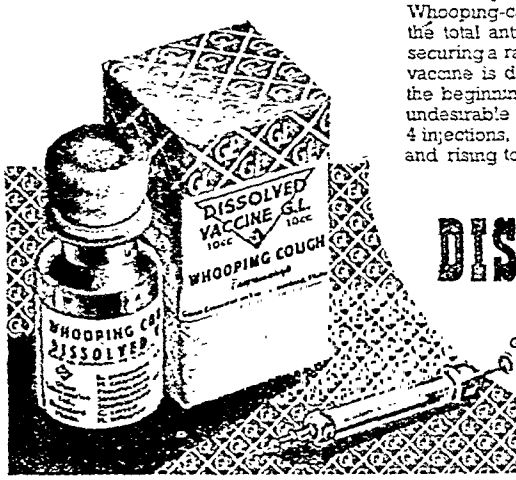
I showed the case to some of my colleagues. Two of them diagnosed correctly; three others were non-committal but concurred when the disease was mentioned. The surprise was that the ailment was not recognized by practitioners with long experience in a rural district. The photograph was taken by Dr. M. C. Cooper.

Polperro, Cornwall. A. MCCLOY, M.B.

The Quarterly Return of Births, Deaths, and Marriages for the thirteen weeks ended June 30, 1940, issued by the Registrar-General, shows an increase in births and marriages in England and Wales. The number of live births was 166,537, an increase of 2,231 over the June quarter of 1939. This is the highest number of births recorded for the June quarter since 1930. Added to the figure of 154,336 births for the first quarter, it makes the total of births for the first half of the year 320,873, which is the highest total for this period since 1931. The birth rate per 1,000 of the population was 16.2. This compares with an average of 15.8 for the second quarters of the five preceding years, and is the highest rate for the June quarter since 1932. There were 48,482 more births registered than deaths. The corresponding increase in the second quarter of 1939 was 43,777. The number of civilian deaths registered in the second quarter of 1940 was 118,055. This was 86,294 below the total for the first three months of the year, and 2,474 fewer than in the corresponding quarter of 1939. The death rate per 1,000 of the population was 11.8, compared with 20.3 for the first quarter of the year and 11.7 for the second quarter of 1939. The report may be obtained from H.M. Stationery Office, York House, Kingsway, W.C.2, price 6d. (by post 8d.).

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Reviews

DISEASES OF PERIPHERAL ARTERIES

The Diagnosis and Treatment of Diseases of the Peripheral Arteries. By Saul S. Samuels, A.M., M.D., Assistant Visiting Surgeon, Bellevue Hospital, New York. Second edition. (Pp. 372. 31s. 6d.) London, New York, Toronto: Oxford University Press. 1940.

The chief feature distinguishing this from the former edition is the greater prominence accorded to arteriosclerosis as a cause of presenile gangrene. A few years ago, when interest in peripheral vascular disease was so greatly stimulated by the writings of Buerger and the endeavours of enterprising surgeons, no one clinician saw enough cases of peripheral vascular disease to enable him to subdivide them into their proper groups—they all seemed to fit the diagnosis of thrombo-angiitis obliterans. Now that special clinics have been established in which peripheral vascular disease may be more thoroughly investigated it is possible to distinguish between Buerger's disease and the rather commoner arteriosclerotic forms of obliterative arteritis. Furthermore, it is now recognized that these diseases, though having a superficial resemblance to one another, actually differ not only in their pathology but also in their clinical manifestations and their response to treatment.

In this book Dr. Samuels brings out many important points in differential diagnosis, but he could have made the matter still clearer had he written a section on diagnosis from which references to aetiology and pathology could have been excluded. As it is, one is left to build up the clinical picture of Buerger's disease from the given facts about its aetiology, and certain features which distinguish it from arteriosclerosis. We would like heartily to endorse the stress laid upon oscillometry as a method of investigation; and, considering how much valuable information regarding prognosis may be obtained by this simple means, it is surprising that clinicians make so little use of it.

In this second edition as in the first, the author declares his faith in the conservative treatment of gangrene of the toes. In his series of 350 cases of thrombo-angiitis obliterans he has had to perform only one major amputation, and even in arteriosclerotic gangrene, though he admits that amputation through the thigh is more often required, he quotes many examples to show the value of conservatism. The control of pain remains the chief problem when non-operative treatment is carried out, and, though Dr. Samuels makes several suggestions with regard to anodynes, the agony so often associated with gangrene of an extremity may become intolerable and necessitate amputation for its relief.

Unfortunately the book does not give a very clear account of the proportion of cases treated successfully by conservative means, the length of time taken for gangrenous digits to separate, and the liability to subsequent recrudescence of gangrene in the stumps left by these spontaneous amputations. Its chief virtue lies in the clear account of the therapeutic measures which may well be employed in all cases of peripheral vascular disease in the hope that they may be successful—cessation of smoking, postural exercises and rest in the horizontal position, antiseptic treatment of the local lesions, and hypertonic venous infusions—and if these methods were conscientiously adopted there is no doubt they would meet with a very gratifying measure of success. The author maintains an attitude of healthy scepticism regarding the value of elaborate physiotherapy and of surgical intervention, and the records given of his personal experience certainly seem to justify this attitude.

HANS ZINSSER

As I Remember Him. The Biography of R. S. By Hans Zinsser. (Pp. 369. 12s. 6d. net.) London: Macmillan and Co., Ltd. 1940.

The recent holder of the chair of bacteriology and immunology at Harvard Medical School, feeling an impulse to edit a biography of one of his medical friends whose attainments and ways of life bore a resemblance to his own, produced the work entitled *As I Remember Him*, throughout which the friend was referred to by the initials R. S. only, but was otherwise unidentified. R. S. was the writer in chief, but his editor frequently inserted passages of his own, so that the book when first published spoke with two voices. On the death, however, of Prof. Zinsser of the Harvard chair the two voices coalesced, for it was then made known that he and R. S. were one and the same person. No very obvious reason emerges for the original mystification.

Hans Zinsser, as he says in his book, was an American of German origin. Having qualified in medicine he endeavoured in the beginning to conduct general practice along with scientific pursuits, but finally, on being appointed to a full-time post in bacteriology, he was able to devote his undivided attention to his chosen specialty. During his career he held office as teacher or research worker in a number of medical schools, but he is perhaps most widely known by reason of his alacrity in speeding to distant lands for the relief of populations stricken by major infections. In the course of these errands of scientific mercy he visited during the last war Serbia and Bulgaria, and later Poland and Russia. More recently, still following where his aspirations led, he found work to do in Tunis, Mexico, China, and Japan. His travels in these so diverse countries are duly described.

In his writing he often arrests and varies the narrative by the discussion of medical and social questions as they happen to arise. He deprecates as a medical evil the too hasty publication of the results of research by workers more avid of notice than careful of the essentials in such matters. Well-informed and appreciative of French and German language and literature, he believes that the adjustment of the humanities to modern conditions is the root requirement of intellectual training. In the troubled world of to-day he sees that scientific progress has outstripped social development. Being himself without a faith he cannot seek to right the wrongs of the time through any ethical code based upon supernatural authority, but he thinks that the present age may witness a new renaissance with the aid of creative art controlled by enlightened criticism. For his own part his guiding light on his way has been professional tradition, and his reward the pride of service.

Although he claims to have been impressed by the "magnificent pageant" of old Greece, he has permitted himself to write: "We sailed down the coast, passing Corfu, where Nausicaa tried unsuccessfully to vamp Ulysses." Such lapses of taste, which occur from time to time in the book, coming from him are less estranging than they might be from another, for we feel in his case that they cannot proceed from any vein of cynicism but rather that they are the welling-up of the irrepressible flippancy of youth which weakens in most men after that age, but which he was able to keep vigorous far into maturity.

Hans Zinsser was a product of his ancestry and upbringing. He combined the philosophic strain with a

practical turn of mind. He held high ideals but had pleasure in living. He did something towards integrating modern science, but also utilized it in practice for the benefit of his fellow men. His book begins with the question, "Why in thunder should anybody want to write a biography of R. S.?" The answer is writ large in the book itself.

NEUROSYPHILIS

Neurosyphilis (Syphilis of the Nervous System). By C. Worster-Drought, M.A., M.D., F.R.C.P. (Pp. 241; illustrated. 10s. 6d. net.) London: John Bale, Sons and Staples. 1940.

Dr. Worster-Drought's book on neurosyphilis provides in compact and handy form the main facts about all aspects of syphilitic infection of the nervous system. After a historical introduction, which begins by giving Columbus the credit for discovering syphilis as well as America, he discusses the aetiology of neurosyphilis, and his book then follows the accustomed arrangement. There are thirty-one illustrations and over 150 references. The author's treatment of the subject is orthodox, though on a few minor points his views might be disputed: for example, that papilloedema in neurosyphilis is always due to a tumour—that is, gumma—and that general paralysis is commonest between the ages of 30 and 40. The book suffers a little from lack of perspective. Thus the reader might suppose that optic neuritis, papilloedema, and optic atrophy were equally common in meningo-vascular syphilis; and a statement of the relative frequency of the different manifestations of neurosyphilis might with advantage be added to the next edition. These, however, are minor points, and the book will be found a reliable guide by students, and by practitioners wishing to specialize in venereal diseases.

OTO-RHINO-LARYNGOLOGY

A Manual of Otology, Rhinology and Laryngology. By Howard Charles Ballenger, M.D., F.A.C.S. (Pp. 302; 90 engravings and 4 coloured plates. 18s. net.) London: Henry Kimpton. 1940.

Ballenger's *Diseases of the Nose, Throat and Ear,* a well-established and valued textbook originally written by the late Dr. Lincoln Ballenger and now in its seventh edition, forms the basis for this much smaller manual, for which Dr. Howard Ballenger sees a need. The gross reduction in size has been chiefly accomplished by the elimination of all details of surgical technique, with which the original textbook is replete. The purpose of the present book is therefore quite different from that of its parent, which is a book for otologists and laryngologists. This small volume is for students and for those physicians who need a general survey of the subject. In this work, therefore, are to be found excellent accounts of the clinical anatomy, pathology, and clinical manifestations of disease in the regions and organs in question, and also some remarks on their treatment. From the purely medical aspect, which has increased rather than diminished in relative importance during recent times, this has been well done in a manner quite in conformity with the character imposed on the book by the author. There are, however, many occasions upon which treatment assumes an overwhelmingly surgical predominance, and to ignore this or dismiss it in a few words is liable to instil a distorted sense of proportion in the uninitiated.

In what he has undertaken the author has succeeded well, and the omission of surgical detail is his own deliberate responsibility, but there are some purely medical topics which, it must be said, leave much to be desired. This is especially the case with the account of paralysis of the larynx, which is not only obscure and inadequate but is illustrated with misleading pictures. Syphilis, too, may be less important now than it once was, but it deserves more than the scanty description accorded to it. On the whole, however, Dr. Ballenger has produced a book in which the student may browse without being overcome by a mass of detail which he has no opportunity to apply.

Notes on Books

The Gallant Little Campeador, by CECIL HUNT (Methuen and Co., 4s.), is a further tribute to the great work of "the little ships" and will have special attraction for medical men because *Campeador's* navigator was retired Surgeon Rear-Admiral J. B. Muir, M.B., F.R.C.S.Ed., who served in her first with the rank of sub-lieutenant and later as lieutenant, R.N.V.R. The youngest of her four officers was aged 58; Muir, the oldest, was 68, and when two were promoted to lieutenant, Mr. Winston Churchill, then First Lord of the Admiralty, endorsed the recommendation, "Promote them, age will be served." When *Campeador* was sunk by striking a mine on June 22 of last year these four very gallant officers perished with her. This is a short and interesting account of some of their adventures, their good comradeship, and their great work. An obituary notice of Surgeon Rear-Admiral Muir appeared in our issue of July 6, 1940.

Sir William Osler, in looking over the literature of malarial fevers one day, chanced to come across some articles by Dr. John Bassett. He was so fascinated by the charm of these philosophical essays that he was led to collect material for a biography well known under the title of *An Alabama Student,* thus rescuing Bassett's name from oblivion. It was therefore thought appropriate to reprint some of the medical reports from his pen between 1840 and 1850, and this has been done in a highly attractive form. Prof. Elkin contributes an introduction, and an appendix consists of a letter written by Dr. Mastin, a pupil of Bassett's, to Osler in 1896, which supplies interesting information which was lacking when the biography was published. The publisher has generously stipulated that certain profits from the sale of this book should be given to the Harvey Cushing Library at Yale. This is altogether fitting, since *An Alabama Student* was Cushing's favourite gift book. *The Medical Reports of John Y. Bassett, M.D.,* is published at $1.50 by Charles C. Thomas of Springfield, Illinois.

The forty-eighth edition of the *Annual Charities Register and Digest* for 1941 has now been published by Longmans, Green and Co. for the Charity Organization Society. This volume of nearly 500 pages gives details of more than 2,700 institutions and societies. The C.O.S. does valuable work in war as in peace, and it deserves the thanks of those who wish to serve their fellows for producing year by year this classified list of hospitals, charities, and public institutions connected with social services. Copies can be had from the C.O.S., Denison House, 296, Vauxhall Bridge Road, London, S.W., or from the publishers (price 8s. 6d.).

Preparations and Appliances

GENTIAN VIOLET JELLY

Gentian violet jelly B.D.H. (Messrs. British Drug Houses) contains 2% gentian violet and 0.02% sodium ethyl mercurithiosalicylate. It is recommended particularly for the treatment of second and third degree burns of the hands and face. It is generally thought that the usual tannic acid treatment has been found unsatisfactory in this particular type of burn. The manufacturers state that their preparation has an analgesic action and that its use results in a granulating surface satisfactory for the purpose of skin grafting. The mercury compound is added to inhibit growth of Gram-negative organisms because gentian violet acts chiefly on Gram-positive forms.

Eli Lilly and Co. market a similar jelly containing 1% gentian violet with 1:5,000 "merthiolate" (which is the name they use for sodium ethyl mercurithiosalicylate).

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HAEMOLYTIC ANAEMIA

Few people have spent their retirement to greater advantage than the late Dr. F. R. B. Atkinson, who was a familiar figure in the library of the Royal Society of Medicine, at his self-imposed task of collecting case reports and bibliographies of rare diseases. The last analysis to come from his pen was one of Lederer's anaemia,[1] and this may profitably be read at the same time as Dameshek and Schwartz's recent review.[2] The acute haemolytic anaemia of Lederer is most common in childhood, but no age is exempt. For no apparent reason the patient becomes markedly pale and exhausted, with profound asthenia, and he may become delirious. The weakness often becomes extreme, with malaise, headache, restlessness and irritability, pain in the back and extremities, fever, and loss of appetite. Gastro-intestinal symptoms are common, and include nausea and vomiting, diarrhoea, pain in the region of the spleen, sensation of weight in the epigastrium, and vague abdominal pain. The rapid onset of anaemia leads to dyspnoea, palpitation of the heart, and oedema of the ankles. The pallor is accompanied by an icteric tinge of the skin or even frank jaundice, but the patient is usually more pale than jaundiced. Haemoglobinuria is present in the fulminating cases, which occur more commonly in infancy. Haemic murmurs can often be heard, the spleen may be palpable, and there may be retinal haemorrhages. Examination of the blood shows a severe anaemia, usually of high colour index, with leucocytosis, reticulocytosis, and the presence of nucleated red cells in the circulating blood. If the condition is untreated the outlook is grave, but if the patient is given one or more transfusions recovery can usually be expected within a few days or weeks.

Dameshek and Schwartz have paid particular attention to the earlier literature, and they show that acute (Lederer) and subacute cases of haemolytic anaemia form a continuous series with the chronic forms of acquired haemolytic anaemia (Banti's haemolytic splenomegaly). This gradation is important, because it suggests that patients with acute and subacute haemolytic anaemias who do not respond to transfusion should be submitted to splenectomy, which in their experience has proved very successful. They have also rediscovered the presence of abnormal haemolysins in the serum of patients with acute haemolytic anaemia, and have demonstrated that the haemolysins disappear after splenectomy, though it must be confessed that the nature of these haemolysins remains very obscure. They have nevertheless presented an interesting schema of the pathological physiology of the haemolytic anaemias. A high concentration of haemolysin leads to fulminating destruction of the red cells, with haemoglobinaemia and haemoglobinuria. Less rapid destruction will be accompanied by bilirubinaemia, spherocytosis, increased fragility, and reticulocytosis. At still lower levels of haemolysin destruction may be balanced by regeneration, and the only detectable abnormality may be a raised level of bilirubin in the serum. This conception is supported by evidence that the red cell population in the haemolytic anaemias can be split up into two groups: the reticulocytes freshly delivered from the bone marrow, and the non-reticulocytes which have been in circulation for some time. The non-reticulocytes are practically all microcytes (spherocytes) and contrast sharply with the reticulocytes, which have a wider diameter but a normal shape. From this it is concluded that spherocytosis and increased fragility represent an alteration in the mature red cell brought about by an intravascular haemolytic agent, and that they are evidence of the pre-haemolytic (prolytic) swelling of the red cell.

This explanation of the erythrocyte morphology in haemolytic anaemia is supported by the experiments of Tigertt, Duncan, and Hight,[3] who injected haemolytic serum into dogs. Haemoglobinaemia and anaemia appeared in these animals, in severity according to the amount of serum administered. In the process of cell destruction the erythrocytes became more spherical, and the approach to sphericity was paralleled by a proportionate decrease in the resistance to hypotonic saline. But a good deal more work must be done on the clinical side before the pathology of the acquired haemolytic anaemias can be put on a satisfactory basis. An urgent need is for follow-up studies to show if recovery from Lederer's anaemia occurs without any sequels, or whether it is not sometimes the herald of a more serious blood disorder or the witness of an underlying constitutional defect. Cases which are observed in the future must be carefully studied if they are to add to knowledge. Essential laboratory data are the size and shape of the red cells, the resistance to hypotonic saline, the evidence of intravascular haemolysis, and the presence of haemolysins in the serum. Two recent accounts are worthy of mention. The patient described by Farrar, Burnett, and Steigman[4] had a haemolytic anaemia of two years' duration which was subject to critical exacerbations. There was no evidence of inheritance and the resistance to hypotonic saline was normal. A haemolysin was detected in the serum and evidence was found of a considerable disturbance of liver function. Splenectomy was successfully performed, and the opportunity was used to take a section of the liver, which showed pigmentary degeneration and fatty change. The anaemia rapidly recovered, the haemolysin disappeared, and the function of the liver returned to normal. Lambie's[5] 18-year-old patient presents a more difficult diagnostic problem, as he had had anaemia and jaundice since birth, and the discussion ranges over the whole gamut of orthochromic and hyperchromic anaemias. Congenital acholuric jaundice is ruled out by the negative family history, the normal shape and resistance of the red cells, and the failure of splenectomy. The condition appears to be a leuco-erythroblastic anaemia persisting after infancy, and a striking feature is its association with hyperuricaemia and severe tophaceous gout.

[1] *Brit. J. Child. Dis.*, 1940, 37, 35.
[2] *Medicine*, 1940, 19, 231.
[3] *Amer. J. med. Sci.*, 1940, 200, 173.
[4] *Ibid.*, 164.
[5] *Med. J. Austral.*, 1940, 1, 535.

MEDICINE IN A CHANGING WORLD

The correspondence which followed the publication in the *Journal* of January 18 of Sir John Orr's lecture on "Trends in Nutrition" and the leading article entitled "Medicine in a Changing World" shows, as Sir John points out in a letter in to-day's issue, that at least some readers of the *Journal* believe that the medical profession should make a contribution to planning for the changed world that most of us expect to see after this war is over.

Most of the correspondents were rightly appreciative of Sir John's lecture, and some were highly critical of the leading article. While welcoming criticism, we believe that much of it was based on a misreading of both contributions on a subject which all are agreed is of the highest importance. There was an undercurrent of suggestion that the lecturer and ourselves were in conflict, and that we had called him to task. One correspondent went so far as to suggest that we had been guilty of impertinence, which goes to show that when medical men plant their feet on unfamiliar soil emotion tends to get the better of reason. We do not agree with the correspondent who said that it was the bounden duty of the medical profession to take an active part in political and economic problems, and in this connexion welcome the following statement in Sir John Orr's letter: "The profession would lose its influence if it allowed itself to become the battleground for conflicting political and economic theories. While members of the profession as citizens should be free to hold any political views they think right, the profession as a profession should be apart from, and above, politics. But it should be interested in the promotion of health, and planners should look to it for guidance on the kind of conditions under which the common man would be able to attain his fullest inherited capacity for health and physical fitness. A statement of these conditions based on facts so far as they can be ascertained, would be a scientific, not a political, statement."

This is the crux of the matter, and amplifies the statement made by Dr. A. J. Brock: "I hold that every intelligent doctor is, or should be, a sociologist." Sir John Orr refers also to the "medical charter" which we suggested might be one of the greatest contributions medicine could make to a troubled and war-weary world when the present conflict is finished. There is a body of ascertained knowledge on what is required for proper physical and mental development. There are many gaps to be filled, but enough is known to provide a ground-plan for healthy living. First and foremost comes the important question of nutrition, and the proper feeding of children is a problem which faces the mother from the day her child is born. In a community planned on rational lines such deficiency diseases as rickets and scurvy should be as rare as was disease itself in that enlightened country, Erewhon. The business of the doctor is to lay down, so far as his knowledge allows him, what are the minimum, or better the optimum, food requirements of human beings from birth onwards, and to see that this information is at the disposal of every member of the community. That food is more important in the preservation of health than housing was shown by the late Dr. M'Gonigle at Stockton-on-Tees, but this is by no means to say that housing is not of the first importance. Damp, ill-ventilated buildings which do not provide adequate living room for growing and grown people are a scandal in any country which claims to be civilized. In addition to nutrition and housing there is the vital question of healthy psychological development and conditions in the home, the school, and the workshop. Much of course depends upon the laying of a proper foundation in the home and the school, but upon the maintenance of a healthy environment, both mental and physical, in factories and industrial organizations will depend the true prosperity of this country.

These and a host of other problems need to be sifted out so that the medical profession can give the public a clear statement on what it considers to be the essentials for the healthy life. The task is big enough in itself to discourage medical practitioners from wandering at large about the political and economic field, as some of our readers would have them do. It should be added that we do not criticize the actions of medical men and women who take up politics as a career in the House of Commons; that assembly would be all the better if medical representation on it were increased, and this has been said many times in these columns.

If a charter were indeed drawn up it would be within the competence of those who did the drafting to complete their investigation by estimating the cost of healthy living in pounds, shillings, and pence, as was in fact done by the British Medical Association Nutrition Committee within its limited terms of reference. It would then be for the statesmen and the economists to see that the materials for healthy living were brought within the reach of every man, woman, and child in the country. The task of the medical profession, as we see it, would be to press from a medical platform its recommendations on whatever group of men were in charge of the affairs of the State. As Sir John Orr remarks on another page, "It would give the planners something definite to plan for, and enable them to deal with realities instead of with political and economic theories."

MORTALITY FROM TUBERCULOSIS

The decline in the mortality rate from tuberculosis in the last century in most Western countries tends to overshadow the fact that the disease is still responsible for a large number of deaths each year. Absolutely it is now responsible, as Wolff illustrates with statistics from the U.S.A.,[1] for far fewer deaths than cancer, nephritis, pneumonia, or heart disease. But in making this comparison two points must be borne in mind. First, tuberculosis kills mainly in the prime of life, whereas the mortality from the other diseases is heaviest at a later period. For instance, in the U.S.A. registration area in 1932 two-thirds of the deaths from tuberculosis were of persons between 15 and 50 years old; for the other diseases the figures were: cancer 19%; nephritis 16%; pneumonia 24%; and diseases of the heart 14%. Secondly, tuberculosis is an infectious disease sensitive to the conditions under which a population lives, and likely to increase its striking power materially when those conditions deteriorate. The

[1] *Amer. Rev. Tubere.*, 1940, 42, 1, 214.

involuntary mass experiment of the last war, affecting both belligerent and neutral countries, gave a clear indication of what may well happen in the present one. The association of tuberculosis with poverty has been shown repeatedly. At first sight, however, it appears paradoxical that while the decline in mortality from the disease is greater in the more industrialized countries, and they have now substantially lower mortality rates than the agrarian countries, yet within the same countries it is the industrialized areas that fare worst. The explanation, as Wolff points out, is that in the industrialized countries the standard of living is higher than it is in the agrarian States. On the other hand, within the same country broadly the same standards of living prevail, but the countryman has the advantage of an open-air life, the townsman more frequently the disadvantages of overcrowded and sunless conditions. His detailed examination of statistics in the U.S.A. supports this view. High death rates are generally to be found in the industrial areas, especially those in the north-east. Among the white population mortality rises as density of population rises; yet it is lowest in the most crowded countries of the world. It is not the density itself that matters, Wolff concludes, but the overcrowding, bad housing, and poor nutrition that may be associated with it, which lead to infection with a bacillus that must be regarded as ubiquitous in modern life. Further reductions in the mortality from tuberculosis turn, therefore, upon two factors: improvement in the social and economic conditions of the people, and in the diagnostic and therapeutic measures adopted to find and isolate the open cases which perpetuate the disease.

GALACTOSE TOLERANCE IN JAUNDICE AND THYROTOXICOSIS

Galactose has been used for testing liver function for many years. Introduced by Bauer[1] in 1906, various modifications of the test have culminated in recent methods which estimate blood galactose after oral (Maclagan)[2] or intravenous (King and Aitken)[3] administration of the sugar. This technique appears to be an improvement over the older practice of estimating either urinary galactose or total blood sugar and presents the clinician with a quantitative index of a liver function which is unconnected with the excretion of bile. The advantage of such a procedure in the study of jaundice should require no emphasis, for a glance at the patient is sufficient to indicate abnormal bile formation, and the diagnosis between toxic and obstructive jaundice is more likely to be made by the use of an entirely distinct function. It appears from the two papers referred to that galactose tolerance is usually normal in obstructive jaundice and almost uniformly impaired in toxic jaundice. More work will, however, be needed to establish a useful time limit for the test when employed in this way, for prolonged obstruction must finally affect every function of the liver. A different aspect of galactose metabolism has been raised by recent work on galactose tolerance in hyperthyroidism in which a fairly constant impairment of tolerance has been well demonstrated by the oral technique by Althausen, Lockart, and Soley[4] and by Maclagan and Rundle.[5] While the latter accept the obvious inference of liver damage in this condition and support their hypothesis with much pathological and clinical data, the former ascribe the results entirely to increased intestinal absorption and produce evidence of this in thyroxinized rats. The crucial experiment should consist in a comparison of oral and intravenous methods, but although normal intravenous galactose curves are claimed in patients with hyperthyroidism[4] insufficient details of this work are given, and it is not clear whether the technique adopted would in fact demonstrate hepatic damage; moreover, intravenous tests in thyroxinized rabbits were highly abnormal.[5] The question cannot therefore be regarded as settled, and it may well be that both factors are at work. This obscurity need not necessarily diminish the value of the test in hyperthyroidism, for both sides are agreed on this point. Althausen, Lockart, and Soley are the more enthusiastic and consider the test as reliable in diagnosis as the basal metabolic rate estimation. Maclagan and Rundle are more concerned with prognosis and treatment, but their description of the test as the equivalent of a new physical sign in Graves's disease appears to be justified.

[1] *Wien. med. Wschr.*, 1906, 56, 2537.
[2] *Quart. J. Med.*, 1940, 9, 151.
[3] *Lancet*, 1940, 2, 543.
[4] *Amer. J. med. Sci.*, 1940, 199, 342.
[5] *Quart. J. Med.*, 1940, 9, 215.

REORGANIZATION IN L.C.C. PUBLIC HEALTH DEPARTMENT

The medical officer of health of the London County Council is in future to be responsible for administering the Council's mental health services. This decision, which was reached at the meeting of the Council on March 4, means the discontinuance of the Mental Hospitals Department as a separate unit, and the transfer of its work and staff to the Public Health Department. The report of the committee which brought forward the recommendation to this effect stated that no dissatisfaction with the past administration of the mental health services was implied. The medical officer of health, Dr. W. A. Daley, had been consulted, and while he did not ask that the work should be transferred to his department, he stated that if it was considered to be in the interest of the Council that he should undertake the added responsibility he would, of course, accept it willingly. No question of altering his salary scale or that of his principal officers in consequence of such transfer of work will arise. It is pointed out in the same report that the Council's mental hospitals and other hospitals have many elements and problems in common, and that while hitherto these have been dealt with by mutual consultation between the two services, there would be considerable advantage in placing under one administrative control both the Council's hospitals for the bodily sick and those for the mentally sick. The present system of administration of the Council's mental hospitals, however, differs from that of the other hospitals in that the former have always been under lay administrative central control. It is considered desirable to maintain such lay control as far as possible. This is proposed to be done by placing the main work in a separate branch of the public health department at the head of which will be a layman with the designation "administrative officer, mental health services," who will be responsible only to the medical officer of health. The medical officer of health must be finally responsible in all matters. The transfer will come into effect not later than April 1.

At the same meeting a further reorganization of the public health department of the Council was proposed and agreed to, consequent upon the retirement or impending retirement of the principal medical officers in charge of two of the three medical branches of the department. The three branches are respectively those concerned with general public health, general hospitals, and special hospitals, each with a principal medical officer with a salary of £2,000 rising to £2,500 in two of the

cases and to £2,200 in the other. It has been decided that the general and special hospitals branches shall be amalgamated and placed under the direction of a principal medical officer, for whom the appropriate salary would be £1,800 rising to £2,000. The name of Dr. R. C. Harkness, chief assistant in the general hospitals branch, is proposed for this position. The position of principal medical officer in charge of the general public health branch has been vacant since the promotion of Dr. Daley to the position of medical officer of health in November, 1939. The duties and responsibilities of the position have been reviewed, and it is considered that an appropriate salary would be £1,600 rising to £1,800. The promotion of Dr. A. M. Hewat, a senior medical officer, to fill this position is recommended.

MEDICAL USES OF ARTIFICIAL RADIOACTIVITY

Radioactive elements have been applied in medicine chiefly as "tracers" in biochemical research and as radiation emitters in treatment. Tuve[1] tells the story of the first "tracer" experiment carried out about 1912 by Hevesy, who left a little radioactive lead with his meat on a boarding-house plate one Sunday, and detected radioactive lead in samples from his meals over the next five days. The radioactive isotopes of an element have the same appearance and the same chemical reactions as their stable (non-radioactive) relatives, so that when combined with substances suitable for feeding or injecting into plant or animal they are handled just like the ordinary compound. Thus the metabolism of any element may be followed, both qualitatively and quantitatively, by the emission of beta or gamma rays by the artificially produced radioactive isotope. The biochemist calls such radioactive atoms "labelled" or "tagged" atoms, and Bale[2] gives an example of how by this means, in an investigation of insecticides, 0.01 μg. of arsenic could be measured in an organ dissected from an insect. Unfortunately the radioactive isotopes of carbon, oxygen, and nitrogen have very short half-lives, so that experiments have to be done at high speed, before the emission of beta rays becomes too small for detection. Even so, radioactive carbon, with a half-life of twenty minutes, is being used in the study of photosynthesis. In the normal dog iron is absorbed from the gastro-intestinal tract in negligible amounts when there is no need for it, but in the anaemic animal it is promptly assimilated in large quantities. If the iron is injected the dog is unable to excrete it. "Labelled" iron appears in the red blood corpuscles as early as five hours after feeding, but it is not yet known whether it is already combined as haemoglobin in this short time. It has similarly been shown that the absorption of phosphorus by rachitic rats is not affected by the simultaneous administration of vitamin D, but the amount retained in the metaphyses from seventy-two hours after feeding onwards is greatly increased in the rats having vitamin D. It will be recalled that the positive line test for calcification in the metaphysis also appears three days after treatment is begun. Artificially produced radioactive substances may be used in treatment in place of radium, and may be particularly valuable in studying the effects of different wave-lengths — for example, P^{32} gives pure beta rays, and Na^{24} gamma rays harder than those from radium. But since different elements are often concentrated in different tissues, their radioactive isotopes may be used for the intimate irradiation of such tissues—for example, iodine for the thyroid. Radio-sodium was used in the treatment of leukaemia by Hamilton and Stone,[3] but as it is not specially concentrated by leukaemic tissue, this was equivalent to total-body irradiation by *x* rays. Now that it has been found that, although the total phosphorus content of leukaemic tissue does not differ from the normal, it has a greater uptake and exchange of phosphorus than normal tissues have, a selective irradiation of leukaemic tissue by means of radio-phosphorus becomes possible. Lawrence[4] reports two years' experience of such a method, in which the effects of ingestion of a single dose of radio-phosphorus have been similar to those of a course of *x*-ray therapy. The maximum dose of sodium phosphate has been 3 grammes, containing up to 8 millicuries of radio-phosphorus, which would be equivalent to about 3 *r* daily whole-body irradiation for a fortnight. It is obvious which method of treatment the patient with chronic leukaemia would prefer if he had the choice. Lawrence has also treated two cases of polycythaemia vera with good result, for radio-phosphorus concentrates in bone and bone marrow, so giving selective irradiation. The dosage has so far been small, but from *x*-ray experience it would appear that 100 mc. or more of radio-phosphorus could be tolerated, which would give a sufficient localized intensity of radiation in bone to destroy multiple myelomata or metastatic carcinomatous deposits.

[1] *Radiology*, 1940, 35, 174.
[2] Ibid., 184.

SURGICAL TREATMENT OF INFECTED PATENT DUCTUS ARTERIOSUS

Ligation of the ductus arteriosus when present as an isolated congenital lesion has been successfully carried out, and in 1939 four cases were reported by Gross.[5] None of these was infected, and it was largely with a view to preventing this fatal complication that the operation was proposed and undertaken. At that time it was doubted whether a case already infected would be suitable for surgical treatment, but A. S. W. Touroff and H. Vesell[6] have operated on four such cases, with considerable success in one. The patients were adult women aged 24 to 63, who had been practically symptomless until infection supervened. There had been symptoms of infection, which in every case was by *Streptococcus viridans*, for three weeks to five months before the operation, and chemotherapy had been tried in three of the patients without effect. On exposing the ductus the wall was found to be inflamed and indurated and firmly adherent to surrounding structures; severe haemorrhage resulted, and two of the patients died on the table from this cause. Friability of the ductus and dilatation of the pulmonary artery increase the risk of such a complication. Of the two patients who survived the operation one was quite well nineteen weeks later, having lost all evidence of infection. In the other case, however, in which the ductus was ligated but not excised, the bacteriaemia was only temporarily reduced, and after four months the patient's condition was deteriorating. It was considered probable that in this case there were also vegetations on the aortic valve from the outset. It is clear that operation on the ductus, difficult enough when the ductus is free from infection, becomes doubly so when this complication has arisen. In recording a single good result out of four attempts, even though it may not turn out to be a permanent cure, Touroff and Vesell have achieved a notable success. It appears that in order to deal surgically with a ductus that has become the seat of a subacute endarteritis from *Streptococcus viridans* it should not be too friable or too adherent, there should be

[3] *Radiology*, 1937, 28, 178.
[4] Ibid., 1940, 35, 51.
[5] *Ann. Surg.*, 1939, 110, 321.
[6] *J. thorac. Surg.*, 1940, 10, 59.

little dilatation of the pulmonary artery, and the left heart and aorta should be free of infection. These conditions are most likely to be realized if the treatment is undertaken early. Whether or not surgery can remove all risk of subsequent reinfection or, in the case of a vessel not yet infected, can give permanent protection against it are questions that will have to await an answer for some time.

DISTRICT NURSING IN WARTIME

The Central Council for District Nursing in London, which comprises eighty-three district nursing associations, held its annual meeting at County Hall on February 27. The twenty-sixth annual report which was presented described the past year as a testing time for district nursing, but the organization has stood firmly, although finance is difficult. No nurses' home has been rendered uninhabitable through enemy action, and despite the fact that district nurses have to be constantly about the streets, personnel has been spared to a remarkable degree. Two district nurses, however, met their death in raids. At least twenty nurses have been lent to the London County Council for the staffing of rest centres, and many more have made themselves available for duty in emergency. Some nurses have been lent to first-aid posts, where in the circumstances of the last few months they have proved most valuable, and others have been lent, at least for a short time, as a matter of urgency, to air-raid shelters. Strictly speaking, all this is not domiciliary nursing, but it is in the larger sense closely linked to the normal work of district nursing and may provide an even more important opportunity to influence public welfare both now and in the future. In spite of the continuous movement of the London population the number of patients attended under the scheme for public assistance nursing shows no decrease. Among these were 1,591 cases visited for insulin treatment, the number of visits paid during the year being 123,157. It was reported to the meeting that the King Edward's Hospital Fund had, at the Council's suggestion, issued a circular to hospitals urging greater use of district nursing associations with a view to relieving out-patient departments.

TREATMENT OF PHTHISIS

Dr. Peter Edwards's annual report on the work of the Cheshire Joint Sanatorium for the year ending March 31, 1939, again proves that much better results can be obtained in the treatment of phthisis when, in addition to bed rest and a sanatorium regime, extensive but judicious use is made of collapse therapy. During the year 426 patients were admitted, including 122 T.B. minus and 27 observation cases; 20 stayed less than one month, 87 less than three months. One hundred and ninety-two patients were selected for artificial pneumothorax, 87 for phrenic interruption, and 123 for adhesion-section. Tubercle bacilli were "banished from the sputum" in all of the 5 T.B. + 1 cases, in 67% of the 153 T.B. + 2 cases, and in 34% of the 116 T.B. + 3 cases—no mean feat when it is borne in mind that at this institution culture of the sputum is carried out as a routine when no bacilli are detected in smears. Dr. Edwards is reluctant to attach the label "quiescent" to his patients ("As quiescent is difficult to assess we put few in this class"), so that among the sputum-positive group only one patient was discharged as quiescent, though 98% of the T.B. + 2 and over 40% of the T.B. + 3 group are discharged as improved. The paucity of words with which the work of the sanatorium is presented, the questionable importance of some of the tables given (for example, those connected with body weight), and the introduction of second decimals in percentages relating to small numbers further tend to underemphasize sanatorium results that may be considered exceptional in this country. Particular attention must be drawn to the "statistics of ultimate results" in 4,025 patients discharged over a period of one to fourteen years, of whom only 2.4% have not been traced. The report also contains the findings of a comparison between the Vollmer patch test and the Mantoux test with P.P.D. Contrary to some of the claims made by enthusiasts of the patch test it was found that this test could not be depended on to detect all positive reactors and that it was even not a *desirable substitute* for P.P.D. first strength. This investigation cannot carry full weight unless the authors publish the criteria adopted for a positive reaction in each of the tests.

FRIEDLÄNDER LUNG INFECTIONS

Friedländer's bacillus, although more often encountered in chronic infections of the upper air passages, has long been recognized as an occasional cause of lobar pneumonia. Friedländer pneumonia occurs usually in middle-aged or elderly subjects, produces extensive consolidation in which the upper lobe is often included, and has a very high mortality, usually stated to be 70% or more. It is not so well recognized that such cases as survive an acute attack of this disease may suffer from sequelae caused by necrosis in affected parts of the lung. S. Solomon,[1] who three years ago published a series of cases of Friedländer pneumonia, now describes seventeen further cases in which the patient survived four weeks or longer, an arbitrary period adopted to distinguish the acute from the chronic stage of the infection. All but three of the patients were over 40 years of age, all but five were males, and ten were considered to be alcoholics. Only three recovered completely without residual lung damage. The common sequel is lung abscess, usually situated in the upper lobe and draining freely through the bronchi. Such cases present signs of cavitation, often have a blood-streaked sputum, and are hence liable to be diagnosed as tuberculous. History and sputum examination should serve to distinguish them. The earlier the stage at which the sputum is examined the greater the numbers of Friedländer's bacillus and the more certain their significance; with the lapse of time secondary infection is apt to obscure the picture. Four of Solomon's cases were treated with sulphapyridine and one with sulphanilamide; all survived, but none escaped abscess formation. The case described by Surgeon Lieutenant Fraser Sinclair in the *Journal* of February 8 responded well to sulphapyridine and later developed an empyema. The sulphonamides may therefore have some value in combating the acute stage of the infection, but the effect is neither striking nor complete. The surgical drainage of these lung abscesses is not recommended; drainage through the bronchi is free and can be aided by postural treatment. Ultimate complete recovery appears to occur in a few cases. This is evidently a condition to be borne in mind in the differential diagnosis of cavitation in the upper part of the lung in middle-aged patients; it is liable to be confused not only with tuberculosis but also with lung cancer.

[1] *J. Amer. med. Ass.*, 1940, 115, 1527.

MEDICAL PROBLEMS OF A RECEPTION AREA

BY

R. Y. STONES, O.B.E., *M.C.*, M.D., M.R.C.P., D.P.H.

The crisis of 1938 gave us time to make careful preparation for receiving children from danger zones. When war came and the children arrived these plans automatically came into operation, and billets were ready. All went according to plan except the bombing, and many parents, missing their children, fetched them home again. What had not been anticipated, however, was the frequency of nocturnal enuresis among the children, nor were they as clean as had been expected. Faults concealed by maternal affection were not so readily condoned by foster-parents whose beds had been spoilt and their own children infected by these visitors.

Classifying the Children

When, therefore, a new plan of evacuation was prepared a careful history was obtained and a fuller medical examination made, so that the children might be classified as fit or unfit for billets. This scheme worked well with officially evacuated children, but when the *Blitzkrieg* really started many who had not been put in these categories arrived at the centre. Careful preparations for their arrival had again been made: the children were met at a centre, welcomed by committees and officials, rested after their journey, given milk and biscuits, medically examined once again, and drafted to billets. Rather to our surprise, however, a large number were unfit for billeting.

Unfortunately few places were ready for receiving children who were unfit to be placed in ordinary billets. All empty houses had been acquired by unofficial evacuees, by refugees, or by Government departments moved from vulnerable areas. The sick bay which was to serve the whole area was not ready owing to the scant choice of empty houses. The hostel for unbilletable children was nearly full from the previous evacuations. Though hostels had been provided by different local authorities, these were only prepared to accept special cases of a type chosen by themselves. Hours were spent by the medical officer of health in trying to find suitable accommodation for those with such afflictions as scabies, impetigo, and the bed-wetting habit. Also there were contacts with infectious diseases who could not be sent to ordinary billets. A great number of the children, who had been forced to spend long periods in air-raid shelters without ordinary care and cleanliness being possible, were found to be infested with lice and nits. It was impossible to isolate them, so they were sent to ordinary billets and arrangements were made for the school nurse to attend to them as soon as possible. With regard to the former, in the end it was necessary to call upon the Poor Law institutions to accept them while arrangements for their admission were made elsewhere. Here they were kept for a day or two, and were then sent to the hostels which had meanwhile been instructed to receive them. These hostels, not having been prepared for such cases, soon became dirty or overcrowded. Before long, however, steps were taken to correct these defects, and the hostels are now serving a very useful purpose.

Difficulties Met With

Careful thought had been given by the Ministry of Health to the provision by local authorities of institutions for evacuated persons, and Circulars 1871 and 1882, dealing with the matter, had been prepared. Unfortunately these were only suggestions; it had been left to each local authority to adopt them or not, and few of these bodies desired to add to their wartime burdens. Some shouldered the burden nobly, but others took no advantage of the suggestions of the Ministry. Expense had to be considered, and, though this is recoverable, permission to spend was not easy to obtain.

So now, with a lack of these necessary institutions, it is very difficult to deal with problems as they arise. There is the problem of the family bombed out of their home who arrive in this safe area. Temporary shelter must be found at once, and it is gladly provided in public halls and church rooms. As soon as possible billets are given them. Unhappily there are but few left; therefore it is not unnatural that refugees prefer to remain in the halls, where they are fed and made comfortable, and are loath to search for billets.

In this way small colonies come into being, each with health problems of its own. Sanitary arrangements that are adequate for a meeting hall may not be satisfactory when the hall is used for continued residence: washing arrangements are generally scanty, baths are absent, and there is no means of separating the sexes. Minor infectious ailments which could normally be treated at home cannot here be separated from the rest of the community. No room is available for the observation of children, perhaps sickening for a more serious infectious illness, nor can contacts be isolated. A distinct menace to public health therefore arises from the continued occupation of such premises.

A problem which we have not yet solved is the placing of children who have been treated for skin affections and enuresis at the hostel. Foster-parents are naturally chary of accepting such children, and the stigma is hard to remove. Skin affections should be treated in a hostel for minor infectious illnesses, and bed-wetters should first be sent to the sick bay for observation and treatment. It is found that often a change in the type of, and time for, supper, with restrictions in the amount of fluids taken with the evening meal, is enough to check the habit. These children should then be sent back to their former billets, or to new ones, which have been reserved for them for a stated period. Full written recommendations as to diet, etc., should accompany them. Children suffering from frequent nocturnal enuresis, who are apt to block beds in the bay and must be removed, should be sent not to a home for unbilletable children but to a long-term hostel under the control of the doctor and matron of the sick bay, where treatment would be continued.

As billets become scarcer the householder becomes more discriminating and finds a means of retreat by demurring at some condition of the skin of the intended child guest. An abrasion or a labial herpes which has become the site of a staphylococcal infection is given the dread name of impetigo, and so the child is pronounced unfit for billeting and must be sent to the appropriate hostel receiving such skin cases. Difficulty may be found in later placing it in a billet even when the sore is healed.

Suggested Medical Institutions

In this reception area we now have the following institutions: a home for unbilletable children which is also to be used as a sick bay; a hostel for the admission of measles with complications, chicken-pox, etc. (cases of scabies and impetigo are also admitted); two hostels where bed-wetters and mentally retarded children with dirty habits, scabies, and impetigo are admitted. These are administered by three local authorities. In addition to the county fever hospital, which admits all major infectious diseases, there is a disused small-pox hospital, which can

be opened to receive any cases of infectious disease should a major epidemic strain the regular accommodation. In the southern part of the county, and not in this district, two sick bays and one home for unbilletable children are available for the reception of children from this area.

Experience in this rural reception area has shown the need for the following institutions.

1. *Sick Bay.*—It is estimated that about 2% of evacuated children require indoor treatment for minor ailments. Beds should be provided on this scale for *minor non-infectious* illnesses and for convalescents from more serious ones. If enuretics are admitted the proportion of beds would be increased—e.g., to 3% to 4%. All enuretics would be admitted for observation and treatment. According to their response they would be sent either to billets or to a long-term hostel to continue treatment. Private houses are very suitable as sick bays, as they provide rooms for the separation of complaints. All major infectious illnesses would be sent to the fever hospital of the county authority.

2. *A Long-term Hostel.*—This would be under the control of the doctor and matron of the sick bay. A matron or housekeeper, not necessarily a trained nurse, would be in charge. Difficult cases of enuresis and retarded children needing special care would be housed here.

3. *A Hostel for Minor Infectious Diseases.*—Complicated and uncomplicated cases of measles, German measles, whooping-cough, chicken-pox, and mumps would be admitted Also children with skin affections and dirty heads would be treated here as in-patients or out-patients. A trained nurse would be in charge. It would be advantageous to have hostels provided by more than one local authority. It is not unusual for a ward in one of these to be in quarantine through the occurrence of a second infectious illness. This causes difficulty if other accommodation is not available.

4. *A Maternity Home.*

5. *A Short-term Home* for the little children of lying-in mothers.

6. *A Psychiatric Home* for the treatment of difficult children, including some bed-wetters. This institution could serve a large area or, alternatively, could be associated with the sick bay.

7. *A Hostel* where children may be temporarily housed should absence, sudden illness, or other cause prevent the foster-parent looking after the children.

If a hall is required for the use of refugees it should be carefully chosen in advance. It should have separate accommodation for the isolation of suspected cases of infectious illness and contacts: an adjacent small house might be available. Adequate lavatories and washing places, either in the building or close by, are essential.

This list of suggested institutions may seem to be an extravagant one, but it is largely in accordance with the advice of the Ministry of Health. If the health, comfort, and happiness of those who come to us from the danger zones can be better promoted by these means no one would grudge the expense.

The twentieth annual report of the National Executive Council of the British Legion (issued from Cardigan House, Richmond Hill, Surrey) states that during the year ended September 30, 1940, over 4,000 disabled men, war widows, and dependants sought the assistance of the Legion in connexion with claims for compensation from the Government. Constant liaison with the Ministry of Pensions has been maintained. When dealing with compensation claims the medical factor plays an important part, and in 194 cases where there had been a material conflict of medical opinion the advice of eminent medical and surgical specialists was sought. The council records its warm appreciation of those members of the medical profession who have assisted in this way, and also many local practitioners who submitted very full reports on cases.

ORGANIZATION OF RADIOTHERAPY IN WARTIME

The Faculty of Radiologists called a meeting on February 21 to discuss the question of the organization of radiotherapy in wartime, in view of the interruption in cancer treatment owing mainly to the evacuation of population from large centres into areas where the special facilities for diagnosis scarcely exist, and those for treatment, especially irradiation, do not exist at all.

Dr. W. M. LEVITT, who presided, said that a recent census taken by the Faculty of the work done in the radiotherapeutic departments of the voluntary hospitals of London showed that the number of *x*-ray treatments per day on the average was about 176, as compared with 321 before the war. Therefore 45% of the patients previously being treated in these hospitals were no longer coming for treatment. This reduction in numbers was due not to the contraction of facilities but largely to the dispersal of the patients themselves over the countryside. Early in the war the Ministry of Health was asked to take the responsibility for the organization of the radiotherapeutic service on the lines possibly of the E.M.S. The reply was that the Ministry did not regard this as part of its work, and that it was the duty of the voluntary hospitals to make their arrangements to meet the emergency. Later the Ministry agreed to put at the disposal of cancer patients a generous number of beds in E.M.S. hospitals provided that the cost of maintenance was borne by the voluntary hospitals from which the patients would be referred. A scheme for London had been proposed on those lines, and similar schemes for other large centres were under examination. Such a plan would be excellent from many points of view. It would mean that patients at present treated in London would be moved out and treated in safer areas, and that facilities would probably be concentrated in a few places, so that the utmost economy of apparatus would obtain. Two days previously the Ministry of Health had issued a circular (No. 2283), which in a letter was interpreted as follows by an officer of the Ministry:

"All evacuated persons are to be eligible for treatment in E.M.S. hospitals in addition to those persons normally transferred to E.M.S. beds from the town hospitals. Accordingly all these persons will now be brought without difficulty into the hospital system when they need treatment, and all that remains is to ensure that cancer beds to which they can be transferred when necessary are available as required.

It looked from this statement as though the Ministry was prepared to bear the cost of these patients, though it did not actually say so. If it did bear the cost this might furnish a real basis for the solution of their difficulties.

Action of the Radium Commission

Dr. MALCOLM DONALDSON, as a member of the Radium Commission, explained briefly what the Commission had been doing since the beginning of the war. It had told the Ministry that country centres should be started where radium treatment could be carried out in isolated buildings in comparative safety. What Dr. Levitt had just announced might facilitate this development. It had been suggested that three centres should be organized for the London area, and for the rest of the country possibly six. The London area was intimately connected with King Edward's Hospital Fund: the Radium Commission and the Fund had got together, and the Fund had asked the representatives of certain hospitals to meet it to discuss the formation of one centre to start with. His own view was that the centre should be a unit of 200 beds, and that a staff of radiotherapists and possibly surgeons should be chosen from the hospitals which were co-operating in the centre.

Mr. ROCK CARLING said that such a centre must be envisaged as a complete whole. It was not enough merely to move the radium and *x*-ray sets out to the hospital at the periphery, but the staff, including those giving radium and *x*-ray treatment and the specialists in surgery and medicine, must work together as a unit. The physicists must be there, too, for although treatment had been to some extent arrested by the war, research on the physical side had been extremely active. There was one difficulty that he foresaw which was rather

peculiar to radiotherapy. If a surgeon had a patient with tumour of the brain it was a matter of indifference whether he sent him to Queen Square, London, or to Manchester, Edinburgh, or Oxford. But he believed that the radiotherapist up to the present felt a certain amount of reluctance about transferring his case into the care of another radiotherapist who possibly used a method which he did not approve. He hoped that he was mistaken, and that there was in fact in radiology more standardization than he had supposed.

Regional Expedients

A number of speakers from various areas then described the circumstances in their localities. Dr. BOOTH of Wolverhampton said that at first his town had combined with Birmingham in taking over two wards of a hospital in Staffordshire, Wolverhampton having five beds and Birmingham twenty. The radium was kept in a well in the grounds of the hospital, and only such portions of it were brought up as were necessary for daily treatment. For reasons partly financial the joint clinic was given up, and Wolverhampton was now treating patients with its own radium (240 mg.)—another 200 mg. lent by the Radium Commission had been buried—in a reinforced basement block of its hospital. Dr. F. ELLIS (Sheffield) said that at first a centre with twenty-five beds was established about eighteen miles from Sheffield and worked very well for about a year. Then the place chosen became a vulnerable area, and a move was made to another place, where the twenty-five beds for radium treatment were transferred, while the *x*-ray apparatus was taken to the outskirts of Sheffield together with, in a separate building, a ward of ten beds. A further six beds were arranged in the hospital in the centre of the city, the patients being taken by ambulance for *x*-ray treatment.

Dr. B. W. WINDEYER said that the bigger and more pressing problem in London was that of diagnostic centres where it was possible to get hold of the cancer patients in the first instance. He thought also that it would be a retrograde step to set up radiotherapeutic centres divorced from the general clinical and pathological side of hospital work. They had been asked not to use radium for interstitial work, at least in London, and to use radon. But the position of radon supply had been rather desperate. The other day he sent a requisition for radon treatment for two cases of carcinoma of the cervix, and the reply was, "You can have it by April 13." But he understood that the position would soon be a great deal better because of the generous provision of the British War Relief Society, an American charitable organization, of £5,000 for a radium centre in the south of England.

After others had briefly spoken, Lieut.-Colonel A. B. SMALLMAN (Medical Officer, Ministry of Health) described the situation with regard to radium and *x* rays before and after the change in the character of the war in the autumn of 1940. Before that date *x*-ray treatment was being carried on in the ordinary fashion and radium treatment in a restricted fashion owing to the precautions which were taken for the safety of the element. Last autumn a new situation was created. Many *x*-ray departments had to be closed down, and radium treatment was still further restricted. Probably the best thing to be done was to form cancer treatment clinics in hospitals outside the big towns in comparatively safe areas, and of such a kind that by the transfer to them of radiotherapeutic apparatus and staff, the surgeons being already in the hospitals, it would be possible to form real cancer-treatment units. The interest of the Ministry of Health, of course, was not particularly in radium or in *x* rays, but in the whole of cancer treatment. Inquiries to this effect were being made in some of the most badly bombed towns, and were not yet completed. People seemed to wish to go on in the old fashion of separate radium centres. The Ministry was prepared to give whatever help it could, working through the agency of the E.M.S., as indicated in the chairman's announcement at the beginning of the meeting.

Dr. RALSTON PATERSON of Manchester deplored the creation of waiting lists in cancer cases. A delay of six weeks to two months was sufficient to convert a large majority of the curable cases into cases for palliative treatment only. With the exception of some relatively rare cancers, the cancers in which a reasonably high percentage of cases could be cured were those of the skin, mouth, breast, and cervix uteri, and the last was probably the most important because of the manner in which it occurred in relatively young women and usually in mothers of families. In Manchester, since January, 1940, the situation had been met by the creation of a small country unit of twenty beds in which purely radium work was done, and with this it was possible to cope with work represented by fifty or sixty beds, patients being admitted in the first instance to the central hospitals with which the unit was integrated. After bombing started some twenty outside hospitals in North and East Lancashire and Cheshire were used as subsidiary clinics to augment the work of the central clinics, practitioners in the areas concerned were notified, and the loss of patients at the central clinics was largely made good at these outside places, which in peacetime would be too small for the purpose. His general conclusion was that each hospital, voluntary or municipal, and each radium centre must face its own problems and solve them to the best of its ability, endeavouring to keep its own clinics going and to create new ones in accordance with the requirements of cases. He thought they had a claim on the Ministry to help them to meet the additional expenditure entailed, in that the cases were as much casualties of war as those which were due to direct enemy action.

SHORTAGE OF DRUGS

MINISTRY OF HEALTH'S STATEMENT

Certain drugs are now scarce or unobtainable as a result of a number of causes arising out of the war. Many such drugs can be replaced by others which are in plentiful supply and have substantially the same action. The Ministry of Health and the Department of Health for Scotland therefore urge doctors to refrain from ordering or prescribing any scarce drug for which a satisfactory alternative is available. For the guidance of the profession, a report of the Therapeutic Requirements Committee of the Medical Research Council will shortly be issued, containing recommendations on the replacement of scarce drugs by others with equivalent action.

Defence Regulation

As a further step, a Defence Regulation has been made empowering the Minister of Health and two Secretaries of State (acting respectively for Scotland and Northern Ireland), after consultation with the Medical Research Council, to make Orders dealing with the replacement of scarce drugs by alternatives having substantially the same therapeutic action. The general effect of any such Order will be to authorize a chemist who receives a prescription including a scarce drug to supply instead the alternative named in the Order. Any such Order will not apply if the doctor expressly writes against the scarce substance in the prescription the letters "N.A.," or words indicating that no other substance is to be used or supplied in lieu of the scarce substance.

Potassium Salts

An Order has now been made under these powers authorizing the replacement of potassium bicarbonate, potassium bromide, potassium iodide, and potassium citrate by an equal quantity of the corresponding sodium salt, subject to the right of the doctor, as already mentioned, to give a special direction that no alternative is to be used. Further Orders will be made from time to time as required.

Economy in Use of Squill

With a view to conserving the available supplies of squill, doctors are asked to refrain from prescribing squill in all cases where its use cannot be said to be essential. The principal galenicals containing squill are: Acet. scillae, ext. scillae liq., oxymel scillae, syrup, scillae, tinct. scillae; and the strictest economy should be exercised in the use of these preparations.

The committee recently set up by the Ministry of Health to prepare a War Emergency Formulary has under consideration the question of mixtures and linctuses containing preparations of squill, but, pending the issue of revised formulae, a doctor

when prescribing by title only a mixture or linctus containing squill should consider whether the squill is essential, and if he decides that it is not he should indicate on the prescription that the squill should be omitted. The following are the more frequently prescribed preparations containing squill:

Mist. diuret. N.F. contains acet. scillae.
Mist. expect. alk. N.F. contains ext. scillae liq.
Mist. expect. nig. N.F. contains ext. scillae liq.
Mist. ipecac. c. scill. N.F. contains ext. scillae liq.
Mist. senegae ammon. N.F. contains ext. scillae liq.
Linct. scillae co. B.P.C. contains oxymel scillae.
Linct. simplex N.F. contains oxymel scillae.
Mist. oxymellis N.F. contains oxymel scillae.
Mist. scillae co. N.F. contains oxymel scillae.
Linct. morph. rub. N.F. contains syrup. scillae.
Mist. tuss. rub. N.F. contains syrup. scillae.
Mist. digitalis c. scill. N.F. contains tinct. scillae.

AMENDMENTS TO THE BRITISH PHARMACOPOEIA

An official notice appeared in the *London Gazette* of February 28 concerning alterations and amendments to the *British Pharmacopoeia, 1932*, whereby a number of medicines and compounds and the directions for preparing some of them are modified. These amendments, made by the General Medical Council, became official from the date of the publication of the notice in the *London, Edinburgh, Belfast,* and *Dublin Gazettes*. Briefly stated they are as follows:

Cataplasma Kaolini: Poultice of Kaolin. Sodium lactate (70%) may be used, in place of glycerin, in making this poultice. When sodium lactate (70%) is used the formula is modified so that 425 grammes of the sodium lactate replaces the same weight of glycerin; and the directions for mixing the ingredients are varied accordingly.

Sodii Lactas: Sodium Lactate. Sodium lactate (70%) for the above purpose may be prepared by addition of sodium hydroxide or sodium carbonate to a hot dilute solution of lactic acid, and subsequent concentration. It contains 70% w/w of $C_3H_5O_3Na$ (limits, 68 to 72), and about 20% w/w of water.

Scilla: Squill. When squill is prescribed, or demanded, Indian squill may be dispensed or supplied.

Acetum Scillae: Vinegar of Squill. Indian squill may be used, in place of squill, in making this vinegar.

Oxymel Scillae: Oxymel of Squill. Indian squill may be used, in place of squill, in making this oxymel.

Tinctura Scillae: Tincture of Squill. Indian squill may be used, in place of squill, in making this tincture.

Indian squill is the bulb of *Urginia indica* Kunth, divested of its dry membranous outer scales, cut in slices, and dried. When powdered it is very hygroscopic and should be kept in a desiccated atmosphere. Doses: Metric, 0.06 to 0.2 gramme; Imperial, 1 to 3 grains.

Valeriana: Valerian. When valerian is prescribed, or demanded, Indian valerian may be dispensed or supplied.

Tinctura Valerianae Ammoniata: Ammoniated Tincture of Valerian. Indian valerian may be used, in place of valerian, in making this tincture.

Indian valerian consists of the dried rhizome and roots of *Valeriana wallichii* DC. *It contains not more than 2% of other* organic matter. Doses: Metric, 0.3 to 1 gramme; Imperial, 5 to 15 grains.

Appendix VI: Quantitative Test for Lead. In the table on page 558 of the *British Pharmacopoeia, 1932*, insert:

Sodii Lactas	12	5	2	5	10	10

Appendix VII. Quantitative Test for Arsenic. Add the following method:

Sodii Lactas .. .. Limit, 5 parts per million.
Treat 2 grammes as described under "Potassii Acetas."

Third Addendum to the British Pharmacopoeia, 1932. Correction, page 15. Mepacrinae Hydrochloridum, Mepacrine Hydrochloride. The statement of doses should read:

Metric	Imperial
0.05 to 0.1 gramme	¾ to 1½ grains

U. J. Wile and H. H. Houman (*Arch. Derm. Syph.*, 1940, **42**, 587) record two cases, in men aged 52 and 58, of generalized herpes zoster associated with lymphatic leukaemia, of which the first example was described by Fischl in 1914. This association is most frequent in middle-aged men.

Reports of Societies

INJURIES TO PERIPHERAL NERVES

A meeting of the Orthopaedics Section of the Royal Society of Medicine was held on February 22 for a discussion on "Injuries to Peripheral Nerves."

Mr. S. L. HIGGS, in taking the chair, said that the treatment of peripheral nerve injuries had, owing to the war, become of first-class importance. It was true that much research had been done on nerve grafting and regeneration during the last few years, but the practical problem of restoring the nerves remained much as it was left at the end of the last war. It was very necessary to recall the lessons which were then learned.

Mr. W. ROWLEY BRISTOW said that injuries to peripheral nerves, relatively unimportant in peacetime, took an altogether new position in war, and it had been thought well that these cases should be segregated. The segregation was at present mainly in three centres, but if casualties increased every orthopaedic centre would get its fill of this work. It was necessary for the older surgeons to cast their minds back for some twenty years in order that some elementary mistakes should be avoided. It was impossible to keep these patients in hospital during the whole of the long period required for recovery of nerve function; therefore arrangements were being made to have them re-examined by the surgeons and physicians who handled such cases in the last war, and an effort would be made to follow them up and have them back at their original centres for re-examination at intervals of two months or so.

The material under review at one centre at present comprised 145 cases. Injuries of the ulnar nerve predominated, followed closely by injuries of the musculo-spiral and median, and then of the sciatic. Up to date only twenty-three of these patients had been dealt with by operation. During the period of observation treatment was divided into postural and that directed to aid nutrition. In postural treatment the relaxation of the paralysed muscle, with which they were all so familiar, was carried out. There was only one proviso—namely, that they must not keep the hands stiff in a case of musculo-spiral palsy. In sciatic nerve injury there were two deformities to be considered from the point of view of postural treatment—namely, fixed flexion deformity of the interpharyngeal joint of the great toe, and foot-drop.

In treatment directed towards aiding nutrition they worked on the ordinary lines—heat, massage, electrical stimulation, re-education, and exercise. How far was electrical stimulation of muscles of real value after complete division of the nerve? His mind was not made up on this point. On the physical side no treatment of this kind had any effect on the rapidity or completeness of the regeneration of the nerve, but on the psychical side it did make a difference for the patient who had a paralysed limb to see his muscles contracting and relaxing and to see a joint which had appeared paralysed and dead moved again by the action of his own muscles, encouraged by the masseur.

Principles of Operation

With regard to the time of operation (Mr. Bristow continued) it was laid down by the Medical Research Council after the last war that no period was too long to preclude the possible regeneration of the nerve. J. S. B. Stopford of Manchester, in the *British Journal of Surgery*, 1922, published the results of resuture of injured nerve in cases in which the primary suture had failed, and his conclusion was that if a period of more than three years had elapsed since the time of the injury suturing was not worth while, but that it was worth while at any time up to two years. Harold Stiles, writing in one of Sir Robert Jones's books at about that time, said that he always felt it was wiser to operate early, and, as a rule, in cases in which he had waited a long time because they were showing some evidence of early regeneration he found when ultimately he had to operate that it would have been better

if he had operated sooner. A consensus, therefore, favoured early operation, as soon as circumstances permitted.

Repair was effected by end-to-end suture. He stressed the need for very wide exposure. The ulnar nerve could be exposed from the wrist to the axilla, and the freeing of it, in his experience, had never resulted in any ischaemia. Before operating it was essential that the surgeon should know a good deal about the patient. This was not a question of walking into the theatre to perform a technical exercise. One must be prepared to examine the nerve with a faradic battery or condenser discharge apparatus at the time of operation. In operating on a mass of scar tissue one would sometimes be not too certain which nerve was which, and the faradic apparatus would be of great help in differentiating.

The question of neurolysis and the freeing of scar was one of mobilization. It was a matter not of peeling off a sheath, but rather of freeing the nerve from the scar tissue which was pulling on it and irritating it with every movement of the limb. The great majority of nerve grafts in the last war had failed. Since then work had been done on the facial nerve in which the value of graft had been proved. He personally had an open mind about grafting, but it was certain that the autogenous cable graft was to be recommended. It was possible that the new method of suture by fibrinogen in plasma might make a difference. Imperfect recovery of function and sensation was almost invariably found in the most favourable cases after secondary suture or resuture, but, as Farquhar Buzzard had said, even when injuries to the nerve involved complete division they might in favourable circumstances be successfully treated in so far as a certain degree of usefulness was retored to the limb. If, however, the parts affected were needed for highly specialized work or sustained effort they were almost certain to be found wanting.

Disturbances of Function

Dr. J. ST. C. ELKINGTON said that from the clinical point of view lesions of peripheral nerves constituted a number of clear-cut and uniform pictures. He discussed them under the headings of motor, autonomic, and sensory functions. In the case of motor function he pointed out the necessity for differentiating clinically between anatomical severance of the nerve and a state in which the fibres were temporarily out of action without being divided. In many cases it was possible, even in the early stages, to make a fairly accurate guess whether the motor fibres of a peripheral nerve were truly divided or merely out of action. With the undivided nerve the tone of the muscle very often did not disappear completely, and the degree of wasting was much less. But sometimes the two conditions could not be distinguished clinically, and it was here that electrical examination was important. Another point in motor function was the relative vulnerability of the different types of fibres in a mixed bundle. The motor fibres appeared to be exceptionally receptive of injury, and might lose function while sensory nerves retained it, a fact which had led many to regard some conditions, wrongly, as functional.

Autonomic disturbances were particularly to be seen in the skin, but also in the subcutaneous tissue. The most conspicuous was loss of sweating; another was an increase in the growth of hair in the affected part. There was a decrease in the normal power of healing of the tissues. In long-standing cases there might occasionally be seen a marked osteoporosis in the bones of the affected limb. Derangement of sensory function was usually found distributed in two ways, the more important being diminution or loss of one or more varieties of sensation, and the other, spontaneous sensation in the absence of adequate stimulus. In any given mixed group of nerves the area of total sensory loss was very much less than the area anatomically supplied by the nerves. During the recovery of sensory function the first step was generally the return over the completely anaesthetic area of crude sensation, followed by a gradual shrinkage of the abnormal area as normal sensation advanced.

Pathological Aspects

Dr. J. G. GREENFIELD said that almost everything depended on the bridge between the two ends of the divided nerve; this was true in cases of complete division of nerve fibres even when the sheath of the nerve was not damaged, as in bruises. Even under ideal conditions, such as animal experiment, it was out of the question to expect the nerve fibres growing out from the upper end to reach the corresponding nerve fibres at the lower end with which they had had contact before, because there was always in division a very intricate neuroma with numerous axons coming off; similarly there was branching of the old nerve channels from the lower end. Nevertheless, owing to various factors, including re-education, conscious and unconscious, the end-results might be fairly good. In this bridge of the gap there was considerable delay while the nerve fibres were finding their way through the complex neuroma to the peripheral end. It was remarkable how long these peripheral channels remained in perfectly good condition for receiving the new nerve fibres. For as long as two years they could accept the nerve fibres and conduct them to the end-organs, and that was one of the hopeful points about nerve grafting.

Mr. JOCELYN SWAN, speaking about the time to operate, said that in the last war they learned to place very great reliance on condenser discharge reactions. A nerve which did not show any change in voluntary response might show a definite change in response to electrical stimulus. That led to delaying the operation in many cases, and in a number of these it had been possible to see return of function without operation. In his view no nerve case should be operated upon for five or six months after the injury, nor for two and a half to three months after the wound was soundly healed and the condition had become satisfactory. At operation a wide exploration of the nerve should be made, particularly above and below the region of injury. He condemned any suture which went through the nerve. All nerve sutures should be done in a perineural operation with the finest thread that could be obtained. With regard to end-results, it was not possible in the last war to get anything like a good follow-up, but he was able to follow a number of cases for a year or eighteen months, and had had many letters from patients. Best results were obtained with the musculo-spiral nerve. He did not think the patient with a median-nerve injury ever completely regained the sensibility of his fingers. With the sciatic nerve the results were not good. Better results were obtained with the external popliteal than with the internal.

Dr. GEORGE RIDDOCH said that one serious defect in the treatment and repair of patients in the last war was in follow-up and after-care. The Medical Research Council was now planning an adequate follow-up of a sufficient number of cases, at least one thousand, over a period of five years. Adequate occupational therapy would be introduced at the centres, and when the patients were discharged he hoped there would be a scheme whereby they could obtain what physical treatment was needed. A man ought to be placed for treatment as near his home as possible and as soon as possible. The initial distribution of patients before actual treatment was started should be made with a view to the convenience of the subsequent follow-up. The plan proposed would include the employment of research workers.

SERUM TREATMENT OF DIPHTHERIA

At the last meeting of the Section of Medicine of the Royal Academy of Medicine in Ireland, with the president, Dr. R. H. MICKS, in the chair, Dr. R. A. Q. O'Meara and Dr. C. J. McSweeney read a paper on the serum treatment of hypertoxic diphtheria.

Dr. O'MEARA compared the clinical results from diphtheria antitoxin now obtained with those of the earliest days of its use, showing that matters were worse rather than better, and that some essential factor had been missed out in the process of development of antitoxin. He advanced a new conception of the nature of diphtheria toxaemia and the specific treatment required to combat it. The toxin, he said, was composed of two substances, one of which (A) was highly lethal to the guinea-pig and present in large amounts in Park-Williams No. 8 toxin as prepared in the laboratory. It had been assumed that hypertoxic diphtheria was due to the production of this substance in excessive amounts, but in actual fact little of it was found in the human patient. Conversely, laboratory toxin contained relatively little of the second con-

stituent (B), but it was this substance which determined hypertoxic diphtheria. "B" promoted the penetration of the tissues by "A," and, in excess, led to a great increase in the size of the local lesion, in the gelatinous oedema around it, in the amount of necrosis, and in the tendency to wasting and paralysis. Ordinary antitoxin contained a high proportion of the antibody to A, but relatively little of that to B. On the administration of antitoxin clinically, therefore, B was not neutralized and the antitoxin was rendered non-avid, dissociation of toxin from antitoxin took place on dilution in the body, and the toxaemia continued unabated. Antitoxins rich in the antibody to B were required for the treatment of diphtheria toxaemia.

Dr. C. J. McSWEENEY recapitulated the clinical manifestations of hypertoxic diphtheria: faucial oedema which might even simulate quinsy; rapidly developing cervical cellulitis involving the whole of the tissues—so-called "bull neck", albuminuria beginning after the fourth day and persisting for two, three, or four weeks; subcutaneous or submucous haemorrhages (in the most severe toxaemias only); fall in blood pressure, most marked just before the onset of symptoms, and cardiovascular failure on or before the tenth or twelfth day. He then classified under four grades all cases admitted to Cork Street Hospital. In Grade I the membrane was confined to the tonsils, or was purely laryngeal, and took the form of speckling, spotting, or scattered patching. In Grade II there was a coherent patch of membrane not involving the palate, or in the larynx with faucial lesions not extending over the pillars. In these cases toxaemia was present and paralytic sequelae not uncommon. If death occurred in either of these grades it was due to some intercurrent cause, not toxaemia. In Grade III the membrane involved the palate, with or without investment of the uvula and or nasal discharge. Toxaemia in this grade was considerable, and there was usually much faucial oedema, bull neck, and multiple paralyses. These cases constituted fully 75% of the "gravis" diphtheria problem. In Grade IV there were toxic haemorrhages from mucous membranes and into subcutaneous tissues, with bruising at the site of injections, associated with lesions in the nasopharynx and much oedema of the throat. Toxaemia here was extreme and cardiovascular failure inevitable when commercial antitoxins were used. Multiple paralyses were almost inevitable in survivors, and these cases constituted the remaining 25% of the "gravis" problem. The grades represented stages of the process of circumferential spread of the membrane. In hypertoxic diphtheria all stages might be gone through within twenty-four or thirty-six hours. The degree of toxaemia was indicated by the sum of the two factors: extent of membrane, and oedema. No anxiety need be felt about paralyses in Grade II cases if commercial antitoxin were given reasonably promptly. For some reason, once the membrane crossed the faucial pillars dangerous cardiovascular sequelae were to be expected. The case fatality was 1% or less in Grades I and II; nearly 16% in Grade III; and nearly 50% in Grade IV. In April, 1940, a small quantity of Dr. O'Meara's avid serum rich in anti-B factor had become available for use in eight Grade III and eight Grade IV cases. The first four were given maximal doses corresponding to those of commercial antitoxin; the remaining twelve were given from 16,000 to 40,000 units each. Only one death occurred, a case mortality of 6.2%, as compared with the 50% anticipated in this type of case. After relating four case histories Dr. McSweeney summarized the difference in clinical behaviour as follows: none (except the fatal case) showed early or late cardiovascular failure; the clearing of the oedema and membrane was much accelerated; there was little or no albumin in the urine at any time; only a few paralytic sequelae were observed; the bull neck often disappeared within forty-eight hours of administration of the new serum; and there was no appreciable fall of blood pressure but, indeed, in some cases a rise.

After the anti-B factor serum had been used up, twenty consecutive Grade III and IV cases had been treated with serum taken from the same horse, only at a much later stage, when little or no anti-B factor was present—thus corresponding with commercial antitoxin. The case fatality rate had been 40%. The clinical proof of Dr. O'Meara's thesis appeared to be complete. Unfortunately serum rich in anti-B factor was not at present available.

Prof. HENRY MOORE characterized this as a monumental communication. Dr. A. R. PARSONS asked why Dr. McSweeney had drawn the line at 120,000 units; he himself never gave more than 100,000 units. He asked where the limit should be drawn, and if the serum neutralized in the same way as an alkali did an acid. Dr. T. O. GRAHAM said that the toxicity of diphtheria in Dublin was very high compared with other parts of the world. The variability in antitoxic properties of sera was probably due to varying amounts of B antibody. Dr. J. McCANN asked if it was now wise to give large doses of streptococcal serum in cases complicated by a secondary streptococcal infection. Dr. W. R. F. COLLIS asked if convalescent serum had been tried, and if suprarenal extract had been used to tide patients over the critical stage of fall of blood pressure. Prof. L. ABRAHAMSON said that he had recently become aware that diphtheria mortality was creeping up and that serum was losing its efficacy in some cases. Prof. HANS SACHS stressed the fact that the pharmacological action of diphtheria serum was not really helpful from the human point of view, though it had antitoxic value as a serum. He wondered if the problem of avidity were really related to the B toxin. Some substances which intensified the action of toxin also intensified the action of other toxins, and the bacilli might produce not the real toxin but a pro-toxin. Dr. BRENDAN O'BRIEN asked if in Grades III and IV there were any cases known to have been immunized by the ordinary methods available. Dr. OLIVER FITZGERALD asked if the B substance could be removed and A only injected; if so, would there be no reaction at all? Dr. ALAN THOMPSON asked whether in the first thirty-six hours there would be better results from using a mixture of avid serum and ordinary commercial serum, providing both anti-A and anti-B substances.

Local News

SCOTLAND

Orthopaedic Care in Scotland

In an address to the Edinburgh Women's Luncheon Club on February 19 Dr. J. M. Mackintosh, Chief Medical Officer of the Department of Health for Scotland, said that when the war came to an end some of the very large number of hospitals which the Department of Health had built and had taken over would have to be used for pensioners and some would be absorbed in meeting the shortage of beds which had been notorious in the general hospitals for many years past. With those that remained he hoped something more creative would be done, and he suggested that some part of these beds should be devoted on a regional plan to the care of crippled children. In England there were over forty voluntary orthopaedic hospitals, many of them with a number of clinics served from the centre. In Scotland there was one hospital, the Princess Margaret Rose Hospital, which had developed an orthopaedic system on the English model, and there were one or two municipal hospitals doing orthopaedic work, but in general very little had been done for the crippled child. Four first-class country hospitals were wanted for chronic orthopaedic cases. The hospital by itself, however, was not enough; the early discovery of the cripple, diagnostic facilities, and various kinds of care were also needed.

International Control of Disease

Sir Alexander Russell, who until recently was Public Health Commissioner with the Government of India, lectured at Dundee on February 24 on the international control of disease. He described the setting up of the International Office of Public Health with its headquarters in Paris and the framing of the first International Sanitary Convention in 1912. He referred particularly to the new aspect in international control since air traffic began to make it possible for infected persons and insects to be transferred thousands of miles within the incubation period of many of the dangerous infectious diseases. An air convention was adopted in 1934 whereby, in countries where plague, cholera, and small-pox were endemic, passengers leaving by air were required to be in possession of recent

inoculation and vaccination certificates. Under the terms of the convention every country was required to notify particular aerodromes as its ports of entry for air traffic, and these aerodromes had to comply with certain requirements before they could be classed as "sanitary." Until the fall of France the Paris office held meetings every six months to review the working of the conventions. Sir Alexander Russell is now in charge of anti-diphtheria measures in Scotland, and he mentioned that during the last six weeks approximately 250,000 persons had been immunized; the number aimed at is 800,000.

Hospital Beds in Glasgow

Sir Patrick Dollan, Lord Provost of Glasgow, presiding at the Court of Contributors of the Victoria Infirmary on February 19, suggested that an excessive number of beds had been reserved for air-raid casualties in Glasgow. He urged that the Department of Health should review the matter and take more into consideration the local knowledge of hospital governors and staffs. At the Victoria Hospital there were 300 beds so reserved, and the average waiting list at this hospital was above 600. He also drew attention to the large number of road accident victims, and suggested that the three city infirmaries—the Royal, the Western, and the Victoria—should combine in an inquiry into the subject, on the assumption that a large number of these casualties were avoidable. One matter for inquiry might be the fact that five times more males than females were injured; was it that women were more "safety-conscious" than men? It was reported that at the Victoria Infirmary there was a deficit on general maintenance account of £17,000. The cost of maintenance, owing to the rise in the price of commodities, showed an increase of nearly £12,500 over that for the previous year.

Central Midwives Board

At the last meeting of the Central Midwives Board for Scotland intimation was made of the appointment of the following persons to be members of the Board for a period of five years. The appointing body is named within parentheses.

Mr. Peter Taylor, Mrs. Frances A. W. B. Allan, Miss Mary McGhie, Miss Margaret Wilson Risk, and Miss Margaret Rachel Gouk (Department of Health for Scotland).

Mrs. Clarice M. M. Shaw (Association of County Councils for Scotland).

David Robertson, M.A., LL.B. (Convention of Royal Burghs).

Miss Isabella Cromarty Dewar (Queen's Institute of District Nursing, Scottish Branch).

A. S. M. Macgregor, M.D., F.R.F.P.S. (Society of Medical Officers of Health for Scotland).

Prof. R. W. Johnstone, M.D., F.R.C.S.Ed., F.R.C.O.G. (University Court of Edinburgh).

Prof. Margaret Fairlie, M.B., F.R.C.O.G. (University Court of St. Andrews).

Prof. James Hendry, M.B., F.R.F.P.S., F.R.C.O.G. (University Court of Glasgow).

Prof. Dugald Baird, M.D., F.R.C.O.G. (University Court of Aberdeen).

W. F. T. Haultain, M.B., F.R.C.S.Ed., F.R.C.O.G. (Royal College of Physicians of Edinburgh, Royal College of Surgeons of Edinburgh, and Royal Faculty of Physicians and Surgeons of Glasgow, conjointly).

David Dale Logan, M.D., F.R.F.P.S., and William Leslie Cuthbert, M.B. (Scottish Committee of the British Medical Association).

Prof. Johnstone and Prof. Hendry were elected chairman and deputy chairman respectively for the ensuing year. Examiners were appointed and institutions were approved for the training of pupil midwives.

IRELAND

Medical Meetings in Belfast

A wartime innovation has been introduced in the collaboration of the Ulster Medical Society and the Northern Ireland Branch of the British Medical Association in a series of very successful meetings which are being held in the Whitla Medical Institute, Belfast, every fortnight. Members of the R.A.M.C. are invited, and there has been a large attendance at every meeting to hear papers on varying subjects and to take part in the discussions. The first of the series, under the presidency of Mr T. S. S. Holmes, was held on November 20, 1940, when Lieut.-Colonel L. B. Cole read a paper entitled "Diabetic Coma in a Series of Young Diabetics." He dealt with the causes of coma and its treatment, and mentioned some measures which might prove effective in its prevention. In a paper entitled "Peripheral Arterial Embolectomy" Major H. Agar recorded the operative details as well as actual cases, and explained that this condition, formerly thought hopeless, could now be tackled surgically with a reasonable hope of recovery.

The meeting on December 4 was preceded by the ceremony of the unveiling of the portrait of the late Sir Robert Johnstone—a gift from Lady Johnstone. Mr. Holmes paid eloquent tribute to Sir Robert's professional attainments and spoke warmly of his qualities as a man. Dr. Charlotte Warner then read a paper on "The Child, the Community, and the General Practitioner," in which she emphasized the importance of the doctor's taking a more active interest in the child's welfare from the post-natal period to the years of puberty. She also expressed the opinion that advice should be given by a doctor rather than by the child's relatives, and illustrated her contentions by quoting cases with which she had come into contact. Major B. W. Rycroft read a paper on "Some Recent Advances in Ophthalmology" and illustrated it with two films, one on the fitting of contact glasses and the other on corneal grafting. At the next meeting Lieut.-Colonel R. W. D. Turner, in a paper on "Sciatic Pain," outlined the defects in the present means of diagnosis and passed on to a classification of sciatic pain in its different forms. Each condition demanded specific treatment, and Colonel Turner dealt particularly with extradural injection for acute sciatic neuritis and local injection into the fibrositic muscles. Dr. B. R. Clarke read a paper entitled "Case-finding in Pulmonary Tuberculosis." He described the cineradiography method of discovery and illustrated his points with statistics and an excellent series of *x*-ray photographs showing various lesions. Then followed an animated discussion, in the course of which Mr. R. J. W. Withers spoke of his experience with sciatic scoliosis and showed slides illustrating the value of a plaster jacket. Three papers on "Non-penetrating Injuries caused by Blast" were contributed by officers of the R.A.M.C. Lieut.-Colonel R. Coyte classified blast injuries into two main categories—blast in air and in water. He divided these again into injuries caused by near, moderately near, and far-distant blast, and quoted cases illustrative of these types. Major W. C. Barbour described two cases of blast in water in which there had been a perforation of the ileum about eighteen inches from the caecum, and discussed the mechanism of the production of the condition. A paper by Major J. W. Osbourne was read by Major H. E. Bonnell in the absence of the former through illness. The physics of blast waves were dealt with, and quotations from Zuckerman's experiments showed the effects of blast on animals at certain distances. Post-mortem findings were related, together with a description of symptoms and treatment, in the cases of intracranial damage.

A discussion of the casualty services in Northern Ireland was the subject of an interesting meeting in which Prof. T. Flynn, Dr. F. M. B. Allen, and Dr. F. P. Montgomery were the principal speakers. Prof. Flynn, Chief Casualty Officer for Belfast, described the collection of casualties and the procedure to be followed in the event of a raid, emphasizing the importance of the "Report Centre." An account of the Emergency Medical Service was given by Dr. Allen, Hospital Officer to the Ministry of Public Security, in which he described the position of the various hospitals in Northern Ireland and the facilities for the treatment of wounded in the area of each hospital. He mentioned the mobile surgical teams, which could be sent to any part of the country, and emphasized his desire to see a store of plasma in every casualty-receiving hospital. Dr. Montgomery spoke of the Royal Victoria Hospital, Belfast, as a casualty-receiving hospital and discussed the various protective measures for the safety of the institution. He also dealt with the problems of staffing and the possibility of having to carry on the work of the hospital when water, gas, and electricity supplies were not available. During the discussion which followed, the D.D.M.S., Brigadier D. T. Richardson, offered his whole-hearted help to the civil authorities in the organization of the casualty services. At the sixth meeting of the series Dr. R. Thompson of Armagh read an instructive paper on the "Depressive Phase of Manic-depressive Insanity," quoting Kraepelin's classification of the disorder

and detailing the several degrees of the melancholia cases. He discussed the symptomatology of each type and described their treatment, emphasis being laid on prevention of suicide and on the necessity for rest in bed. Prof. J. H. Biggart then gave an address entitled "The Interrelationship of the Endocrine Glands" and showed a large number of slides of the various changes found in cases of overacting and underacting pituitary. He pointed out that the physiology of these glands was based on animal experimentation and was therefore fallacious, and that further human study was required. Through the courtesy of Colonel W. R. Ward, A.M.S., a meeting was held at the 24th (London) General Hospital, at which a large number of cases of clinical interest were shown.

Correspondence

Medicine in a Changing World

SIR,—The correspondence which has followed the publication of the lecture on "Trends in Nutrition" and your leading article on "Medicine in a Changing World" in the issue of January 18 indicates that at least some of the members of the Association think that the medical profession should make a contribution to planning for post-war reconstruction.

While there may be differences of opinion as to what part medicine should play in planning, there is general agreement that planning is necessary. It is now being realized that this war is the convulsive end of an epoch. When the fighting finishes there will be a new order of some kind. To avoid a breakdown of the economic and social system we must have a plan for the adjustment of the existing system to make possible orderly progress towards the new order. To this end the Government has already set up a new Planning Department, and a number of other influential groups are planning independently.

But what are they planning for? Between the last war and this one there was a great deal of economic planning on both a national and an international scale. The main schemes which came to fruition were those which restricted the production and distribution of commodities which people need. This setting up of barriers between the common people and the great wealth which science has made possible tends to perpetuate economic distress and poverty. This led to discontent and a feeling of frustration which the Dictators exploited to gain the allegiance of the common people, and especially of youth, to whom they promised a new and better economic system.

And now we start planning again. But this time, whatever ideas the planners may have, there is a strong and growing opinion that instead of piecemeal planning for sectional interest there should be comprehensive planning for the welfare of the whole population. In Government planning the first objective should be to provide the necessities of life for all the people governed. Mr. Churchill's reference to the fuller life of the common man, and Mr. Bevin's reference to relegating the miseries of poverty to the limbo of the past, as the main objective of post-war reconstruction, have given expression to this idea.

Now here is where medicine can make an invaluable contribution both to national and to international planning. It can define the requirements for physiological and psychological well-being, which are essential for a full life. By defining the first objective of planning they will have set it upon the right course.

In your leading article you point out the danger of the profession's being involved in politics. The profession would lose its influence if it allowed itself to become the battleground for conflicting political and economic theories. While members of the profession as citizens should be free to hold any political views they think right, the profession as a profession should be apart from, and above, politics. But it should be interested in the promotion of health, and planners should look to it for guidance on the kind of conditions under which the common man would be able to attain his fullest inherited capacity for health and physical fitness. A statement of these conditions based on facts, so far as they can be ascertained, would be a scientific, not a political, statement.

If the B.M.A. would undertake the task of laying down the standards needed for health and set them forth in what you, in your leading article, call a "medical charter," it would do much to lift all this planning out of the party political sphere. It would give the planners something definite to plan for, and enable them to deal with realities instead of with political and economic theories. As your correspondent Mr. Sayle Creer points out, the needs of man are absolute and unchanging and can be ascertained by investigation, whereas economic and political laws are alterable by man. Once the standards for human needs have been determined, the necessary political and economic adjustments can be made to provide for the needs. A statement of the needs would be a chart to planners. Once they had a clear idea of what was needing to be done they would tend to forget their conflicting theories and collaborate to devise ways and means of getting at the desired objective.

In the present crisis, when people of all shades of political opinion are co-operating in a spirit of good will to save freedom and build a better world, the B.M.A. can make an invaluable contribution to human welfare. It has the knowledge and the authority to state the first things that should be done. If the terms of the proposed "medical charter" were fulfilled—that is, if conditions were such that the whole population can attain physiological well-being—the worst evils of the past would be abolished. We would be well on the way to the new era of plenty. Indeed, we would be more than half-way home.

It is to be hoped that the B.M.A. will rise to the occasion and produce a charter which might well be of greater importance for humanity than many of the great historic political charters and declarations.—I am, etc.,

Aberdeen, Feb. 24. JOHN BOYD ORR.

*** Sir John Orr's letter, to which reference is made in a leading article at page 366, brings this correspondence to a close.—ED., *B.M.J.*

Effect of Peritoneal Irritation on Intestinal Activity

SIR,—I have read with pleasure and interest the paper by Mr. D. M. Douglas and Dr. F. C. Mann (February 15, p. 227). The subject of functional paralysis of the intestine was the theme of the Bradshaw Lecture I delivered in 1934, and I chose it "in the hope of inciting more workers in this country to enter a field of clinical and experimental research from which knowledge that will halve the risk and quarter the suffering that now attend abdominal operations is waiting to be garnered."

The problem is one which requires a welding of clinical and laboratory research, and no theory founded on experimental work can be acceptable unless it accords with and explains the clinical facts. An enormous number of experiments on dogs and other animals have been carried out, many of which to my mind miss the mark. For instance, a loop of gut or its afferent or efferent vessels are ligatured, and the investigator seeks to discover why the animal develops certain symptoms and dies. But surely the basic reason is the ligature!

Post-operative functional obstruction may be accompanied by peritoneal irritation, but the accompaniment is not constant, and, vice versa, peritoneal irritation frequently exists without any functional obstruction. The cases that most of all need investigation, and an explanation of which would throw a flood of light on the problem, are those in which functional obstruction occurs after operations not opening the peritoneal cavity, such as prostatectomy and nephrectomy, or sequent to states in which an operation plays no part, such as lobar pneumonia and severe injuries about the hip-joint.

The conclusion I reached in my lecture was that the motor and vasomotor disturbances in the intestine, fundamental to the derangement, are caused by an agent generated somewhere in the tissues that the operation, accident, or disease has injured, and that this tissue lies either in the peritoneal cavity or in close proximity to it. Such evidence as is available suggests that its production has some relation to partial circulatory interference in the tissue in which it is produced. Whether the agent, once produced, acts directly by blood or lymph conveyance or indirectly through the splanchnic nerves is not

clear, but the latter seems the most probable if only one manner of action exists. I deliberately employed the term "agent" in the same sense as the mathematician employs "x" to denote an unknown quantity, but if speculation may be indulged in I would say it is probably a substance, biochemical in nature, which antagonizes the mechanism which links the nerve-ending to the muscle.

I would hope that Mr. Douglas and Dr. Mann before they continue their valuable work would read my paper (if they have not already done so), because I think it would help them to determine the course that experimental work should take in order to reap the greatest advantage.—I am, etc.,

Feb. 23. VICTOR BONNEY.

Chemoprophylaxis by Proflavine

SIR,—In the valuable contribution made by Dr. Frank Hawking on the prevention of gas-gangrene infections by the local application of sulphonamide compounds, published in your issue of February 22, there is a short reference (p. 265) to comparative tests made with proflavine. Considerations of space doubtless prevented the full presentation of his results under this heading, but from what he does say we agree with your leading article on page 283 of the same issue, that the "acridine compounds still have a claim to consideration." Thus Dr. Hawking does not mention whether any of the animals died after proflavine prophylaxis: evidently some survived, because we learn that wounds reopened on the third day showed only small numbers of bacilli and "fairly healthy tissues." This seems to compare favourably with his sulphonamide series, in which he says that "smears from the wounds on the third day invariably demonstrated great numbers of Clostridia," while sloughs and necrotic tissue were present. We regret that he deprecated the use of the acridine compounds on the grounds of the mediocre results obtained in the last war. We have carefully read the reports published at that time and have generally found it impossible to establish which member or members of the acridine series had been used. In our experience both acriflavine and euflavine are highly damaging to the tissues, whereas proflavine sulphate and 2:7-diamino-acridine are practically harmless. We can well believe that a wound might not prosper after treatment with either of the two first-mentioned compounds.

During the past year proflavine sulphate has been used in this department in the prophylactic treatment of head wounds, including six cases of compound fracture or gunshot wound of the skull, with gratifying results. In five of these six cases solutions of 0.1% proflavine at *p*H 6.3 (made from Boots isoflav tablets) were used freely as irrigating lotions to the exposed brain and skull wounds after débridement had been carried out and before the wounds were closed by primary suture. In the sixth case multiple small penetrating wounds had been caused by the discharge of a shot-gun at close range and several of the pellets had entered the brain. As a thorough débridement was technically impossible the various puncture wounds were treated by a single irrigation with proflavine solution. Only one out of the six patients died, the remainder, including the case of shot-gun wounds, healing by first intention without any signs of wound infection or oedema of the brain. In the fatal case death occurred twelve hours after operation from shock due to multiple injuries to other parts of the body. Histological examination of the brain showed no damage in excess of the trauma inflicted.—We are, etc.,

Nuffield Department of Surgery, Oxford, Feb. 27. DOROTHY S. RUSSELL. MURRAY A. FALCONER.

SIR,—In a recent paper of mine on the prevention of gas-gangrene infections by the local application of sulphonamide compounds, a brief reference was made to some comparative tests undertaken with proflavine. I must apologize if a false impression has been given that I wished to cast doubt upon the use of this compound as a wound-antiseptic. In the few animals which were treated with 1% or 0.1% proflavine the results were approximately equal to those after treatment with sulphathiazole. However, no detailed comparison between proflavine and sulphathiazole was made, partly because this lay outside the intended scope of the investigation and partly because it was understood that sufficient clinical experience (which is the final arbiter) was now available to assess the merits and limitations of the use of proflavine. Dr. Dorothy Russell and Mr. Murray Falconer have kindly permitted me to see their letter describing the six cases treated with this compound. A comparison between a series of human wounds dressed with sulphonamides and a parallel series dressed with proflavine would certainly be most valuable. Such a study, however, would have to be made at a large centre where much material was available.—I am, etc.,

National Institute for Medical Research, London, N.W.3, March 3. F. HAWKING.

Local Application of Sulphonamides

SIR,—In view of the recent work on local sulphonamides, are we not justified in putting into immediate and wide-scale effect some of the known results? Would it not be reasonable for all wounds to be dusted with sulphanilamide powder (or, better still, sulphanilamide 2 parts and sulphathiazole 1 part) before the first-aid dressing is applied? To first-aid kits could be added a modified pepper-pot with a screw cap to cover the perforated end, filled with powder. It would be a matter of moments only for a first-aid man to unscrew the cap and sprinkle the powder on to the wound before applying the first dressing. He need not interfere with the wound and need not contaminate the top of the "pepper-pot" with his fingers.

Dr. F. Hawking (February 22, p. 263) has shown that two hours' delay in applying sulphonamides locally produced fatal results in his animal experiments.

For those cases of wounds which after admission to hospital cannot immediately be taken to the theatre on account of shock or pressure of other cases, insufflation of the wounds with sulphanilamide and sulphathiazole powder as soon as possible appears to be indicated. Early in the period of resuscitation many wounds could have the fine nozzle of an insufflator gently inserted into the depth of the wound and a reasonable amount of powder blown in, without disturbing the patient or interfering with the treatment of shock. One could then leave each patient to take his proper turn in the theatre list, with some certainty that the growth of many virulent organisms would, at any rate, be inhibited.—I am, etc.,

Manor Hospital, Walsall, Feb. 22. E. S. CLAYTON, Medical Superintendent.

A.R.P. Casualties

SIR,—In some recent admissions shock seems to have been far greater than could be accounted for by the nature of the injuries. It appears that until last summer four blankets were considered to be the standard equipment for each stretcher in the ambulance. In some districts, however, two blankets were withdrawn during the summer months, and it appears that these have not been restored for winter service; neither have hot-water bottles been conspicuously in evidence. In some cases I saw the patients shivering with cold.

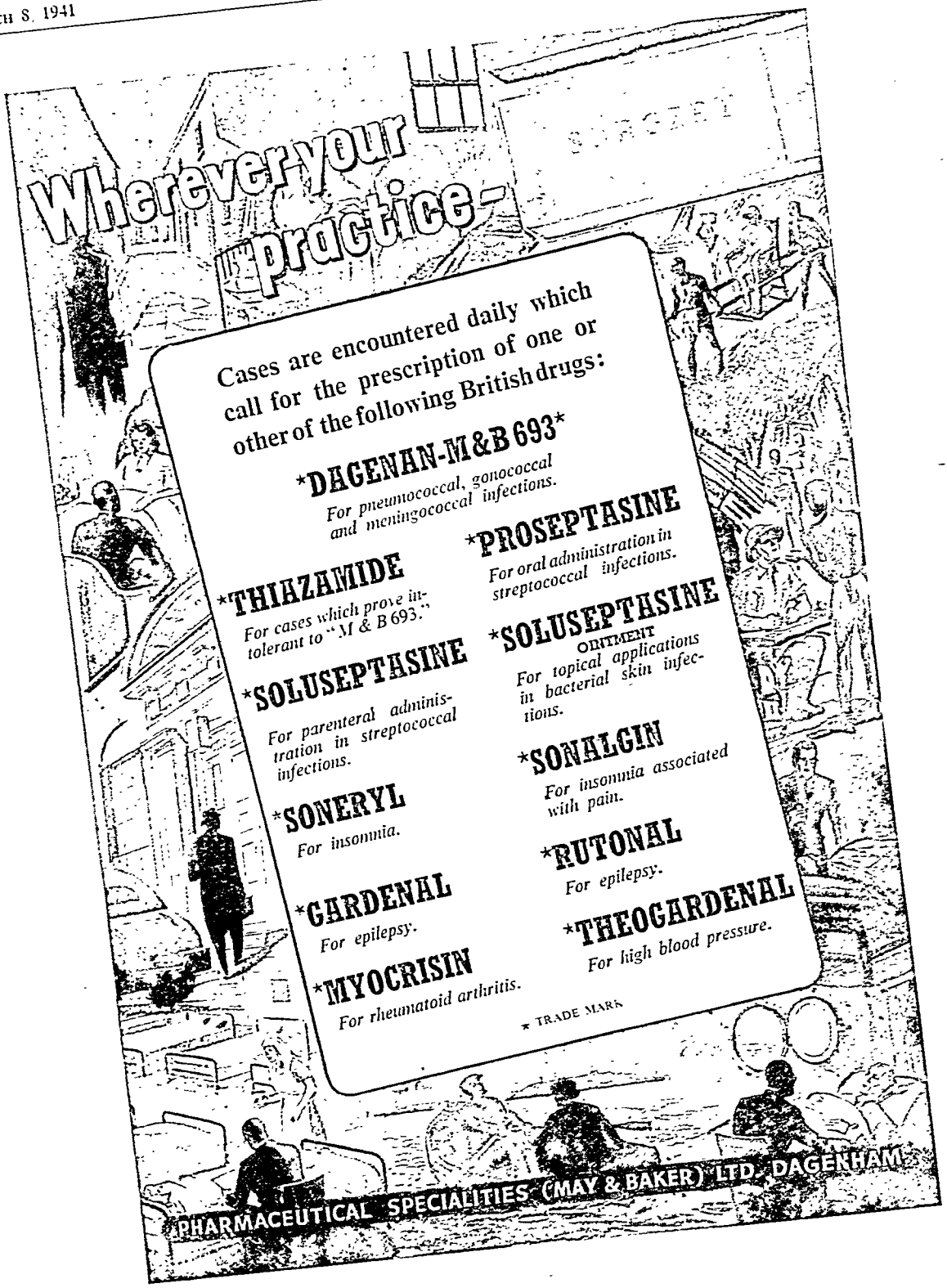
To facilitate quick exchange of blankets on arrival at hospital there should be a standard ruling for all districts and all authorities in this respect. Recent experience indicates that two blankets, however cunningly folded, are insufficient, notably in the case of a large patient, whose body surface loses a correspondingly greater quantity of heat.

It might make for speed and efficiency if local authorities were told to provide a thick felt or stuffed underpad, covered with spongeable material, just fitting and tied to each stretcher in the ambulance; when soiled it could be exchanged at the hospital, as is the case with the blankets. Some of the blankets in use, especially the cotton ones, are more weighty than warm.

Attention to these matters is evidently urgently required.—I am, etc.,

London, W.1, Feb. 24. G. H. COLT.

SIR,—May we submit the following comments on the article by Dr. Margaret Ball and Mr. George Quist. Our comments are based on a personal experience of some eighty air-raid casualties.


Wherever your practice—
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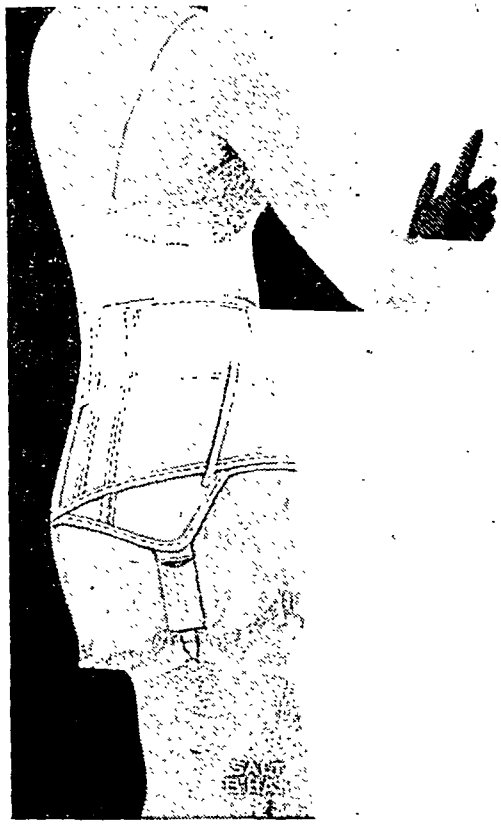
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Our operative technique differed from Ball and Quist's only in the routine use of sulphapyridine powder as a dressing for the excised wound.

We have had no case of gas gangrene. None of the three cases of gas gangrene reported by Ball and Quist had received local sulphonamide treatment, which Hawking (February 22, p. 263) has shown experimentally to be more effective than systemic administration. This is also borne out by the series of cases reported by King (February 15, p. 231) and others.

Ball and Quist do not regard routine x-rays of the limbs as absolutely essential. We have found that in the absence of routine radiographs of the limbs the existence of complications which necessitate the removal of small foreign bodies may be overlooked, and that secondary operations undertaken at a time when infection has become established may then be required. We quote the following case as an example. A man aged 49 had a small penetrating wound in the right calf. This received routine operative treatment, but a subsequent radiograph showed a small bomb fragment lodged in a fracture of the fibula. This fragment required removal later owing to sepsis, and osteomyelitis is now established.

In our series the results of resuscitation treatment, including blood and plasma transfusion, were uniformly good, only one patient dying of shock after admission. It would be interesting to hear which, if either, of these two contrasting results has been the more general experience.—We are, etc.,

W. H. GRAHAM JESSOP.
ARNOLD S. ALDIS.

Cardiff, Feb. 24.

SIR,—The data given by Dr. Margaret Ball and Mr George Quist (February 22, p. 273) are useful and interesting, but there are some further details which many of us would like from a first-aid viewpoint.

How far away was the incident? Was it in a closed or an open space? Was there an awkward or long ambulance journey? Could blast have complicated the shock of these patients? Was any morphia given or other shock treatment attempted at the site of the incident? Was any fluid given by mouth? If so, what? Were the tourniquets complained of applied by trained first-aiders?

I might add that I have tried to crystallize "shock" to my first-aid pupils as "loss, more or less complete, of muscular and nervous tone." They can all grasp the difference in tone of their own muscle when fit and when exhausted.—I am, etc.,

W. F. BENSTED-SMITH.

Devon, Feb. 23.

Calcium Metabolism

SIR,—In the discussion on calcium metabolism in your columns one important point has not been brought out. I refer to the methods of estimation of calcium. The accurate determination of this element in biological material presents some difficulties, especially in the analysis of low-calcium diets. The analyst unaccustomed to this particular estimation may be unaware that the results he is producing are incorrect. Calcium balance experiments are not easy to carry out, as Dr. R. A. McCance remarks, and a carefully planned experiment is as easily ruined in the laboratory as in the ward.

It is possible that much of the conflict in the evidence that appears in medical literature has its origin in experimental or analytical errors which might be obvious if more details were reported.—I am, etc.,

A. B. ANDERSON.

Royal Infirmary, Glasgow, Feb. 25.

SIR,—Regarding Dr. R. A. McCance's article on calcium metabolism (February 22, p. 276), it is curious that what is, in a way, a mass experiment of administering calcium by inhalation has received so little attention. I refer to workers in lime dusts. Fisac (1909) reports that in Spain the workers in quicklime and plaster-of-Paris are immune to tuberculosis, despite the fact that they live in squalid dwellings and are underfed. Hamburger (*Journal*, January 8, 1916) states: "Labourers in limekilns do not get tuberculosis." In a dusty chalk industry in France M. Rénon reported an absence of tuberculosis among the workers, though they were very alcoholic.—I am, etc.,

W. J. BURNS SELKIRK.

Birmingham, Feb. 27.

Control of Scabies

SIR,—I quite agree with Dr. Allan Bigham (February 22, p. 294) that scabies might well be treated in gas *decontamination* stations. This procedure has been adopted in this borough for some weeks past and is working quite satisfactorily. I have notified the general practitioners that if they wish any of their patients suffering from scabies to be treated at the first-aid post centre they should notify me and the matter will be arranged. In this way a number of adults and children are constantly being cleansed, and both doctors and patients appreciate the facilities that have been provided.

I have had no experience with benzyl benzoate therapy, but if this method of treatment is more certain and effective than sulphur ointment the eradication of scabies would be helped by facilities being given for an increased supply of benzyl benzoate.—I am, etc.,

W. F. CORFIELD.
Medical Officer of Health.

Colchester, Feb. 24.

SIR,—I was much interested to read Dr. Allan Bigham's letter on scabies, and I readily approve his suggestions for stamping out the disease.

In general practice in this industrial area in the Midlands I have noted with growing concern the steadily increasing incidence of scabies, and I feel that unless more intensive measures are adopted for its control it may seriously affect the output of employees engaged in work of national importance. I am repeatedly confronted with the young panel patient who is keen to be treated and rid of the pest, thus permitting him to perform his work satisfactorily and enjoy proper rest, but am further informed that other members of the family have the same disease, and for reasons of financial need (not enjoying the benefits of free treatment) or perhaps sheer apathy remain untreated, and so form a source of infection to an ever-increasing circle of contacts.

It would appear, therefore, that stricter control is required, and I venture to suggest that (1) scabies should be a notifiable disease, and (2) local authorities should provide facilities for free treatment as in the case of other infectious diseases.—I am, etc.,

J. BORRIE HARRIS.

Tipton, Staffs, Feb 23

Chicken-pox with Bell's Palsy

SIR,—In your issue of February 15 (pp. 234 and 236) were two most interesting articles on "Paresis following Herpes Zoster" (Drs. A. Barham Carter and John B. W. Dunlop) and "Bell's Palsy and Herpes Zoster" (Major John D. Spillane), which brought to my mind a case of chicken-pox with Bell's palsy which occurred in my practice about ten years ago. The patient was a healthy girl of 11 years who had the severest attack of chicken-pox I have ever seen; the rash was very widespread, particularly on the face, and constitutional disturbance was severe. On the fifth day of the illness, while she was still febrile, there appeared a complete peripheral facial palsy. The well-known association between chicken-pox and herpes zoster supplied an explanation, though it had not been my experience (then) to see a case of motor-nerve involvement in a case of the latter. The paresis cleared up completely in about six weeks.

Since this experience I have always felt that the typical Bell's palsy must be due to a virus akin to that of herpes zoster, as it surely would be a much commoner condition if chill were the only causative factor, and this hypothesis, I note with interest, is supported by Major Spillane in his article.—I am, etc.,

A. R. C. DOORLY.

Surbiton, Feb. 25

Muscular Lesions in Somatic Pain

SIR,—The observations of Mr. Martin Button (August 10, 1940, p. 183) upon muscular rheumatism, and of those who took part in the subsequent correspondence, have been abundantly confirmed by my experiences in general practice during the past two and a half years. Since the publication of the earliest work of Sir Thomas Lewis and Mr. J. H. Kellgren (*Journal*, February 12, 1938, pp. 321 and 325) I have been ready to give this method a trial in all cases of somatic pain, and many

apparently of visceral origin. The general practitioner is very conveniently situated with a view to carrying out important researches upon somatic pain, for he constantly sees large numbers of these cases, and he is provided with an instrument of great scientific precision in local anaesthesia.

So regularly does a persistent search reveal a muscular lesion that I have come to regard this as the cause of any case of obscure pain until proved otherwise. Intramuscular nodules are found in many cases of headache, in a number of cases of painful shoulder, and in the majority with "brachial neuritis." They occur in all cases of pleurodynia, and in many cases which resemble angina pectoris. Muscular lesions can simulate the symptoms in every kind of visceral disease, and they can usually be discovered in lumbago, "sacro-iliac disease," and sciatica. They can be found in adjacent muscles in association with painful knees, and they occur with almost regular frequency in painful feet. Their frequency is unbelievable to one who has not become familiar with the idea of their existence. They have certain sites of election where they will be found with almost monotonous regularity. These situations are tender in the normal subject, and are the site of soreness when an untrained muscle becomes "stiff" from fatigue. These situations are:

Symptom	*Situation*
Headache	Nuchal muscles at about the level of the sixth cervical vertebra. (Cyriax, *British Medical Journal*, 1938, 1, 1367.)
Shoulder pain	Anterior border of trapezius in mid-clavicular line.
Pain in forearm and hand	Extensor muscles just below external epicondyle.
Pleurodynia	Edge of erector spinae.
Lumbago and "sacro-iliac strain"	Edge of erector spinae; more commonly in fibres of origin of gluteus maximus, just outside posterior superior spine. (This spot was described by Souttar in 1923.)
Abdominal visceral disease	Same as for lumbar pain.
Sciatica	Lower half of gluteal mass.
Painful knees	Region of adductor tubercle: upper ends of calf muscles. (Kellgren, *Clinical Science*, December, 1939.)
Painful feet	Plantar surface of first metatarsal; deep situation in sole near scaphoid.

The rectus abdominis should be carefully examined when abdominal discomfort is prominent. Nodules may occur in any other muscles.

The reality of this condition is gradually coming to gain recognition, as shown by the correspondence in your columns, and by the recent observations of Copeman and Burt (*Post-graduate Medical Journal*, September, 1940) and of Harman and Young (*Lancet*, June 22, 1940). J. B. Mennell has for years been writing on painful deposits in muscles, to which, he says, pain can often be solely attributed. The conception of neuritis should now be allowed to lapse into oblivion. In most (probably all) cases pain which shoots down a limb is not due to a nervous but to a muscular lesion. It is probable also that the orthodox views of many other common ailments will come to be modified in the light of these researches.

Copeman and Burt, among others, complain that their results are inconsistent; that they cannot predict which cases will be cured and in which the pain will recur. This also was my experience in the earlier stages of my observations, and indeed often enough at present. Many failures were due to my inability to distinguish between the referred tenderness and the tenderness of the lesion itself. The referred pain and tenderness tend to be located in the region of joints, and bony points beneath the skin may be acutely tender. It is disastrous to inject these points, though some immediate improvement will follow. The true lesion should be sought in adjacent muscle. Similarly, tendons, periosteum, and joint capsules should not be infiltrated; their tenderness will be found to vanish as if by magic when the true lesion is anaesthetized.

The discovery by Kellgren that a localized lesion can cause widely distributed referred pain and tenderness has opened up a large new field in which symptoms encountered every day attain a new significance. We are thus provided with the key to the understanding of many rheumatic manifestations, which are proved to have a common origin. I am reminded of the statement of Pennington (*British Journal of Rheumatism*, 1939, p. 3) that fibrositis, lumbago, sciatica, and neuritis are all local names for a probably identical process.

The researches I have mentioned will in the long run bring about an entirely new conception of the origin of pain. Hitherto we have been obsessed with nerves; pain is said to be due always to pressure on nerves. The knowledge that widespread tenderness will disappear on anaesthetization of a single painful spot should lead us to discard the views accepted at present, and to consult the work of Lewis upon nocifensor nerves (*British Medical Journal*, 1937, **1**, 431 and 491). An area of injury to tissue becomes surrounded by a spreading zone of hyperalgesia. This is brought about by a reflex through the nocifensor nervous system. Lewis likens the appearance of hyperalgesia to a process of secretion; injury to the tissues causes a nervous reflex by means of which a substance is liberated from the cells which lowers the threshold of pain nerve-endings. Similarly with a painful muscular lesion; its presence causes a continued stimulation of the nocifensor network immediately surrounding the lesion, and sometimes in distant areas. Further researches upon this network will no doubt demonstrate the linking up of the various somatic tissues and viscera in a unity whose closeness has not yet been generally suspected.—I am, etc.,

Bunbury, Western Australia, Dec. 3, 1940. MICHAEL KELLY.

Malignant Measles

SIR,—In view of the fact that "black" or malignant measles is of such rarity that a man of the late Claude Ker's wide experience could write that he had never seen an instance, the following case may be worth putting on record.

A child aged 9 months was brought to my surgery at 2.30 p.m., having vomited about half an hour previously. It was pale, with a temperature of 100.4° F. and a slightly increased respiration rate but no other physical signs, and the skin showed no suggestion of a rash. I was, however, impressed by the apathy of the child, indicating a degree of illness which the mother clearly did not appreciate, for I had to insist firmly that the child must be taken home at once and put to bed.

I was called to see it again at 2 a.m. the following morning. I found it *in extremis*; respirations rapid and shallow, lips cyanosed, and swallowing reflex absent. Its face, trunk, and limbs were covered with a measles rash which was deep purple in colour. Some of the spots had petechial centres and there were scattered purpuric areas up to half an inch in diameter. The child died within an hour and just over twelve hours after being first seen. The mother insists that until the onset of vomiting "there was nothing wrong with her."

The fulminating character of the illness, the nature of the rash, and the fact that an epidemic of measles was in progress in the town left little doubt as to the diagnosis. It has been stated that the disease should be differentiated from small-pox. In this instance the rash bore no resemblance to that of variola, of which I have had the opportunity of seeing several examples, and the child had been vaccinated.—I am, etc.,

Tiverton, Devon, Feb. 13. AUDREY Z. BAKER.

Intramuscular Quinine for Malaria

SIR,—Medical officers who have come to this country in the last few years have been imbued with the idea that intramuscular injections of quinine are fraught with danger. The quickest and most efficient and comfortable method of treating malaria is thereby denied to many patients. The danger of abscess formation is negligible if the precaution is taken to empty the needle of quinine by a shot of air from the syringe before it is withdrawn. If this is not done a track of quinine will be left when the needle is withdrawn. The area of injection should, of course, be massaged well.

In Kano practically everyone is infected with malaria during the rains. Three daily intramuscular injections of quinine grains 5 are found to cure the acute symptoms of malaria in all but the most exceptional cases. Quinine is afterwards given by the mouth in small doses. This is the routine in this native hospital of 300 beds, partly on account of its cheapness. The injection solution is made up in the dispensary, 5 grains of quinine bihydrochloride to 1 c.cm. of

water. The needles are regularly sharpened, and the injection, if given into the gluteus medius, is usually painless. The patient lies on his side and his uppermost leg is fully flexed. The upper border of the gluteus maximus is usually seen and the injection made at that level. This is about 2½ to 3 inches below and behind the anterior superior iliac spine.

I have never seen abortion caused by an injection of quinine even in those in whom a dose of 5 grains of quinine by the mouth causes pain in the uterus and bleeding.

Intravenous quinine should be reserved for cases of cerebral malaria. Europeans have an attack of syncope and sometimes a feeling of impending death just after the intravenous injection which can be most unpleasant. Africans do not suffer in this way, but owing to its rapid excretion it is not so efficacious as the intramuscular route.

Europeans in Nigeria who take prophylactic quinine while not having any temperature, often suffer from general lassitude, a heavy head, and occasional headaches. One injection of quinine is usually found sufficient to remove these and other malaria symptoms. Personally I submit to an intramuscular injection of quinine rather than suffer the unpleasant effects of large doses of quinine by the mouth.

Atebrin (quinacrine), while being very valuable in certain cases, particularly blackwater fever, does not suit all patients, and the relapse rate appears to be high.—I am, etc.,

Kano, Nigeria, Dec. 12. R. N. HALL.

Cyclical Mucosal Ulceration

SIR,—I was interested to read the article on cyclical mucosal ulceration by Dr. M. H. Pappworth (February 22, p. 271). It would be interesting to know whether an eosinophil count was made, and, if so, whether it was more than normal. One asks this question as so many conditions which occur in cycles in some patients have an allergic origin.—I am, etc.,

Liverpool, Feb. 24. J. BERNSTEIN.

Shelter Policy

SIR,—It is stated that 1,502 deaths resulted in January, 1941, from enemy air raids, and these will continue steadily if things remain as they are. Is the B.M.A. and are doctors generally, whose objectives are the preservation of life and health, satisfied that all is being done, as far as can be, to lessen this holocaust of our courageous fellow countrymen and women? If not, our primary duty is to make a formidable demand at once to the Government and to the Minister of Home Security to take all steps, as far as is humanly possible, to prevent this wounding and suffering in our home front line. Who of us will volunteer to do so?

In support (1) I refer to the *Journal* of February 15 (p. 250), which records a conference of the Association of Architects, Surveyors, and Technical Assistants, of the National A.R.P. Co-ordinating Committee, of various local authorities, and of doctors, which urged that a higher standard of protection against high explosives and a better shelter policy be introduced (without further departmental delays). Dr. Joan McMichael advocated, from a medical and safety aspect, the maximum degree of safety with a minimum of risk of disease, as is afforded by "two-stage" shelters (Haldane), because they could be strengthened so as to render them proof against medium (and even higher) calibre bombs. It is true that the Regional Commissioner for London, in charge of the shelter "problem," advocates the use of Anderson shelters, and Lord Horder believes in "domestic" shelters, but this Governmental viewpoint of "dispersal" is certainly not shared by all experts and is not in accordance with recent tragic experiences.

Again, (2) recognizing the vulnerability and repeated bombings of London and provincial hospitals, with losses of patients', nurses', and doctors' lives, bomb-proof hospitals should be provided for the (comparatively small) number of casualties and sick persons who cannot be moved out of the danger zone. For those casualties that can be moved suitable ferroconcrete buildings should be requisitioned along wide and strategic roads and their basements adapted as comparatively safe clearing stations, other patients being removed outside the danger zone (Socialist Medical Association leaflet, 33, Murray Road, Northwood, Middlesex). Many of the flimsy structures that have been and are being provided as shelters are potential death-traps.

These two gaps (1 and 2) in our home defences are a direct help to Hitler, and are comparable to the disastrous military events which led up to Dunkirk. How long will those of the medical profession, who mean to win this war, allow this "slaughter of the innocents" to continue without a collective challenge?—I am, etc.,

Woking, Feb. 24. F. G. BUSHNELL, M.D., Major R.A.M.C., T.F. (retired).

Supplementing the Dietary

SIR,—In the last war many doctors had notices in their surgeries exhorting their patients to "Eat less bread," and it seems to me that the time is now ripe for other notices referring to the present food situation.

Possibly "Eat more potatoes and less bread," "Carrots are *good for you*," and suchlike might be useful, but the outstanding requirement at the moment is some instruction about supplementing the foods which are in short supply—the fats and the proteins. Eggs might be recommended for their fat content, but unfortunately they go in with the scarcer proteins, meat, cheese, and fish. Milk also is not so plentiful that it can be used largely in additional amounts. Some recommendation should be made of the next best foods for their protein content—peas, beans, lentils, and oatmeal. A soup made of the pulses would be excellent, but the need that most folk feel is for a recipe for a pea or lentil soup which is palatable without the unobtainable ham bone in it. The vegetarians have been making it for years, and if the Ministry or the B.M.A. could produce posters containing practical advice in plain language, not in the highbrow sentences which sometimes adorn the hoardings of one or another of the Ministries, there is little doubt that doctors would put them up in their waiting-rooms. The patients might or might not be impressed by a blessing from the medical profession, but they would in any case have to sit and stare at the poster for a certain amount of time, and some of it would sink in.

It might be considered advisable to refer to the "Scottish ploughman's diet" recently mentioned in the *Journal* (January 11, p. 63); but the motive should be to point out that there is plenty of food of all necessary kinds if only a little trouble is taken. A short note might be added about use of vitamins in (if necessary) capsule form, one a day. May we hope for some action?—I am, etc.,

Leigh, Lancs., Feb. 24. JOSEPH JONES, M.D.

Medical Planning Commission

SIR,—As one of the younger members of the profession I should like to add my opinion of the B.M.A. Planning Commission and the future of medicine. I think that the chief reason why the Commission has met with so much criticism is the secrecy with which it was appointed without authority from the profession as a whole. For many reasons the Commission is not representative and does not command the support of a large body of the profession. It would seem, furthermore, from the Prime Minister's statement in the House of Commons, that the Government is not going to put much weight on the findings of the Commission. It seems to me, therefore, that the Commission is going to waste its time, and that the whole Commission, as appointed by the B.M.A., should be dropped.

I do feel, however, that the B.M.A. has done the right thing in taking the lead and suggesting that now is the time to plan for the future. No man can say how long the war will last, and it would be wrong to wait for the end of the war before beginning what will necessarily be lengthy deliberations on the future of medicine. I suggest, therefore, that the Government be strongly urged to appoint a small but representative Royal Commission, representative of every branch of the profession—of general practice in country, town, and colliery, of consulting medicine, research, teaching and public services, and especially of young and old, male and female.

Before it can hope to plan for the future the Commission must find out what is wrong with the medicine of the present. A profitable approach to the problem would be a questionary sent out to every British member of the profession, whether

at home or in the Forces, to ask (1) what from his experience he considers to be wrong with the present medical service of the country; (2) what suggestions he has to improve matters. The inclusion of the Forces in the questionary answers the criticism that this is the wrong time to have a Commission because so many are serving over-seas. A questionary would allow everyone to play his part in planning for the future. From the result of this investigation a constructive scheme for the future could be elaborated.

When one considers some of the faults of the present system some of the requirements of such a service immediately spring to one's mind:

1. The pooling of hospital beds. The present system, in which the voluntary hospital has a waiting list of anything up to five years while the municipal hospital in the same city has none, is manifestly absurd. Furthermore, in many teaching centres there is a shortage of clinical material for teaching in the voluntary hospital, with consequent overcrowding by students, whereas there is an abundance of material in the municipal hospital to which the students are not allowed access. I believe that the Nuffield Provincial Hospitals Trust is at present concerning itself with some of these problems.

2. A fairer scheme for admission to hospital. Selection of cases for admission from the waiting list should be governed by the urgency of the case and not by the payment of a consultation fee to a member of the hospital staff. In one hospital I know a patient with an inguinal hernia will wait two years for admission as an "ordinary case" and not more than a week if he has paid his three guineas.

3. Better pay for some house officers, for all research workers, registrars, and members of the nursing profession. It is absurd that some house officers and nurses, with all their responsibility for the lives of their patients, should be paid less than the maids, whose responsibility is to scrub the floor or tend the potato peeler. There must be many good young men who are deterred from attempting to climb up the tree to the honorary staff for fear of falling by the wayside through financial difficulty, especially when they are well up the tree and in the perilous stage without support when they first become junior members of the honorary staff.

4. The more even distribution of work in general practice. There is no valid reason why the general practitioner in a wealthy practice should earn much more money than a man doing three times more work in a depressed area.

5. Improvement of the standard of medicine. There should be compulsory "internship" for at least six months after qualification before going into practice, and facilities for all practitioners to keep up to date, with compulsory attendance at refresher courses at frequent intervals.

6. A solution of the financial difficulties which trouble the middle-class patient and the poor non-panel patient in outlying parts of the country in obtaining treatment. Only a few weeks ago I inquired my way at a farm so remote that the nearest doctor's fee was £1 per visit.

7. Better facilities for laboratory investigations at a reasonable cost, especially in country districts.

8. Better system of promotion. Promotion in any of the branches of the service should depend on ability, experience, and the degree of responsibility attached to the post, rather than on graft, nepotism, or merely on age or duration of service.

I feel that a full-time State Medical Service is the only one which can fulfil these and many other requirements. I do not for a moment hold with the argument advanced, especially by some senior physicians, that such a service would abolish initiative, individuality, or ambition. With the system of promotion mentioned the reverse would be the case. Space will not permit me to give my ideas about the financing of such a scheme, but I do not think that it presents great difficulties. Now is the time, when the future of medicine is in the melting pot, to think and plan for the future. It will be the profession's fault if the new State service after the war is a bad one, with the present evils unremedied.—I am, etc.,

Oxford, Feb. 24. RONALD S. ILLINGWORTH.

SIR,—In his letter (February 22, p. 295) Dr. C. E. S. Flemming asks: "Are we not giving too much importance to proportionate representation?" My answer is "No," if the object is to secure the full confidence of all sections. He then suggests that the function of the Commission is merely to take evidence and act as judge and jury. If this is in the nature of a trial, then under British usage the jury must be composed of one's peers, and 26,000 out of 36,000 doctors in Great Britain are general practitioners. He goes on to state: "What we want is men of understanding." Quite so—men understanding the difficulties and needs of general practice. We don't want "the opportunity of discussing the proposals" later on, but of taking a major part in formulating the proposals, so far as they affect general practice—and while writing this I am not forgetting that other questions of great importance, not peculiar to general practice, must also be considered. Dr. Flemming himself recognizes that the difficulties and needs of general practice must form a very important part of the Commission's work, yet he seems content to allow them to rest in the hands of a preponderant majority of consultants and public health officials, few of whom can have felt the pinch and the need for remedy. Take, for instance, his demand for beds in hospitals. Is he satisfied to leave a decision on this question in the hands of a majority whose life-work must incline them to the belief that no such step is necessary or desirable?

With the rest of Dr. Flemming's letter I am in complete agreement, but I prefer that the decisions on the questions he raises should be made by men who know the difficulties and needs personally, and not only by hearsay.—I am, etc.,

Ashover, Feb. 24. H. W. POOLER.

Dyspepsia in the Army

SIR,—In the *Journal* of March 1 Major Spillane criticizes the findings of our interim report on dyspepsia in the Army, especially our statistics relating to the high incidence of organic disease. Major Spillane will find a detailed answer to this criticism in our letter to the *Lancet* of February 8 in reply to Prof. Hartfall. There are, however, certain points which we should like to stress.

First, our investigation was primarily concerned with troops invalided home from the B.E.F. in the early days of the war. Secondly, we found a great tendency in the Army hospitals to label dyspeptic cases as functional ones, even, at times, in the face of most conclusive evidence to the contrary. Thirdly, we certainly agree that the dyspepsia problem at the present time may well be very different from that in the early days of the war. Finally, we must put forward a plea for the most careful diagnosis of the individual dyspeptic; and in the difficult or obscure case for a diagnosis based on a summation of all the evidence. Dyspepsia due to organic conditions such as ulceration may render a man totally unfit to be a soldier. Functional dyspepsia may or may not render a man unfit for service, but this diagnosis can only be scientifically and practically justified when organic disease has been first excluded by every possible means.

Major Spillane criticizes our statement that "among those investigated there was little evidence of minor dyspepsia." This statement did not appear in our original report to the Royal College of Physicians of London. It was inserted in our published report after discussion with the Army authorities and at their request. We could not, however, possibly object to its inclusion as a positive statement of fact, as it was in entire agreement with our experience in investigating B.E.F. and local sick in the early stages of the war. Whether or not such a statement could still be made of the dyspepsia problem is entirely outside the scope of our inquiry.

On the basis of our experience we are satisfied that the most careful investigation of the dyspepsia patient can be justified on the grounds of Army efficiency, public expenditure, and the health of the community.—We are, etc.,

REGINALD T. PAYNE.
London, March 3. CHARLES NEWMAN.

The forty-ninth semi-annual list (May 1 to November 1, 1940) of the publications of the staff of the Rockefeller Institute for Medical Research has been received. Copies of these lists will be posted regularly to those who send requests to the Publication Office, Rockefeller Institute for Medical Research, York Avenue and 66th Street, New York, N.Y.

Obituary

SIR FREDERICK BANTING, K.B.E., M.C., F.R.S.

LL.D., D.Sc., F.R.C.P., F.R.C.S.

As briefly announced in last week's issue, Sir Frederick Banting lost his life in an aeroplane accident in Newfoundland while on a mission concerned with research into medical aspects of flying.

Frederick Grant Banting was born on his father's farm at Alliston, Ontario, on November 4, 1891, and from Victoria College, Toronto, went to study medicine at the University of Toronto, qualifying in 1916. While serving in France with the Canadian Expeditionary Force he was severely wounded in one arm at Cambrai and invalided to England, and was awarded the Military Cross for his gallantry. In England he took the M.R.C.S. and L.R.C.P. diplomas, and returned to Canada in 1919 to become resident surgeon at the Hospital for Sick Children, Toronto. He then for two years combined practice at Toronto, Canada, with the work of a part-time assistant in physiology at the Western Hospital. On May 16, 1921, he began research on the internal secretion of the pancreas at Toronto, and was appointed lecturer in pharmacology at the University; it was the turning point of his career, for these were the experiments in collaboration with the late Prof. J. J. R. Macleod and Dr. C. H. Best which led to the discovery of insulin. The first inkling given to this country that Banting and Best were on the eve of an epoch-making pronouncement was an annotation in the *British Medical Journal* of July 22, 1922, headed "The Control of Glycosuria by the Islets of Langerhans," which referred to a preliminary paper published early that year in the *Journal of Laboratory and Clinical Medicine*. In these columns on November 4, 1922, J. J. R. Macleod gave to the British medical profession a summary of the work carried out during the past two years in the Toronto Medical School. His paper, entitled "Insulin and Diabetes: A General Statement of the Physiological and Therapeutic Effects of Insulin," was written at the invitation of the Editor, Dawson Williams, who had close contacts with medical science in Canada and had quickly recognized the great importance of this work at Toronto. Thenceforward Banting's name was a household word, and honour after honour came to him. He was awarded the Starr gold medal for the D.Sc. of Toronto in 1922, and in the following year was made Professor of Medical Research there; soon afterwards he received jointly with Macleod the Nobel prize for medicine, and was granted an annuity by the Canadian Government so that he might pursue his researches. He received in turn the Scott medal and the Favelle medal and Fellowship of the Royal Society of Canada, the Cameron prize of the University of Edinburgh, and the gold medal of the Apothecaries Society of London. He was an honorary doctor of a number of universities, the Royal College of Surgeons of England made him an honorary Fellow in 1930, he was elected a Fellow of the Royal Society in 1935, and the Royal College of Physicians of London made him a Fellow under By-law XXXIX (*b*) in 1936. He was created K.B.E. in 1934.



In the early months of the present war Sir Frederick Banting was in England attached to the Canadian Forces, with a view to special research in the Canadian Hospital here, but he returned to Canada to undertake investigations into the medical aspects of aeronautics as a member of the Technical and Scientific Development Committee set up at Ottawa. The Canadian Prime Minister told the House of Commons at Ottawa that Sir Frederick at the time of the aeroplane crash was proceeding to Britain on a mission of high national and scientific importance.

SIR HENRY DALE, P.R.S., writes:

It is sad to think that Banting has gone from us in what should have been still his scientific prime, though the dramatic end is not without its fitness to a career of research which had an unusual tinge of romance. The death of Keith Lucas in a flying accident in 1916 comes to mind, but with a suggestion of contrast more than of analogy. Lucas, at the age of 37, by work of increasing depth and brilliance over a decade, had given new form and substance to a whole range of fundamental physiology; to those who knew, he was already a master, but to the world at large his work meant nothing. Banting, who has died in his fiftieth year, was already a world celebrity in his earliest thirties. Rightly, as I think, the world gave him the biggest share of the credit for a great discovery, which brought about what is still the most dramatically sudden change in the aspect of a disease within living memory. Banting, however, had but little preparation for such an achievement, and his direct share in its development was relatively brief.

The year 1915 had found him still a medical student, and he served in France as a combatant, being wounded so severely as nearly to lose an arm, before he completed his qualification. By 1921, when the vision came to him, he seemed to be settled in medical practice in London, Ontario, with only a spare-time contact with the Department of Physiology there. The idea which had set his imagination aflame was not, in fact, a completely new one. Even its basal assumption that the action of trypsin had been responsible for frustrating earlier attempts to extract the anti-diabetic hormone from the pancreas has not survived the progress of knowledge; but this progress itself became possible only as a result of Banting's enterprise and determination. Carbohydrate physiology, in the thirty years following Minkowski's fundamental discovery, had left a trail strewn with the wreckage of attempts, many by workers of ripe experience, to extract the supposed hormone from the pancreas; and this was the problem which Banting, with no previous experience at all, was eager to tackle anew. When Macleod was asked to give him room for the attempt in the Toronto laboratory it would be natural for him to warn Banting, as he is said to have done, that this dismal history left little hope of success. It is more pertinent, I think, to remember that Macleod did, in any case, give Banting the chance of a trial, and, more important still, that he advised him to accept collaboration with a younger man, Charles Best, recently schooled under Macleod in methods of determining blood sugar and analysing respiratory gases. So these two young men, the one a surgeon with an insistent idea, the other still a student, but bringing essential technique to the joint equipment, embarked bravely on an enterprise which, through a Canadian summer, was to make demands on all their reserves of determination, conviction, and personal devotion. By dint of all these they succeeded in a few months in demonstrating directly that the hormone insulin had real existence, and that it could

be extracted in relatively permanent form, under appropriate conditions.

This was the first essential step. When once the possibility of extracting insulin had been established, other workers, first in the Toronto laboratories, led and organized by Macleod, and soon in many laboratories in many countries, contributed to the knowledge of its properties and to the discovery of methods for its purification. Such studies led eventually, and with a rapidity which would have seemed incredible when its existence was first demonstrated, and which still seems astonishing in retrospect, to the crystallization of pure insulin as a metallic salt. With all this further development, however, Banting had little concern. As soon as its partial purification had made clinical trials possible, he had centred his interest on the practical application of insulin in the treatment of diabetes; his Nobel Lecture in 1925 reviewed the clinical results obtained with it to that date. It was rather noteworthy, indeed, how soon he seemed ready to leave to others the further investigation of the properties of insulin and the mode of its action, and to direct his own researches to other objectives. It may be suspected that more than one influence was concerned in this decision. Banting would certainly be aware that such further developments required a fundamental equipment, especially on the chemical side, which he had had no chance of acquiring. He had shown, thus early in life, what he could do by natural insight in alliance with an iron determination, and without any normal apprenticeship in research. The best reward, from his point of view, would probably have been an opportunity to make good such defects of equipment by some years of quiet and disciplined study in the world's most productive centres of research, and then to return to researches chosen for himself in the light of the wider experience. Conditions, in any case, conspired to make such an arrangement difficult, or impossible. No other medical discovery in living memory has so caught the public interest as the discovery of insulin; and Banting, in particular, soon found himself, to his embarrassment, a mark for popular enthusiasm and excited expectation, in Canada first, and later in the world at large. Money was freely forthcoming, and it would have been difficult for those in authority to avoid founding a Banting Institute for Medical Research, with a Research Chair for himself as its director, or for Banting to refuse such a flattering opportunity. The whole atmosphere of haste and exaltation, however, could not fail to be detrimental. In spite of all pleas for patience and caution from those who were soberly concerned for Banting's future and for his further value to medical research, he had become a public figure; everything concerning him was "news," and the world at large had been taught what to expect. Every few months a new rumour was set afloat in the popular press, attributing some fresh discovery to Banting. I remember being asked myself, over the telephone, whether it was likely that he had discovered a cure for metabolism. His comings and goings were chronicled like those of any film-star.

Even a research worker of long experience and established repute would have found himself inhibited by such an atmosphere. When half the world is agape for a miracle it takes unusual courage to offer it the results of some sound and necessary but unexciting piece of spadework. The matter for surprise is, not that Banting should have seemed for a time to be somewhat embarrassed, but that he should, in the end, have been so little deflected from the proper use of the opportunity which had been given to him. For a few years, indeed, he seemed to feel a constraint towards problems of the kind which popular rumour expected him to solve. Before long, however, he had settled down to a good and varied programme of important but relatively long-range researches, gathering round him a group of collaborators whose training could supplement at different points what was lacking in his own. There was no further discovery like that of insulin, but he and his group did work of substantial and permanent value, for example, on the difficult problem of silicosis, which was a matter of growing concern to the mining industry of Canada.

Whenever I met Banting in these more recent years, before the war broke out, I was impressed not only, as always, by his native keenness and alert intelligence, but by his steadily maturing judgment, and by the essential modesty and quiet firmness of his character. It is idle to speculate as to what he might have achieved if he had lived into a further period of normal activity. The war diverted him, like others, to abnormal duties. A deep glow of patriotic devotion to the British Empire and to Canada was always a central motive with him, and I think that he would have been content if he had known that death on national duty was before him. Apart from the relief and the new prospect of useful life which insulin has given to unnumbered sufferers from diabetes, it is a commonplace that its discovery has had a revolutionary effect on the progress of knowledge concerning the nature of normal carbohydrate metabolism. Perhaps it is not so generally recognized how much wider its influence has been. In 1921 only two relatively simple and stable hormones, adrenaline and thyroxine, had been chemically isolated. Secretin and the post-pituitary hormones, being thermostable and of comparatively small molecular dimensions, had been obtained in extracts, but attempts at their further isolation had ended in discouragement. For the rest, the endocrine function of the other ductless glands was itself little more than a deduction from the results of extirpation and grafting. Their hormones, it was supposed, might be too complex and unstable to be handled, or they might be secreted as fast as they were formed, without accumulation of a store which could yield an active extract. The possibility of progress towards their isolation and chemical study seemed depressingly remote. The separation of insulin from the pancreas was not only an achievement in itself; it had an immense effect of encouragement to workers over the whole field of endocrinology. The whole position has since been transformed at a rate which would have seemed incredible in 1921. Other previously hopeless conditions of endocrine deficiency have been brought under successful treatment, and a number of hormones whose very existence was then a matter of inference have now been not only isolated but even made by artificial synthesis. In paying our tribute to the memory of Frederick Banting, for ever to be associated with the discovery of insulin, it seems fitting that we should remember also the stimulating influence of that discovery on so much that has followed.

[The photograph reproduced is by Bassano, Ltd., London.]

H. S. BEADLES, M.R.C.S., L.R.C.P.

The news of the death of Dr. H. S. Beadles, which took place at Romford on February 23 after a long illness, will be received with regret by a wide circle of British Medical Association members, not only in his own locality—London over the Essex border—but throughout the Metropolitan Counties Branch.

Harold Shatford Beadles, the son of a general practitioner, was born in 1870, and received his medical education at University College and Hospital, London. After taking the

Conjoint diplomas in 1893 he gained some experience as an assistant, and then, in 1896, acquired a large practice in Barking Road, which became larger as the district grew to realize what a careful and conscientious practitioner he was. He was also appointed a factory surgeon under the Home Office for the important industrial area in which his practice was situated, and was entrusted by that Department with many responsible duties over a period of twenty-five years.

When the National Health Insurance Act came into operation in 1913 Beadles found his most fruitful field of service for the profession and the public alike. From the beginning he was a member of the West Ham Insurance and Panel Committees, and his thorough knowledge of the Act and Regulations made his advice of great value. To him it was due in large degree that West Ham became one of the best administered insurance areas in England. Failing health compelled him to retire from active practice in 1922, but he retained his membership of the Insurance Committee and passed its chair. He also continued to take his full share in the divisional and central work of the British Medical Association.

His first appearance as a representative was in 1913, and for many years thereafter he was a well-known figure at the Annual Representative Meetings, and an occasional, always matter-of-fact, participant in its debates. He became a member of the Council in 1919, and, with an interval of one year, so remained until 1934. The number of central committees and subcommittees on which he served was above twenty. His longest term, extending from 1920 to 1934, was on the Insurance Acts Committee, and he was a member of the Medico-Political Committee for about the same period. On the Organization Committee he served for nine years, specially interesting himself in Association work for medical students. His work for his Division was equally noteworthy. For many years Stratford meant Beadles, and Beadles meant Stratford. After the last war, at a time when the reorganization of medical services was very much in the air, he induced Lord Dawson of Penn to address the Stratford practitioners and kept the debate going until after midnight. He was honorary secretary of the Division from 1917 to 1933. In 1929 he was elected to the chair of the Metropolitan Counties Branch, of which he had for several years been treasurer.

One of the hardest of workers, Beadles managed to convey an impression of casualness and nonchalance. A man as well versed in medical politics as any man of his time, especially in the technicalities of health insurance, he was content to be just a member of committees, never striving for the limelight. He was a man who needed knowing. Thirty years of close acquaintance with hard industrial life on the east side of London takes the frills away from a man, but his intimates knew him as a "jolly good fellow," and the fact that he was one of the two or three who arranged year after year that lively function, the dinner which followed the Annual Panel Conference, speaks for his social gifts. During the last six years Headquarters had scarcely seen him: the handicap of ill-health proved too much for him.

Dr. LESLEY MAUDE CAMPBELL PROBYN was killed when a London air-raid shelter of which she had medical charge was hit by a heavy bomb one night in February. She was educated at University College, London, and Charing Cross Hospital, and qualified M.R.C.S., L.R.C.P. in 1926. She was in practice in London and had filled the post of second house anaesthetist at Charing Cross Hospital. She had spent every night since the heavy raids on London began touring the many shelters in the district. Dr. Lesley Probyn joined the British Medical Association in 1928. She has died serving her country just as much as if she had been killed in action.

We record with regret the death on February 9, at a nursing home at Torquay, of Dr. ARTHUR JOHN WHITING, consulting physician to the Prince of Wales's General Hospital, Tottenham, and formerly dean of the North-East London Postgraduate College. He was born at Beverley, Yorks, on March 16, 1865, and studied medicine at the University of Edinburgh, graduating M.B., C.M. in 1889 and winning a gold medal at the M.D. examination in 1892, after which he served for a time as assistant to the professors of physiology and of clinical medicine. At Edinburgh he won the Murchison scholarship in clinical medicine and the Goodsir prize. Coming to London, Whiting held the posts of house-physician and medical registrar at Queen Square, and was later appointed physician to the City Dispensary in College Street. He obtained the M.R.C.P. diploma in 1896, and was for many years a member of the medical staff of the Prince of Wales's General Hospital; he was also physician to the Mount Vernon Hospital for Consumption until the building at Hampstead passed into the hands of the Medical Research Council and the hospital entered on a different phase of work at Northwood. For two or three years at the beginning of this century Whiting held the part-time post of subeditor of the *British Medical Journal*, before the reorganization of editorial duties. His name appeared on the title-page of several editions of *Aids to Medical Diagnosis*, the last being published only this year. He had been a member of the British Medical Association since 1893, and by reason of his experience as honorary secretary of the Fellowship of Medicine he was asked to serve on the Postgradute Courses Committee of the B.M.A. in 1921.

By the death on February 22 of JAMES BATES WILKINSON, M.D., C.M., medical officer of health for Oldham for thirty-eight years, there passed on one who in his day and generation did probably more for the health of the county borough than any other individual. Dr. Wilkinson was born at Godmanchester, Huntingdon, and studied medicine at Edinburgh, graduating in medicine and surgery in 1883, and proceeding M.D. two years later. After holding a post as demonstrator of pathology in the University, he obtained experience of general practice in London, Peterborough, and Manchester, and started practice for himself in Oldham in 1887, during which time he qualified for the D.P.H. of Manchester University. He was appointed M.O.H. for Oldham in 1898, and held this post until his retirement in 1936. He was also superintendent school medical officer from 1906 to 1936, and consulting county medical officer for Huntingdonshire from 1898 to 1911. He lectured in public health subjects for many years at the College of Technology, Manchester. Dr. Wilkinson always took a keen interest in the work of the professional societies associated with his branch of the profession. He had been a member of the British Medical Association since 1886, and acted as representative in the Representative Body when the Association met in Liverpool in 1912. He was a past president of the Institute of Sanitary Engineers. In his early days as M.O.H. Dr. Wilkinson was much attracted to the scientific side of sewage disposal, and gave evidence before the Royal Commission on this subject. He always took an active part in charitable matters, and was a founder-member of the Oldham Rotary Club. Perhaps his greatest interest outside his work was, however, the Order of St. John of Jerusalem and its associated body the St. John Ambulance Association. He was awarded several medals and decorations for his services in connexion with the Order of St. John, being finally awarded the high order of Knight of Grace. Dr. Wilkinson was proud of the fact that he, his son, and his daughter, Dr. Gladys Wilkinson, all received the medal commemorating the Jubilee of King George V.

The following well-known foreign medical men have died: Dr. ANTON SCHNÖLLER of Davos, a tuberculosis specialist, said to have been one of the first physicians to practise artificial pneumothorax, died at Zurich, aged 75; Dr. ADOLPHE LUTZ, for many years chief of the department of medical zoology at the Instituto Oswaldo Cruz, Rio de Janeiro, aged 84; and Dr. DÉSIRÉ GLIBERT, a Belgian physician and one of the leading men in industrial hygiene in Europe.

G. L. Hallez (*Nourrisson*, 1940, **28**, 22) records a case of paratyphoid A in a male infant aged 1 year which is remarkable owing to the rarity of the disease at that age. The fever continued until the ninth day, when some rose spots appeared. There were no other signs of the disease and the spleen remained normal. Recovery took place. The father, who was a nurse in a fever ward, may have acted as a carrier.

The Services

MEDICAL DIRECTOR-GENERAL OF THE NAVY

Surgeon Rear-Admiral Sheldon F. Dudley, C.B., O.B.E., F.R.C.P., K.H.P., has been appointed Medical Director-General of the Navy in succession to Surgeon Vice-Admiral Sir Percival T. Nicholls, K.C.B., F.R.C.S., K.H.P., from July 2, 1941.

DIRECTOR-GENERAL OF MEDICAL SERVICES, AIR MINISTRY

Air Vice-Marshal H. E. Whittingham, C.B.E., F.R.C.P., K.H.P., has been appointed Director-General of Medical Services, Air Ministry, in succession to Air Marshal Sir Victor Richardson, K.B.E., C.B., M.B., D.P.H., K.H.S., from March 1, 1941.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Missing, Presumed Killed

In an Admiralty casualty list, published on March 3, the names of Surgeon Lieut. W. Boyd, R.N., Surgeon Lieut. F. H. Williams, R.N., and Probationary Temporary Surgeon Lieut. H. F. Sloan, R.N.V.R., are included as "Missing, Presumed Killed."

Surgeon Lieut. WILLIAM BOYD was educated at Glasgow University and graduated M.B., Ch.B. in 1932. In the same year he joined the British Medical Association.

Surgeon Lieut. FRANK HANSON WILLIAMS took the L.M.S.S.A. and the L.A.H. in 1933, and had been a member of the British Medical Association since 1934.

Probationary Temporary Surgeon Lieut. HAROLD FITZGERALD SLOAN was educated at Dublin University, where he graduated M.B., B.Ch., B.A.O. in 1937. His home was at Kilmainham, Dublin.

Injured and Wounded

Temporary Surgeon Lieut. Maximillian Raphael Julius Behrendt, R.N.V.R.

Probationary Temporary Surgeon Lieut. Richard George Sarel Whitfield, R.N.V.R.

ROYAL ARMY MEDICAL CORPS

Major JOHN FRANCIS BOURKE, M.C., lost his life at sea by enemy action in January. He took the Scottish triple qualification in 1913 and served during the war of 1914–18, being mentioned in dispatches in 1916 and receiving the Military Cross. He attained the rank of major in 1927 and was invalided out towards the end of 1940. He had just served a term of duty in India and was recently stationed at Quetta, and was on his way home when he met his death. He had been a member of the British Medical Association since 1928.

DEATHS IN THE SERVICES

Surgeon Captain CHARLES JAMES EDWARD COCK, R.N. (ret.), died at Exmouth on February 22, aged 68. He received his medical education at Charing Cross Hospital and qualified M.R.C.S., L.R.C.P. in 1894. Entering the Royal Navy soon afterwards, he became surgeon commander in 1909 and retired with an honorary step in rank as surgeon captain in 1923. He served during the war of 1914–18, receiving the medals, and the President of the Czecho-Slovak Republic conferred upon him the Croix de Guerre in recognition of services rendered during the war.

Colonel EUSTACE AUGUSTUS BURNSIDE, late R.A.M.C., died at Paisley on February 17, aged 80. He was born at Nassau, in the Bahamas, on September 24, 1860, the eldest son of the late Sir Bruce Burnside, was educated at King's College, London, and took the M.R.C.S. and L.S.A. in 1886. Entering the Army as surgeon in 1887, he became lieutenant-colonel in 1911, colonel in 1915, and retired in 1917. He served in the South African War of 1899–1902, when he took part in the actions at Elandslaagte, Rietfontein, and Lombards Kop, and in the defence of Ladysmith, also in the subsequent operations in Natal, the Orange River Colony, and the Transvaal, and received the Queen's medal with four clasps and the King's medal with two clasps. He also served in the war of 1914–18. In 1917 he was appointed a Knight of Grace of the Order of St. John of Jerusalem. He had been a member of the British Medical Association for thirty-two years.

Colonel EDWARD MORESBY HASSARD, late R.A.M.C., died at Hindhead on February 20, aged 78. He was born at Hilsea on November 10, 1862, the youngest son of the late Major-General F. Hassard, C.B., R.E., and received his medical education at St. Bartholomew's Hospital, taking the M.R.C.S., L.R.C.P. in 1886. Entering the Army as surgeon in 1887, he became lieutenant-colonel in 1911, colonel in 1915, and retired in 1919. He served on the North-West Frontier of India in the Isazai campaign of 1892; in West Africa in the Lagos campaign of 1897–8, when he was mentioned in dispatches and received the African medal with a clasp; in operations in Sierra Leone in 1898–9 (clasp); in the South African War of 1899–1902, in operations in the Transvaal, in the Orange River Colony, and in Cape Colony (Queen's medal with three clasps and King's medal with two clasps); and in the war of 1914–18, when he received the Portuguese Order of Avis as commander. He had been a member of the British Medical Association for thirty-four years.

Lieut.-Colonel REGINALD JOHNSON, M.B.E., R.A.M.C., died on February 4, aged 52. He was born on September 12, 1888, and was educated at Trinity College, Dublin, where he graduated M.B., B.Ch., B.A.O. in 1912, proceeding M.D. in 1914. He entered the R.A.M.C. as a temporary lieutenant in 1916, became temporary captain a year later, and took a permanent commission in 1920. He became major in 1928 and had recently been promoted to lieutenant-colonel. He had lately been stationed at Quetta.

Universities and Colleges

UNIVERSITY OF OXFORD

The following medical degrees were conferred on March 1:

D.M.—R. N. B. Cridland, N. L. Rusby.

B.M.—J. C. Pease, J. B. Wilkinson, R. B. Buzzard, J. J. Pritchard.

UNIVERSITY OF CAMBRIDGE

The Rockefeller Foundation has agreed to continue until the end of 1941 its grant of £1,200 a year for research in cellular physiology at the Molteno Institute under the direction of Prof. Keilin.

In Congregation on March 1 the Senate resolved to confer the degree of Master of Arts upon Leicester Hammond Aitken, M.B., B.Ch.N.Z., F.R.C.S.Ed., university demonstrator in anatomy.

The following medical degrees were conferred on March 1:

M.B., B.CHIR.—(By proxy). W. W. Brigden, C. E. Watson, S. C. Gold, F. A. Whitlock.

UNIVERSITY OF LONDON

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

Entrance Scholarships and Exhibitions

Two Goldsmid Entrance Scholarships, entitling the holder to the final course of medical study, are offered for competition in July and are open to students who are preparing for the degrees of the universities of London, Oxford, Cambridge, Durham, or other British universities, or for the diplomas of the Royal Colleges of Physicians and Surgeons; also one Goldsmid Entrance Exhibition, entitling the holder to a reduction by £80 of the fees due for the full course of final medical study; and the Filliter Entrance Scholarship in Pathology, entitling the holder to a reduction by £52 10s. of the fees due for the full course of final medical study. Entries must reach the Secretary, University College Hospital Medical School, University Street, W.C.1, by July 5, and applications for further particulars should be made to the same address.

UNIVERSITY OF ABERDEEN

On February 26 the Senatus agreed to confer the honorary degree of LL.D. on Prof. Arthur Wellesley Falconer, C.B.E., D.S.O., M.D., F.R.C.P., Principal and Vice-Chancellor of the University of Capetown.

UNIVERSITY OF EDINBURGH

At a meeting of the University Court on February 24 Prof. A. Patrick and Prof. J. Hendry were appointed external examiners in systematic medicine and systematic midwifery and gynaecology respectively.

Prof. J. R. Learmonth was appointed a member of the Lister Memorial Committee of the Royal College of Surgeons of England for the award of the Lister Memorial Prize and Medal for 1942.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

The following have been elected to the Fellowship of the College:

William Cunningham Armstrong (Glasgow), Norman Llewellyn Edwards (Derby), Alistair Livingston Gunn (London), Joan Kennedy Rose (Edinburgh), Wentworth Alexander Taylor (Birmingham), Robert Watson (Northampton).

Medical Notes in Parliament

Increase in Road Accidents

The BISHOP OF WINCHESTER, in the House of Lords on February 25, said that since the war started road casualties had exceeded the worst previous figures. In the last four months of 1940 persons killed numbered 4,380, of whom 496 were children. In January the number killed dropped to 741, of whom sixty-three were children. In parts of the country during January the roads could not be used for motor traffic. Totals of non-fatal accidents on the roads were not now published; judging by the proportion between deaths and injuries before the war, the 8,600 killed on the roads in 1940 were accompanied by 250,000 injured, including 70,000 seriously injured. Over half the accidents occurred during the black-out, but in the last months casualties during the black-out had diminished while those in daylight had steadily increased. Comparing the last three months of 1940 with the last three months of 1939, the increase in casualties in daylight had been 63%. Casualties at night had been considerably but not correspondingly reduced. No legal claim could be made by hospitals for persons injured by military vehicles; the hospitals were anxious to know whether they would get compensation from the War Office. The police and the Post Office had agreed that they would not claim exemption, and would pay compensation if accidents occurred through the driving of vehicles by their employees. The hospitals hoped the War Office would take the same line.

LORD SNELL said that in the Metropolitan Police District there was an increase of 100% in the number of pedestrians killed in the winter months of war compared with the corresponding winter months of 1938–9. For motor cyclists the increase was 77%. Motor drivers caused fewer casualties, and those of pedal cyclists had decreased until this winter. Casualties had increased on roads not subject to speed limits, and daylight casualties had increased on all roads. With regard to military accidents, no Crown vehicles were insured, and there was no proposal at present to alter that. Taking November and December, 1940, as a period of observation, the Secretary for War had acknowledged that 300 accidents a day due to military vehicles was unsatisfactory. Special instructions had been issued to Commands about care on the roads. There for the moment they must leave that matter. Better street lighting was practicable, consistently with air-raid precautions, and would be considered before the next winter period. Safety instruction among children was being resumed.

Fracture Treatment and Rehabilitation

Dr. MORGAN asked Mr. Ernest Brown on February 20 what steps were being taken to secure modern and adequate fracture treatment of industrial injured workers, and whether the organization of such treatment would be on the lines recommended by the British Medical Association Committee and by the Delevingne Interdepartmental Committee in approved fracture clinics in hospitals or other centres. Mr. BROWN announced that in conjunction with the Minister of Labour and the Secretary of State for Scotland he was considering the better organization of facilities for the treatment of fractures, the rehabilitation and, where necessary, the re-training of injured industrial workers. He would make a further statement as soon as possible.

Voluntary Hospitals and the War Damage Bill

Moving the third reading of the War Damage Bill in the House of Commons on February 26, Sir KINGSLEY WOOD said with regard to voluntary hospitals that it would be the duty of the War Damage Commission to consult with the Minister of Health. That Minister assured him that if he was consulted on questions affecting voluntary hospitals he, for his part, would consult the organizations representing the voluntary hospitals movement, such as King Edward's Hospital Fund, the British Hospitals Association, and particular hospitals concerned. The base of the scheme would be full, cordial, and close co-operation. The Government would decentralize the administration of the scheme and would open offices in the towns in which were situated Civil Defence Regional Commissioners. Four regional offices would be set up in the London area.

Shelter Conditions

Replying to Captain Cunningham Reid on February 27, Miss WILKINSON said local authorities had used their powers to close shelters which were damp and trenches which had fallen in. In London a number of trenches had been closed. Where official shelters under local authorities had been closed the police had power to deal with persons who visited them. The Ministry of Home Security recognized that large shelters invited tragedy, and encouraged people to stay in their homes or to use small surface shelters. On February 5 the Horder Committee submitted recommendations on the matter, which were being considered. The Ministry might ask the House for a new Defence Regulation, giving power to turn people out of places where they ought not to go. Mr. EVELYN WILKES hoped Miss Wilkinson would persuade local authorities to improve the sanitation and lighting of surface shelters. Miss WILKINSON said everything should be done to persuade the people that the surface brick shelters were useful.

Estimated Expenditure on Health Services

Estimates are issued for the financial year which will end on March 31, 1942. These include provision of £24,646,200 for the Ministry of Health, against £23,891,724 in 1940–1; £208,962 for the Board of Control, against £184,216; £4,384,544 for the Department of Health for Scotland, against £4,295,319; £20,300 for the Board of Control, Scotland, against £17,827; £106,900 for Broadmoor Criminal Lunatic Asylum, against £93,664. Token votes of £100 each are asked for the war services of the Ministry of Health and the Department of Health (Scotland).

Compulsory Evacuation of London Children.—The Minister of Health told Miss Cazalet on February 27 that the number of children who, after medical examination under the new Order, had been compulsorily evacuated was six. It was expected that where the evacuation of a child was shown to be desirable on medical grounds the parents would normally agree and recourse to a compulsory Order would be unnecessary. The total number of children evacuated in this way was unlikely to be large, since the health of children in London remained good. Out of 395 children inspected in shelters in Kensington, the examining doctor was prepared to certify fourteen for compulsory evacuation; all fourteen were being sent away voluntarily

Notes in Brief

Up to February 26, 28 civilians—19 men and 9 women—had been reported in hospitals in the United Kingdom with injuries from enemy action which resulted or were likely to result in blindness.

On February 18 Miss HORSBRUGH informed Sir Thomas Moore that there was no general shortage of blood donors, but in certain areas more were needed. Local campaigns were being organized in those areas.

Between July 1, 1940, and January 31, 1941, the total number of amputations in civilians due to injury by enemy action was 776. The number of recorded cases of eye injury of a kind necessitating removal since the outbreak of war was 191.

The twenty-first annual report of the James Mackenzie Institute for Clinical Research at St. Andrews is a brief document of twelve pages, and half of those are given up to the financial position, which is very serious. In order to meet ordinary expenditure investments have had to be realized, with consequent loss of income. On an income of less than £1,000 the Institute has made every effort to carry on the work as in pre-war days, and this has been possible in the children's department, where forty-six clinics were held during the year, and 674 children attended; in the laboratories, and in the x-ray department. Under the blood transfusion service, 154 volunteer donors have had their blood typed during the year. The clinical research fund makes grants for research out of the income from a trust provided by an anonymous donor. An appeal is made by Prof. David Waterston, the chairman of the council, for financial help for the work founded by the late Sir James Mackenzie.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

Pneumonia (primary and influenzal), dysentery, and cerebrospinal fever have increased in incidence during the week. Whooping-cough, diphtheria, and scarlet fever declined slightly and measles considerably.

Cerebrospinal Fever

Compared with the beginning of last year cerebrospinal fever has been unusually prevalent, as is shown by the figures for the first eight weeks for both years (figures for 1940 in parentheses): 229 (52); 266 (107); 293 (142); 303 (190); 331 (295); 345 (402); 378 (560); 434 (586). More important than total numbers over a given period is the rate of increase, which was very steep last year, reaching its peak at the end of March, when weekly notifications reached the high level of 623. The more gradual development of the present epidemic is in itself a favourable sign, but the notifications are high in certain areas. Present conditions favour the spread of the disease. During the week more than five cases were recorded in: Lancaster 63; London 32; West Riding of Yorkshire 23; Chester 18; Southampton 17; Glamorgan and Warwick 16 each; Middlesex 13; Essex 12; Flint 10; Gloucester and Surrey 9 each; Kent 8; and 6 each in Berkshire, in both East and North Riding of Yorkshire, in Monmouth, and in Stafford.

In Scotland, so far, notifications have remained below those of the previous year; the rate of increase for both years is approximately equal.

Diphtheria Immunization in Scotland

The experience of the diphtheria immunization campaign conducted in Edinburgh in the last three months presents certain features of interest. Of the total of 26,131 children immunized to date, 12,153 were inoculated in first-aid posts, 3,737 in schools, 2,842 at child welfare centres, and 7,399 in private practice. Although the number dealt with so far (close on 30,000 if 3,000 treated during an experimental period before the campaign are included) is only one-half that originally aimed at, and the use of first-aid posts has been discontinued, the campaign is being pressed home, for half-measures exert but little effect on the prevalence of the disease and may, under certain conditions, actually constitute a threat to the unimmunized; attempts should be made to protect at least 75% of the child population.

Influenza for Week Ending February 22

In the week ending February 22 314 deaths were ascribed to influenza in the great towns, 10 fewer than in the previous week. The age distribution of the deaths continues to be normal—54.1% of the deaths are at ages over 65 and 6.4% at ages under 25. In the County of London the deaths have decreased from 50 to 26 and hospital admissions from 526 to 379 (influenza, bronchitis, pneumonia). The proportion of total deaths coming from the South-Eastern Area (including Greater London) has decreased to 35.2%.

Total of Influenza Deaths and Deaths in Age Groups in 126 Great Towns for Week Ending February 22

All Ages	A Under 1 year	B 1-5	C 5-15	D 15-25	E 25-35	F 35-45	G 45-55	H 55-65	I 65-75	J 75 and over
314	9	9	2	7	6	19	33	59	89	81

Regional Totals of Influenza Deaths for Week Ending February 22

South-Eastern Area:		Midland Area	81
Greater London	95	Eastern Area	5
Rest of S.E.	27 = 122	South-Western Area	4
Northern Area	106	Wales and Monmouthshire	29

Total for 126 Great Towns, including the Outer Ring 347

We are not entitled to assume that a further increase in the great towns will not occur—namely, that the epidemic has spent itself. But it is now improbable that this winter's mortality will be as great as that of last year and very improbable that a major recrudescence will occur.

No. 6

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended February 8, 1941.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales, (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	(b)	(c)	(d)	(e)	1940 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	345	32	88	3	11	402	20	96	5	5
Deaths		6	8				6	6		
Diphtheria	1,103	60	385	25	25	612	25	171	43	26
Deaths	35	2	4	—	—	18	—	8	3	2
Dysentery	168	3	31		—	31	—	30		—
Deaths		—	—	—				—	—	—
Encephalitis lethargica, acute	7	1	1		—	6	—	—		—
Deaths							—	1		
Enteric (typhoid and paratyphoid) fever	7	—	4	2	1	11	2	4	5	1
Deaths	1	—	—	—	—	—	—	—	—	—
Erysipelas			53	12	5			52	7	5
Deaths			—				1	1		
Infective enteritis or diarrhoea under 2 years	39	4	11	7	1	38	3	8	4	3
Deaths										
Measles*	15,486	408	171		16	4,737	45	53		480
Deaths	32	2	1	2	—	7	—	—	2	10
Ophthalmia neonatorum	82	6	20		1	68	4	32		2
Deaths										
Pneumonia, influenzal†	1,741	171	66	13	8	2,210	130	159	14	22
Deaths (from influenza)	261	56	30	8	4	514	53	123	6	24
Pneumonia, primary			430	14				706	20	
Deaths		56		22	23		134		26	32
Polio-encephalitis, acute	1	—				4	—			
Deaths		—					—			
Poliomyelitis, acute	10	—	3	1	—	5	—	1		—
Deaths		—	—		—		—	—		
Puerperal fever	9	9	13	1	1	1	1	7	—	—
Deaths		—								
Puerperal pyrexia	129	9	24		2	153	7	22		4
Deaths		1								
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,217	65	188	37	38	1,076	48	137	44	74
Deaths	3	—	—	—	—	3	—	—	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths	—	—	—	—		—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—		—	—	—	—
Whooping-cough	3,023	53	458		25	539	24	10		12
Deaths	38	—	19	1	—	10	—	5	1	—
Deaths (0-1 year)	513	35	98	42	17	539	49	114	35	30
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	7,420	1327	996	284	184	9,212	1,455	1,429	294	279
Annual death rate (per 1,000 persons living)			21.7	0.7	16.1			27.4	19.6	24.5
Live births	5,428	402	892	340	225	6,536	967	926	341	229
Annual rate per 1,000 persons living			18.0	22.6	19.7			18.7	22.8	20.1
Stillbirths	198	5	51			295	35	51		
Rate per 1,000 total births (including stillborn)			54					22		

* Notification in certain administrative areas only.

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Medical News

Sir Arthur Keith has been elected an honorary member of the New York Academy of Sciences.

Prof. Geoffrey Jefferson, F.R.C.S., and Mr. A. Tudor Edwards, F.R.C.S., have accepted appointments as honorary consultants to the Ministry of Pensions at the invitation of the Minister.

The name of Dr. Ernest Berry Garrett, medical officer, A.R.P. Casualty Service, Leicester, has been brought to notice for brave conduct in civil defence.

The next meeting of the Shaftesbury Military Hospital Medical Society will be held at the hospital on Tuesday, March 11, when Major W. C. Somerville-Large, R.A.M.C., will speak on "The Army's Feet."

At a meeting of the Pharmaceutical Society of Great Britain, to be held on Thursday, March 13, at 2.30 p.m., at 17, Bloomsbury Square, W.C., an address entitled "Recent Developments in Pharmaceutical Practice" will be given by Mr. H. Berry, B.Sc., dean of the Society's college. It will include a discussion on present knowledge of the problems concerned with the preparation of solutions for parenteral injection, their sterility and stability; and the need for further investigations of the stability of pharmaceutical preparations will be stressed.

A general meeting of the Tuberculosis Association will be held at 26, Portland Place, W., on Saturday, March 15, at 10.30 a.m., when Dr. W. E. Snell will read a paper on "Senile Tuberculosis," and a discussion on "Current Topics" will be opened by Dr. F. T. Clive, followed by Dr. J. Glyn Jones.

The home of Lord and Lady Melchett, Colworth House, Sharnbrook, near Bedford, was opened on March 1 by Mrs. Rex Benson, representing the British War Relief Society of New York, as a rest home for London's voluntary hospital nurses. The hon. secretary of the home is Mr. Charles M. Power, and inquiries in regard to it may be addressed to him at Westminster Hospital, St. John's Gardens, London, S.W.1.

The issue of the *South African Medical Journal* for December, 1940, is devoted to syphilis. In this C. K. O'Malley records that there are five times more cases of early syphilis among Europeans in Capetown than in Stockholm (Capetown 0.9, Stockholm 0.18, per 1,000 of population), and there are twenty times more cases of congenital syphilis among the European population in Capetown than in Stockholm (Capetown 0.19 and Stockholm 0.01 per 1,000 of population).

The current issue (September, 1940) of the *Chinese Medical Journal* is devoted to the history of Chinese medicine.

The recently published August–September issue of *Tubercle* contains a supplement on tuberculosis in wartime.

Messrs. Oliver and Boyd, Ltd., Tweeddale Court, Edinburgh, and 98, Great Russell Street, London, W.C., have been appointed publishers to the Royal Society of Edinburgh. Copies of previous issues of the *Transactions* and *Proceedings* and of all future publications of the Society will now be supplied by this firm, to whom all inquiries should be sent.

Full details of the arrangements that have been made for the provision of spectacles as part of the treatment of patients under the Emergency Hospital Scheme are contained in a circular (No. 2240) from the Ministry of Health to all local and hospital authorities concerned in the Scheme and to medical officers of health. The arrangements apply to members of the Services and those civilians (*a*) who have suffered injury through enemy action or in carrying out civil defence duties, and for whom spectacles are required to correct defective vision or changes in vision caused by the injury, and (*b*) who are receiving in-patient treatment under the Emergency Hospital Scheme and for whom spectacles are necessary for the efficient treatment of the condition for which they were admitted.

Owing to the war the annual report of the Family Planning Association for 1939–40 gives only a brief statement of the past year's work and present plans, and appears as a four-page leaflet. The association, of which Lord Horder is president, has been able to keep its headquarters in being and to carry on from this at least part of its usual work. The wartime office is at 190, Old Christchurch Road, Bournemouth, and part of the usefulness of the organization is maintained through the kindness of the Eugenics Society at the London offices, 69, Eccleston Square. The Medical Subcommittee continues to examine the value of present contraceptive methods and to report on the results to members of the medical profession and other inquirers. It also endeavours to overcome difficulties in the supply of contraceptives which are due to war conditions.

Ripley Court, an early eighteenth-century country house in Surrey, has been taken over by Westminster Hospital as a maternity home and teaching centre, in conjunction with the Surrey County Council, which has reconditioned the house, and the Westminster City Council ante-natal clinics. Westminster Hospital is providing complete equipment for a unit of 25 beds, with medical and nursing staff. The home was opened on January 8.

The Ministry of Labour and National Service has made regulations prescribing standards of lighting in certain classes of factories. These are substantially similar to those issued in draft last autumn, the main difference being that the list of classes of works of a special character in the schedule to which the Regulations apply only in a somewhat modified way has been extended. The Regulations came into force on February 1.

Dr. Arnulfo Arias, a distinguished physician of Panama who had previously held the posts of Director of the Department of Hygiene and Minister of his country in Italy, France, and England, has recently been appointed president of the Republic of Panama.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be addressed to the Secretary.

TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology, Westcent, London*; SECRETARY, *Medisecra Westcent, London*.

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Treatment of Night Sweats

"J. N. T." would be grateful for any suggestion about the treatment of heavy night sweats in an obscure case. There is no evidence of heart disease. The patient has a slight cough but no sputum. There is no evidence of lung disease. There is a nocturnal rise of temperature to 99° or 100° F., which is followed by a drenching perspiration lasting for two or three hours. On two or three occasions there had been symptoms and signs resembling mild Addison's disease—feelings of exhaustion, low blood pressure, and patches of pigmentation in the skin. The urine is normal. The patient has not had malaria. There is undoubtedly a psychological element in the case. So far the injection of atropine has helped to control the perspiration, but the condition still persists.

Local Treatment of Herpes Zoster

DR. PATRICK DUFF (Ballyshannon) writes: I was interested in reading a letter by Dr. A. H. Bartley on treatment of herpes zoster (January 4, p. 38). For some time I have received very excellent and immediate results by local treatment of the erup-

tions by tannic acid jelly (amertan, Lilly) and radiant heat in the same manner as in the treatment of burns. I have also found similar treatment valuable in a case of pemphigus. A male patient aged 76 years was admitted to hospital with widespread pemphigus vulgaris, and although various remedies were tried his condition was becoming worse. He was put on local applications of tannic acid jelly as described above, and this produced a marked improvement in the eruptions and gave the patient great relief. He was later put on calciferol as recommended by H. King and C. M. Hamilton, New York. After six weeks on the above treatment the skin lesions have cleared up with no recurrence of bullae.

Income Tax

Retirement

"J. C." retired on September 30, 1940. How should he calculate his liability? (It is understood that his previous assessments have been on the "cash basis.")

*** His liability for 1940–1 is in respect of the profits for the period from April 5, 1940, to September 30, 1940, only; he should prepare a statement on the usual lines (cash receipts and payments apparently) for that period. If this produces a balance of profit that is clearly insufficient for a six-months account—for example, by bringing in as an expense two half-years' rents instead of one—the inspector of taxes may require an account on the "earnings" basis.

Partnership—Acquisition of Partner's Share

"GAMMA" has taken over his late partner's three-fifths share as from October, 1940, and is employing an assistant. It may be assumed that the profits of the practice will be less than in the past. The assessments have been on the basis of cash receipts; cash for the old firm's debts is not coming into the "new practice" accounts.

*** The simplest method is for "Gamma" and his late partner to elect to have the practice regarded as having ceased and recommenced as a "new" one. As regards the old firm the effect will be that the assessment for 1940–1 will be reduced to the amount of the profit for the period from April 5, 1940, to the date of dissolution; also, if the assessment for the year to April 5, 1940, was less than the amount of the profits for *that* year, then the assessment can be increased to bring it up to the actual profit amount. As regards the "new" firm, "Gamma" will be assessable for the period from the date of dissolution to April 5, 1941, on the amount of his earnings for that period, and for the year to April 5, 1942, on the amount of his first twelve months' earnings. In either case the result should be equitable.

Expenses of Removal, Renewals, and Insurance

"J. M." inquires whether the following are allowable expenses: (*a*) cost of removal to present location, and (*b*) renewals of waiting-room carpets and linoleum. He also asks for advice as to a "cost of replacement" insurance policy for the house and contents.

*** (*a*) Not allowable; (*b*) allowable. As to the question of insurance we cannot recommend a particular company, but suggest that "J. M." might communicate with the Medical Insurance Agency.

Half Pay during Instruction Course

"G. H" has been appointed to the Colonial Service, but is required to take a full-time course in tropical medicine, during which he receives half pay. Is this liable?

*** Cases of this type depend on the wording of the Service agreement; prima facie we should regard the half pay as liable. The similarity with non-taxable subsistence allowance is not very close as such an allowance is given for additional expenses while in receipt of taxable pay. The point may be worth taking up with the taxing authority, but we should not advise an appeal.

Purchase of Practice

"D. C." was working as a locumtenent from April 6, 1939, to October 15, 1939, from which date he acquired the practice. What should be the basis of his liability for 1939–40 and 1940–1?

*** It has to be borne in mind that the previous year's basis does not apply where an employment ceases or to the first year or two years of a new practice. As a result the basis for the years in question in this case becomes:

1939–40—The earnings of the actual year—i.e., £730.
1940–1—The amount of the profits of the first year of the practice after "D. C." took it over—i.e., £1,107.

If, however, "D. C." wishes the assessment for 1940–1 and each of the two following years can be based on the earnings of the actual year; but he cannot choose between those years, the "actual-year" basis if applied must be applied to all three years.

LETTERS, NOTES, ETC.

Bell's Palsy and Herpes Zoster

Dr. G. LLEWELLYN DAVIES adds the following note to his letter published last week under the title "Bell's Palsy and Herpes Zoster": My patient with the herpes and the Bell's palsy did complain of an intense pain in the ear on the same side as his other symptoms. He reminded me of this yesterday, but the rush of work prevailing at the time did not enable me to assess the true value of this symptom, and my rather cursory examination of the ear evidently did not reveal any vesicles. Had I tumbled to the true pathology of the condition I should probably have used an aural speculum.

Bran in the Prevention of Constipation

Dr. M. E. LAMPARD (Colchester) writes: Apropos the letter from Dr. F. Parkes Weber (February 15, p. 252) about all-bran, many of my patients have been using ordinary bran for the last few years, with excellent results. We have also consumed it in our own household. It is advisable to buy it from a miller, as when it is stored in corn merchants' shops it is apt to contain weevil. It can be taken well wetted with cold milk and with porridge added.

Naming of New Drugs

Mr. CHARLES ALEX. HILL (Managing Director of the British Drug Houses Ltd.) writes: In the note appearing in the *Journal* of February 22 (p. 280) the writer is undoubtedly correct in stating that "great difficulties attend alterations in nomenclature of drugs"; but I think that he has slipped slightly in suggesting, as I think he does, that we have shown inconsistency by coining the names "anacardone" and "iodatol." The B.D.H. set up the manufacture of pyridine-β-carboxylic acid diethylamide so soon as the patent expired, and made it available to the medical profession in January, 1939. We could hardly market it under its chemical name, for this contains thirty-five letters, and the only existing short name then was a registered trade mark, the property of the patentee firm. We were obliged, therefore, to coin a new name, and "anacardone" was chosen as being both "appropriate" and "easily memorized." It was not until two years later that the substance was made official as "nikethamide" in the Third Addendum to the *B.P.* (January 1, 1941). To change over abruptly from the name "anacardone" to the name "nikethamide" would seriously inconvenience practitioners who have known and have been prescribing the drug as "anacardone" for the past two years. Similarly, the name "iodatol" for iodized oil was coined by us in 1914. Iodized oil was made official in the Addendum, 1936, to the *B.P.* (December 29, 1936)—twenty-two years later.

Friedländer's Pneumobacillus and Sulphapyridine

Dr. MORRIS CUTNER (Chelsea, S.W.) writes with reference to Surgeon Lieutenant Fraser Sinclair's clinical memorandum on the above subject (February 8, p. 196): Early in 1939, during the routine investigation of a chronic cough, a predominating culture of the pneumobacillus was obtained from the muco-purulent sputum. An attempt to treat this by sulphanilamide with the patient ambulant proving unsuccessful, the use of sulphapyridine was considered. An opportunity occurred when the patient was in bed with influenza. He was submitted to a full oral course of the drug. The influenzal condition improved within a few days, but the degree of cough and amount of sputum remained unaltered. Later a further examination confirmed the presence in the sputum of the pneumobacillus in undiminished amount.

Spasm of Sphincter of *Oddi*

"A.B.C." writes: My experience conflicts with that of your contributors who state that morphine in any form causes spasm of the sphincter of Oddi. For many years I have suffered from periodical attacks of spasm of this sphincter, resulting in an acute and very painful distension of the gall-bladder. This can be felt as a rounded tender prominence in the hypochondrium. Naturally, the pain—which is continuous and which simulates a painful indigestion—is insidious in its onset, but as soon as I am sure what is happening I give myself an injection of morphine grain 1/4 with atropine grain 1/100. This invariably has given complete relaxation and relief within fifteen to twenty minutes, the bile escaping with an audible gurgle; and as the attacks always come on in the late afternoon or evening and send me to bed, I am soon asleep. A sufficiently large dose of acetylsalicylic acid (gr. xv) will often relieve the condition if taken early in the attack. Fortunately there has been no recurrence for some months, and now I have nitroglycerin at hand if and when it does come.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
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OLD AGE WELFARE

BY

J. C. C. LANGFORD, M.R.C.S., L.R.C.P.

It is very natural that infant welfare has inspired much more interest than old age welfare, which may, by comparison, appear even depressing. But the latter subject is important. Moreover, the aged invalid has greater capacity for mental suffering than has the infant, and this fact should spur reformers to spend more time in consideration of the welfare of old people, and especially of *poor old people.*

The Poor Old Person

The lot of the average poor, or even moderately impecunious, old man or woman is not as happy as it ought to be. All too often the old person, suffering from chronic illness, is living a lonely life in one of those wretched semi-slums which are still such prevalent reminders in our suburbs of past gentility now gone to seed. Such places are so depressing as to have a deleterious effect on their unfortunate inmates.

Often the poor old person has been "parked" *on relatives.* Often the relatives are surprisingly unselfish and kind in their attentions, but it is very hard on a young and struggling married couple with several children to be burdened with, say, an elderly invalid aunt or uncle whom nobody else will have. Very often, too, the elderly, by reason of their infirmities, are awkward, stubborn, and testy. Capacity for self-sacrifice is a virtue to be extolled, but the demand for its employment may sometimes be unjust, unnecessary, and inadvisable; also there is a point beyond which youth should surely not be sacrificed to age. It follows that old age welfare is important not only to the aged but also to younger people indirectly.

Serious Illness in the Aged

One of the major problems in dealing with the aged poor arises when serious illness supervenes. Sometimes the patient may be treated fairly satisfactorily at his home with the aid of local district nurses. Not infrequently admission to a hospital may be advisable, if only for the reason that a visiting district nurse, however competent she may be, cannot always give sufficient time for some cases when much skilled nursing is required. It may happen, and especially in wartime, that it is not easy to obtain hospital accommodation for such cases, or elderly patients may be stubborn in their refusal to go into an institution of any kind, partly from a not unnatural horror of "institutionalism" and partly because they cling pathetically to the remnants of home—as if, by loss of contact with their belongings, however poor, they would lose touch with life itself. I think it right to stress the point that such difficulties are by no means confined to the *very* poor.

A Communal Plan

These problems of old age welfare could best be solved, in my opinion, by a system of blocks of "flatlets" arranged somewhat as follows:

The buildings should be pleasant, well built, and as *un*-institutional as the architects could make them. They should be situated in healthy localities, and surrounded by lawns and gardens. Lifts should be installed. Each old person or old couple should have at least two private rooms—one for sleeping and one for "sitting." These rooms, whenever possible, should be furnished by the tenants with their own possessions. There should be a resident trained nurse or nurses in every block. Remotely situated almshouses *without* such skilled resident nurses are of doubtful value in my experience. This point about resident nurses is most important, for it should thus be possible in many cases to avoid the necessity for removal to hospital, and the resident nurses would be able to give more time than the most conscientious of visiting district nurses.

Such blocks of flatlets, I suggest, should be supplied with communal kitchens, laundry rooms, a few isolation rooms, and a *common hall for entertainments. It would be most important* (1) to try to give all the advantages *of a well-run institution,* with (2) as little of the *institutional atmosphere* as possible. This may sound contradictory, but the meaning is *obvious.*

There are other points, of course, such as arrangements for medical attendance when required, and it would be an advantage if the visiting M.O. (for private or panel doctor) could have the right to call into consultation experts from the staff of the local county hospital in cases of serious obscure illness, when such consultations might obviate the necessity for removal to hospital for further investigation. Especially during war, but probably at any time, there is much to be said for building these blocks in country places, provided that the sites are not too remote from hospitals, bus services (for visitors), etc.

Perhaps the times may seem inopportune for discussion of this subject, but it is at least interesting to think out in advance *another way in which the lot of our fellow men and women* could be made much happier in the days which will follow war.

MEDICAL CERTIFICATES FOR NAVAL RATINGS

A certain amount of difficulty is being experienced by the Naval authorities in connexion *with medical certificates* granted in respect of Naval ratings by medical practitioners who are called in to attend *Naval men who fall ill when on* leave. It is essential for medical practitioners to certify on these occasions that *the Naval rating is unfit to travel.* This is required, as if the rating is fit to travel then it is necessary for *him* to go back to his ship or to a Naval hospital to receive treatment there. Failure to give the certificate involves a considerable amount of correspondence between the Naval authorities and the medical practitioners concerned, and valuable time would be saved on both sides if certificates were invariably to be made out in accordance with the instructions (which are fully explained on the back of each Naval rating's leave ticket).

The position of radiologists on the staffs of voluntary hospitals at which medical staffs are remunerated for E.M.S. work on the occupied-bed basis has been considered by the Advisory Emergency Medical Service Committee at the request of the Radiologists Group Committee of the B.M.A. On the subject of the special investigation or a second opinion given in the out-patient department in relation to a Service patient, the Advisory Committee has expressed the following opinion:

That, when a Service patient is referred by a Service medical officer to the out-patient department solely for the purpose of radiological examination and report, the whole fee of one guinea should be paid to the radiologist.

MEDICAL WAR RELIEF FUND

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£10 10s.—South-East Essex Division—per Dr. Hiscocks.

£9 9s.—Bath Insurance Practitioners—per Hon. Secretary Bath Panel Committee

£5 5s.—Per Dr. R. A. Lattey, Torquay (amount already sent £172 3s. 6d.): Dr. V. A. P. Costobadie.

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Local Medical Panel Committees

£200. Manchester

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£5. Norfolk

Total—£18,000 16s. 7d. and £100 3½% Conversion Stock

B.M.A.: Branch and Division Meetings to be Held

NORTH OF ENGLAND BRANCH.—At Newcastle-upon-Tyne, Thursday, March 13, 2.30 p.m. Prof. J. A. Nixon, "Chest Wounds from a Physician's Standpoint"; 3.45 p.m. Drs. A. E. W. McLachlan and Sydney Thompson, Clinical demonstration. Members of the Services stationed in the area of the Branch are invited to attend

SUSSEX BRANCH: BRIGHTON DIVISION.—At Hove, Thursday, March 13, 3 p.m. Clinical meeting. (Postponed from March 6.)

FIRE PREVENTION DUTIES

Medical practitioners are asking whether they are liable for fire prevention duties. The Civil Defence Duties (Compulsory Enrolment) Order, 1941, gives local authorities power to enrol local residents for compulsory fire prevention duties in the area. As a result of representations made by the British Medical Association the Ministry of Home Security has promised to take steps to exempt medical practitioners from registration and enrolment under this Order.

The Fire Prevention (Business Premises) Order, 1941, compels occupiers of business premises to make arrangements for fire prevention duties, but it is expressly stated that this Order does not apply "to any premises occupied by any person partly as his dwelling house and partly for the purpose of his business, trade, or profession." This proviso automatically excludes from liability under the Order medical practitioners whose surgeries are at their place of residence. There remains the case of a practitioner who has a lock-up surgery or who lives away from his surgery. He is liable to make arrangements for the protection of the premises, and he will do this in most cases by employing someone to undertake fire prevention duties.

Postgraduate News

The Fellowship of Medicine announces the following postgraduate courses for Final F.R.C.S. candidates: (1) orthopaedics (theoretical), lecture-demonstrations, illustrated by x-rays, on Wednesdays at 2.30 p.m., at Medical Society of London, 11, Chandos Street, W., March 26 to April 30; (2) comprehensive revision course at Royal Cancer Hospital, clinical and theoretical teaching, daily, 10 a.m. to 1 p.m., March 31 to April 25; (3) operative surgery, thrice weekly, 2 p.m., March 31 to April 25.

WEEKLY POSTGRADUATE DIARY

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.—*Daily*, 10 a.m. to 4 p.m., Medical Clinics, Surgical Clinics and Operations, Obstetrical and Gynaecological Clinics and Operations. *Daily*, 1.30 p.m., Post-mortem Demonstration. *Tues.*, 11 a.m., Paediatric Clinic, Dr. R. Lightwood. *Wed.*, 11.30 a.m., Clinico-pathological Conference (Medical); 2 p.m., Historical and General Aspects of Shock, Prof. J. H. Dible; 3 p.m., Clinico-pathological Conference (Surgical). *Thurs.*, 2 p.m., Radiological Demonstration, Dr. Duncan White. *Fri.*, 2 p.m., Clinico-pathological Conference (Gynaecological).

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1 Wimpole Street, W.—*Brompton Hospital*, S.W.—Mon. and Thurs., 4 p.m., M.R.C.P. Course in Chest Diseases. *West End Hospital for Nervous Diseases.*—Tues. and Fri., 3.30 p.m., Clinical Demonstrations in Neurology. *Royal National Orthopaedic Hospital*, Stanmore.—Sat., 2.15 p.m., F.R.C.S. Clinical Orthopaedic Course. *Medical Society of London*, 11, Chandos Street, W.—Mon., 2.30 p.m., F.R.C.S. Course in Neurological Surgery. Lecture-demonstrations: (1) Intracranial Tumours, General; (2) Cerebral Tumours.

DIARY OF SOCIETIES AND LECTURES

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.—Demonstration. *Mon.*, 3 p.m., Surgeon Rear-Admiral Cecil P. G. Wakeley, Tumours of the Alimentary Tract; *Tues.*, 3 p.m., Mr. R. Davies-Colley, Tumours of the Breast; *Fri.*, 3 p.m., Dr. A. J. E. Cave, The Innervation of the Body Wall.

ROYAL SOCIETY OF MEDICINE

Section of Proctology.—Wed., 2.30 p.m. Clinico-pathological meeting at St. Mark's Hospital, City Road, E.C. Demonstration by Dr. Cuthbert Dukes and Mr. H. T. R. Bussey: Venous Spread of Carcinoma of Rectum. Cases and specimens will be shown.

DAVYHULME MILITARY HOSPITAL MEDICAL SOCIETY.—*Thurs.*, 3 p.m. Discussion: "Effort Syndrome." To be opened by Prof. Crighton Bramwell. Medical men and women in any Services (including civilian) will be welcomed.

VACANCIES

EXAMINING FACTORY SURGEONS.—The following vacant appointments are announced: Stoney Stanton (Leicestershire); Loanhead (Midlothian); Leominster (Herefordshire). Applications to the Chief Inspector of Factories, Cleland House, Page Street, S.W.1, by March 11.

APPOINTMENTS

CROWTHER, J. W., M.B., Ch.B., Examining Factory Surgeon for the Stretton District (Cheshire).

METROPOLITAN BOROUGH OF STEPNEY.—*Temporary Assistant Medical Officers of Health*: Caroline Meade, M.B., B.S., D.P.H., and J. P. Crichton, L.R.C.P. & S.Ed., D.P.H.

BIRTHS, MARRIAGES, AND DEATHS

The charge for insertion announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

BIRTH

KAHAN.—On February 28, to Dr. Nest Kahan (*née* Thomas), wife of Dr. Alexander Kahan, a daughter.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 15 1941

A NEW TYPE OF TYPHOID AND PARATYPHOID VACCINE

BY

A. FELIX, D.Sc.

(From the Lister Institute and the Emergency Public Health Laboratory Service)

Anti-typhoid inoculation is one of the old-established immunizing procedures introduced in the relatively early days of the bacteriological era. The original method of making typhoid vaccine (Wright and Semple, 1897: Pfeiffer and Kolle, 1896) has survived essentially unchanged up to the present time, and the type of vaccine still employed most extensively consists of a suspension of bacterial bodies which have been killed by heat and preserved by the addition of phenol. A great number of different methods have been described, both before and after the war of 1914–18, with a view to increasing the immunizing power of the vaccine and reducing the unpleasant systemic reactions which follow the administration of typhoid vaccines of the ordinary type. Some of these modified vaccines were suspensions of bacterial bodies killed by various chemicals instead of by heat, others were bacteria sensitized by treatment with homologous immune serum, while still other modifications consisted of bacterial extracts prepared in a great variety of ways (for references see Gay, 1918; Fleming and Petrie, 1934). These numerous types of typhoid vaccine were, however, all abandoned, since none of them was found to be superior to the ordinary vaccine made by the simple and time-honoured method of heat-killing and phenol-preservation.

Practical advances in anti-typhoid immunization, long delayed, have recently been made in quick succession as a result of our newer knowledge of the antigenic structure of the typhoid bacillus and of the different significance of different antibodies. Of the two typhoid antigens that were first differentiated the somatic O antigen is an important immunizing agent, while the flagellar H antigen is not (Felix, 1924: Arkwright, 1927; Topley, 1929: Schütze, 1930). Arkwright (1927), in an admirable discussion of the Army Council Report of the Anti-typhoid Committee (1912), showed that its main conclusions with regard to the preparation of typhoid vaccine were accounted for by the fact that the committee concentrated its attention almost entirely on one test as an index of immunity—namely, the measurement of the agglutinins produced by the inoculation of rabbits and man. The only typhoid agglutinin that could be estimated at that time was, however, the H agglutinin, and it is now known that the corresponding antigen is of little, if any, importance in the production of immunity.

Grinnell (1932) showed that the mouse is a suitable experimental animal for virulence and protection tests with the typhoid bacillus, and that the Rawlings strain—the classical laboratory strain used for more than thirty years in the preparation of typhoid vaccine in this and many other countries—had lost its immunizing capacity, although the cultures still possessed most of the commonly accepted criteria of smoothness. Perry, Findlay, and Bensted (1933a, 1933b, 1934a, 1934b) demonstrated in numerous experiments on mice that the degree of protection afforded by a typhoid vaccine was closely related to the virulence of the culture employed in its preparation. These workers also succeeded in "rejuvenating" the old Rawlings strain. It is now generally recognized that smooth mouse-virulent cultures of the typhoid bacillus possess the two antigenic constituents known as the O and the Vi antigens and that these are the essential elements which determine the immunizing capacity of typhoid vaccines (Felix and Pitt, 1934).

The balance of evidence obtained from active and passive protection experiments in mice indicates that the Vi antigen is the more effective prophylactic agent. At the same time reports have accumulated from various parts of the world showing that strains of the typhoid bacillus when freshly recovered from the blood culture invariably contain the Vi antigen, which, however, is gradually lost on subculture on ordinary media (Craigie and Brandon, 1936; Bensted, 1937, 1940). Earlier reports on the isolation from the blood of typhoid patients of strains devoid of the Vi antigen—for instance, that published by Felix, Krikorian, and Reitler (1935)—were probably incorrect and resulted from inadequate methods of growing and testing the cultures. It seems justifiable, therefore, to assume that the prophylactic value of typhoid vaccines has been greatly increased in recent years by the employment of selected strains which are particularly rich in the Vi antigen.

The Case for Changing the Old Method of Making Typhoid Vaccine

Why, then, it will be asked, should a new type of typhoid vaccine be suggested? It is perhaps not out of place to quote here two remarks from Gay's (1918) excellent monograph on typhoid fever: "It may well be questioned why further modification of typhoid vaccine

should seem necessary in view of the extremely good protective results that have already been obtained in certain large groups of individuals. . . . The only answer to such questions is and must ever remain that theoretical considerations based on the understanding of underlying principles will ever precede all practical advances" (p. 163). There can be little doubt that present-day methods of anti-typhoid immunization do not yet afford protection of a degree comparable to the immunity acquired by recovery from the disease. Gay's remarks seem to be as much to the point now as they were at the time they were written, nearly a generation ago.

The available knowledge of the properties of the Vi antigen clearly indicates that it is a remarkably labile substance which suffers very considerable damage by the treatment to which it is subjected in the customary processes of making typhoid vaccine. Sera from rabbits or horses immunized with suspensions of Vi strains sterilized by heating to 58° C. or by 0.5% phenol contain either no Vi antibody or only negligible amounts of it. Such sera are much less effective in protecting mice against virulent O + Vi bacilli than are sera which have been prepared by immunization with living bacilli and contain demonstrable Vi antibody. Treatment with formalin, such as that employed in the preparation of Grasset's (1939) "endotoxoid" vaccine or the mixture of T.A.B. vaccine and tetanus toxoid suggested by Ramon (1939) and Maclean and Holt (1940), so alters the Vi antigen that the resulting antibody exhibits a peculiar "functional deficiency," which is characterized by a reduced power of promoting phagocytosis and of protecting mice passively against infection with virulent strains of the typhoid bacillus (Felix and Bhatnagar, 1935). On the other hand, alcohol-treated suspensions stimulate in the rabbit or the horse the production of a Vi antibody which possesses the full functional efficacy of the antibody induced by immunization with the "natural" Vi antigen in living Vi strains (Felix and Petrie, 1938).

When mice are actively immunized, instead of passively protected by the injection of immune serum, the results are entirely different. In mice, vaccines sterilized in different ways induce an active immunity against infection with a virulent strain so long as cultures containing the Vi antigen are employed in the preparation of the vaccine. Schütze (1936) compared ten different methods of sterilization, including the standard method of heating to 53° C. for seventy minutes with the subsequent addition of 0.5% phenol, and found all of them of equal value in the active immunization of mice. Other workers have recorded similar results, and active-protection tests in mice are now employed in most laboratories as the sole method of assessing the protective value of typhoid vaccines. The demonstration of circulating antibodies in a suitable animal or in man, by using the serum to passively immunize mice, is not generally held to indicate the real protective value of a vaccine, and most workers discard it as unnecessary, though this technique appears to me to be of fundamental importance. The position is reminiscent of that already referred to when, in the early days of typhoid vaccination, agglutination tests were used as the sole criterion of immunity response, to the exclusion of the other suggested tests which were more difficult to perform, such as the estimation of the lytic or opsonizing power of the serum, or protection tests in the guinea-pig.

It is recognized that active antibacterial immunity depends mainly on the increased power of the tissues to elaborate specific antibodies rapidly when infection occurs, and the titre of the circulating antibodies that is found in the individual animal or man before the stimulus of infection occurs is not a reliable measure of this power. To that extent it is probably correct to state that active antibacterial immunity is independent of circulating antibodies. It is, however, equally well established that both the increased cellular reactivity and the circulating antibody owe their existence to the specific stimulus of the same substance—namely, the specific bacterial antigen. Thus it is also correct to state that in order to induce good active immunity the vaccine used must contain the specific antigen in that form which most effectively stimulates the increase of both cellular reactivity and the circulating antibody. Recovery from the disease, it is known, produces both these signs of immunity response.

It has been mentioned already that the active immunity experiments in mice do not disclose those great differences in the antigenic value of various preparations of the Vi antigen which are so clearly demonstrated by using the serum of vaccinated rabbits or horses in passive-protection experiments with mice or even by *in vitro* laboratory tests. This may perhaps be due to the fact that the typhoid bacillus is not a natural pathogen of the mouse. The customary anti-immunity test in the mouse therefore does not represent a sufficiently sensitive method of testing different preparations of typhoid antigens, and certainly should not be accepted as the sole test. It is obvious that in comparative tests of this kind all available methods should be employed in order to detect how far the immunizing properties of the various vaccines have been preserved or impaired. At present the position seems to be unsatisfactory, since the greatest care is taken to include in the vaccine only cultures that are particularly rich in the Vi antigen but very little is done to ascertain that this substance is being preserved in its most efficient form.

Methods of Assaying the Protective Value of Different Types of Typhoid Vaccine

Three distinct methods are available for carrying out comparative tests of different types of typhoid vaccine, as follows: (1) Active immunization of mice. (2) Immunization of rabbits with a view to establishing: (*a*) whether circulating Vi and O antibodies are readily elaborated; (*b*) whether the Vi antibody produced possesses full functional efficacy or belongs to the variety which is deficient in opsonizing and protecting power. (3) Tests of the Vi and O antibody responses in man.

Technical details cannot be discussed here. The tests are essentially identical with those employed in the estimation of the potency of therapeutic anti-typhoid sera, and have been described in detail (Felix, 1938). A few remarks only need be made concerning the practical application of the various tests.

1. Active immunization of mice is the least sensitive test. A vaccine that has been found to be of low protective value in this test should be condemned, and need not be further examined.

2*a*. The antibody response in the rabbit is estimated by Vi and O agglutination tests. It has been shown, in work already referred to, that in sera prepared against living Vi bacilli the Vi agglutinin titre runs approximately parallel with the protective power against living virulent bacilli, while the O agglutinin titre in all sera that contain the O antibody runs, on the whole, parallel with the protective power against the toxic action of killed typhoid bacilli. Thus the two agglutinin titres provide a trustworthy measure of the protective activities of the two antibodies, and the complicated protection tests can be safely replaced by the relatively simple agglutination reaction.

2*b*. The functional efficacy of the Vi antibody is examined in passive-protection tests in mice or in phagocytosis experiments (Felix and Bhatnagar, 1935).

3. A vaccine that has successfully passed the tests specified under paragraphs 1 and 2 should be submitted to the final

test of its capacity to induce the formation of Vi and O agglutinins in man.

So far this more severe method of assaying the efficacy of typhoid vaccines by tests in the mouse, the rabbit, and man has not been adopted by the majority of the workers engaged in the preparation of typhoid and paratyphoid vaccines. Rainsford (1937, 1939) experimented with typhoid vaccines sterilized by silver nitrate or sodium merthiolate and tested them in the manner outlined here. His experiments, however, were interrupted by the outbreak of the war before reaching the final stage of testing the efficacy of the vaccines in the inoculated human subject.

Experiments with Alcohol-killed Typhoid Vaccine

As soon as it was found that alcohol-killed typhoid bacilli stimulated in the rabbit abundant Vi antibody of full protecting and opsonizing power (Felix and Pitt, 1936; Felix and Petrie, 1938) an experiment was arranged to test for antibody response to such vaccine in the inoculated human subject. With the kind co-operation of Dr. W. D. Nicol, medical superintendent of the Horton Mental Hospital, 50 female mental patients were given three doses of the vaccine by the subcutaneous route, and another group received large doses of the same vaccine by the mouth. Samples of blood were taken in each case before the first dose and again eighteen days after the third dose, and the sera were examined in parallel by agglutination tests, using as reagents the same batch of agglutinable suspensions. Any rise in agglutinin titre corresponding to an increase of 100% or more was taken as "significant." The results of the O and Vi agglutination tests are summarized in Table I.

TABLE I.—*Percentage of Cases showing a Significant Increase in O and Vi Agglutinins after Immunization with Alcohol-killed Typhoid Vaccine containing no Preservative*

	No. of Organisms in Dose	No. of Immunized Persons in Group	Percentage Frequencies of Significant Increase in Titres	
			O	Vi
Subcutaneous inoculation	1st dose, 2,000 × 10^6 2nd ,, 3,000 × 10^6 3rd ,, 3,000 × 10^6	50	93.0	43.0
Oral administration	1st dose, 60,000 × 10^6 2nd ,, 80,000 × 10^6 3rd ,, 80,000 × 10^6	44	31.9	4.5

It is seen from the table that the results obtained were very encouraging indeed, since the subcutaneous inoculation of the vaccine had induced a detectable rise in O antibodies in nearly all and of Vi antibodies in nearly half the inoculated. Though the doses were larger than those employed in the customary T.A.B. inoculation the reactions following the alcohol-killed vaccine seemed to be much less severe. The table also shows that the oral administration of very large amounts of the vaccine, which was given on the empty stomach in the form of a saline suspension without the addition of bile, only led to very feeble stimulation of either the O or the Vi antibody.

The vaccine used in this experiment did not contain any preservative. The bacilli were killed by treatment with 75% alcohol; the latter was then removed by centrifuging and washing with saline, and the bacillary bodies were made up to the required opacity with saline alone. However, re-examination of samples of this vaccine after storage for half a year in the cold room, in saline alone or with the addition of 0.5% phenol or 0.35% tricresol, gave the disappointing result that each of the samples had almost entirely lost the capacity of stimulating formation of Vi antibody in the rabbit, though O antibody invariably was produced to high titre. This alcohol-killed vaccine could therefore not be recommended for use in large-scale inoculations, since a vaccine must contain a preservative capable of protecting it from casual contamination. Freshly prepared alcohol-killed vaccine containing no preservative was, however, employed during the past few years for the immunization of those amongst the personnel of the Lister Institute who were often handling virulent typhoid bacilli, and the impression gained in the course of time was that the reactions following the inoculations were less severe than those produced by the customary heat-killed and phenol-preserved vaccine. The experiments referred to were not published, but were recorded in the Annual Report of the Lister Institute for 1937.

Alcohol as a Preservative of Typhoid Vaccine

During the present war experiments with the alcohol-killed vaccine were continued, and the suggestion was made by Prof. G. S. Wilson of the Emergency Public Health Laboratory, Oxford, that alcohol might serve not only for the sterilization of the vaccine but possibly also for its preservation. This suggestion was soon found to be most valuable.

Long experience of alcohol-killed suspensions of the typhoid bacillus had proved beyond any doubt that a solution containing 75% absolute alcohol and 25% normal saline was a most reliable bactericidal agent. Large quantities of typhoid vaccine sterilized in this way and suspended in saline had been employed during the past few years for the immunization of horses in the course of the preparation of therapeutic anti-typhoid serum (Felix and Petrie, 1938), and in no instance did sterility tests on the numerous batches of vaccine prepared disclose the survival of either typhoid bacilli or other organisms.

The disinfectant action of alcohol was now compared with that of 0.5% phenol, using *Staphylococcus aureus* as the test organism. The comparative tests, which need not be described here in detail, were conducted both in saline alone and in saline containing 2,500 millions of alcohol-killed T.A.B. bacteria per c.cm. The clear-cut result was that the disinfectant action on *Staph. aureus* of 25% alcohol was slightly stronger than that of 0.5% phenol, while that of 20% alcohol was slightly weaker.

Next the effect of the subcutaneous injection of saline containing 25 or 30% alcohol was tried out on me and on a few volunteers. The injections of 0.5 or 1 c.cm. of these solutions were felt as a sting lasting for a fraction of a minute, but did not cause any local or general reaction. It was therefore decided that 25 or 22.5% alcohol could be employed as a suitable preservative of typhoid vaccine.

Batches of T.A.B. and T.A.B.C.* vaccine were prepared for experiments in rabbits and for comparative trials in human subjects. Two different vaccines were made in each case, both equivalent in composition and total bacterial count to the customary T.A.B. or T.A.B.C. vaccine—i.e., 2,500 million organisms per c.cm.—but prepared by one of the following two methods: (*a*) sterilized by treatment with 75% alcohol and preserved in saline containing 25% alcohol; (*b*) sterilized by treatment with 75% alcohol, washed on the centrifuge with saline, and preserved in saline containing 0.5% phenol. At the same time a quantity of the alcohol-killed typhoid suspension that served as one of the components of the mixed vaccines was retained for further experiments in

* Under the Therapeutic Substances Regulations the denomination T.A.B.C. now signifies in this country a vaccine containing typhoid bacilli along with paratyphoid bacilli of Types A, B, and C, and not, as previously, a vaccine containing typhoid bacilli and paratyphoid bacilli of Types A and B plus the vibrio of cholera; this latter vaccine is now known as T.A.B. + cholera.

rabbits, divided into five equal portions, and suspended in: (1) saline, (2) saline + 0.5% phenol, (3) saline + 25% alcohol, (4) saline + 30% alcohol, and (5) saline + 50% alcohol. All the vaccines were stored in the cold room at 1° to 2° C. and were tested for antibody response in rabbits and in human subjects after various intervals of time. The comparative trials in man are described in a paper by Felix, Rainsford, and Stokes that will appear in the next issue of the *Journal*. The experiments in rabbits are summarized in Tables II and III.

TABLE II.—*Typhoid Vi Antibody Response in Rabbits Immunized with T.A.B. and T.A.B.C. Vaccines*

Vaccines Sterilized with Alcohol			No. of Rabbits in Group	No. of Rabbits Showing Significant Increase in Vi Agglutinin Titre				Average Vi Agglutinin Titre after First and Second Intravenous Injections
Batch	Stored at 1° to 2° C. for	Preserved with		After Subcutaneous Injection of		After Intravenous Injection of		
				0.5 c.cm.	1 c.cm.	1 c.cm.	2 c.cm.	
T.A.B.	4 months	Phenol	3	0	0	0	0	
		Alcohol	3	0	0	3	3	1 : 20
T.A.B.C.	1 month	Phenol	3	0	0	1	1	1 : 3
		Alcohol	3	0	0	2	2	1 : 7

Table II shows that one of the alcohol-killed vaccines that had been preserved with phenol failed to stimulate Vi agglutinin, while the other induced formation of Vi agglutinin in only one out of three rabbits, whereas the two alcohol-preserved vaccines did so in five out of six. It is seen from the table that Vi antibody was in no instance demonstrable after the two subcutaneous injections, but made its appearance only after intravenous injection of a dose identical with the maximum dose that is employed in the customary subcutaneous inoculation of adult men, making no allowance for the difference in body weight. This fact is noteworthy in view of the results—discussed in the subsequent paper—which were obtained in human subjects inoculated with these four batches of vaccine. On the other hand none of the twelve rabbits failed to show a significant rise in the typhoid O agglutinin even after the first subcutaneous dose. At each stage during the immunization of the rabbits the average typhoid O titres were much the same in the four groups—namely, about 1 in 500 after the first subcutaneous injection, about 1 in 1,000 after the second subcutaneous injection, and about 1 in 5,000 after the first intravenous injection. In this and the following experiment the rabbits were inoculated at weekly intervals and the samples of blood were taken on the seventh day following each immunizing injection. The degrees of agglutination that have been employed to indicate the O and Vi titres respectively were identical with those used in the examination of the sera from inoculated human subjects, and are defined in the subsequent paper.

TABLE III.—*Vi Antibody Response in Rabbits Immunized with Variously Preserved Typhoid Vaccines*

Alcohol-killed Typhoid Vaccine Stored for 9 Months at 1° to 2° C. Suspended in	No. of Rabbits in Group	No. of Rabbits Showing a Significant Increase in Vi Agglutinin Titre after Intravenous Injection of		Average Vi Agglutinin Titre after Intravenous Injection of	
		500 · 10^6 Organisms	1,000 · 10^6 Organisms	500 · 10^6 Organisms	1,000 · 10^6 Organisms
Saline	4	2	2	1 : 4	1 : 10
Saline + 0.5% phenol	4	1	1	1 : 2.5	1 : 2.5
Saline + 25% alcohol	4	4	4	1 : 20	1 : 80
Saline + 30% alcohol	4	4	4	1 : 10	1 : 50
Saline + 50% alcohol	4	4	4	1 : 35	1 : 90

Table III corroborates the observation, already referred to, that the capacity of the alcohol-killed vaccine to stimulate Vi antibody formation deteriorates on storage in saline with or without the addition of 0.5% phenol. At the same time the table clearly demonstrates that the presence of alcohol in the vaccine prevents this deterioration taking place for at least nine months, and probably for much longer. It is also seen that 25% alcohol seems to be as effective in this respect as the two higher concentrations tested, though the latter conclusion may have to be modified after observation over a longer period of time. Again, there was no significant difference in the O antibody response to the five different vaccines. Each of the twenty rabbits produced abundant O antibody, and the average titres in the five groups were of the same order—about 1 in 5,000 after the second dose of vaccine.

The Vi Antigens of Bact. paratyphosum A, B, and C

A few remarks must be made here on the other three constituents of the mixed typhoid and paratyphoid vaccine. Some time ago *Bact. paratyphosum* A and B were found to possess specific Vi antigens of their own (Felix and Pitt, 1936), while *Bact. paratyphosum* C contains a certain amount of the specific Vi antigen of the typhoid bacillus (Kauffmann, 1935). So far most workers have paid very little attention to these findings, because the presence of these antigens in cultures of paratyphoid A, B, and C bacilli has much less striking effects on their virulence, agglutinability, and immunizing properties than the typhoid Vi antigen has on the typhoid bacillus.

Experiments carried out in collaboration with Miss R. M. Pitt before the war, but not yet published, strongly suggest that the heat-labile somatic antigens of paratyphoid A and B bacilli have chemical properties essentially similar to those of the typhoid Vi antigen, though they differ from the latter in certain respects. These antigenic components must therefore be recognized as separate and distinct entities, quite different from the heat-stable somatic O antigens of paratyphoid A and B bacteria. In experiments on passive immunization of mice pure Vi serum has a powerful protective action against virulent paratyphoid B bacilli, and the same is probably the case with paratyphoid A bacilli, though experimental evidence on this point has not yet been published.

From this brief summary of the experimental data three conclusions of practical importance in the preparation of T.A.B. or T.A.B.C. vaccine seem to be quite obvious: (*a*) The cultures of paratyphoid A and B bacilli to be included in the vaccine should contain maximum amounts of both the O and the Vi antigen. (*b*) Treatment with alcohol, instead of with heat and phenol, is likely to enhance the protective power of the vaccine against infection with paratyphoid A or B bacilli, though the advantage may not be of the same magnitude as it is in the case of the typhoid bacillus, since heat-killed or phenolized suspensions of paratyphoid A or B bacilli do stimulate circulating Vi antibodies in the rabbit. (*c*) If, for special reasons, paratyphoid C bacteria also are included in the vaccine, further advantage is gained by selecting a strain which possesses the specific Vi antigen of the typhoid bacillus and by treating it with alcohol.

Technique employed for the Preparation of Alcohol-killed and Alcohol-preserved Vaccine

This technique is very simple indeed. The growth on plain agar from Roux bottles of the usual size is washed off with 20 c.cm. of sterile saline per Roux bottle, the suspensions are collected in flasks containing glass beads, and a count or estimation by opacity is made. The growth from one Roux bottle, 8½ in. by 4½ in., usually yields about 1,500,000 × 10^6 organisms of the typhoid

and paratyphoid strains employed, varying according to the quality of the agar medium. Absolute alcohol is added to the suspensions in the proportion of 60 c.cm. of absolute alcohol to 20 c.cm. of saline. The flasks, which now contain the bacterial suspensions in 75% alcohol, are kept for two days at room temperature in the dark and are repeatedly shaken during that time.

The time required for the sterilization of the suspensions is very short—probably to be measured in minutes rather than in hours—nevertheless it is advisable to prolong the treatment for forty-eight hours and to ensure very thorough shaking. It is well known that absolute alcohol is a very poor disinfectant, and it might be feared that some contaminants, especially spore-bearing organisms, might gain access to the suspensions with the alcohol. It has been mentioned already that treatment with 75% alcohol for forty-eight hours at room temperature has invariably accomplished sterilization of each batch of vaccine that has been prepared up to the present time, without previous sterilization of the commercial absolute alcohol.

On the morning of the second day of the treatment with 75% alcohol the supernatants are decanted or sucked off, and the sediments are resuspended in the same quantities of fresh 75% alcohol and allowed to stand for some hours, until the bacteria have settled down completely. The solution of 75% alcohol – 25% saline to be used for this purpose should be prepared at least two days in advance and kept at room temperature, to ensure sterilization of the commercial absolute alcohol. The second supernatants are then sucked off as completely as possible. This procedure removes from the suspensions most of the constituents, mainly broth, which may have been collected from the agar medium together with the bacterial growth.

The deposits now consist of about a tenth to a fifth of their volume of solid bacteria and the remaining part of 75% alcohol. The amount of alcohol present in the deposits is estimated approximately and an appropriate adjustment is made while the dilute alcohol is being prepared, so that the deposits are finally suspended in saline containing 22.5% alcohol. This dilute alcohol should be prepared from a stock dilution of 75% alcohol which has been stored at room temperature for not less than two days. The suspensions of the three or four strains that are to be incorporated in the vaccine are then tested for sterility and again counted by opacity or some other method, and the final product is made by mixing the calculated quantities of the various suspensions and further diluting with 22.5% alcohol.

Attention must be paid to the fact that suspensions of alcohol-killed typhoid or paratyphoid bacteria have an opacity considerably less than that of suspensions equivalent in number of bacteria but killed by heat and preserved with phenol. The difference in opacity is about 10 to 20%, and is accounted for partly by the destruction of the flagella and partly by some alteration in the physical condition of the surface of the bacteria.

The methods used for the selection of the most suitable strains and the preservation and maintenance of the cultures have been described in detail in previous papers. Freshly isolated strains of typhoid and paratyphoid bacilli are not necessarily the best source of the antigens that are essential in the make-up of a potent vaccine. Though many strains at the time of their isolation are highly virulent and possess the Vi antigen in maximum amount, only few have the ability to maintain it at a high level when subcultured on artificial media. The strains employed in the present experiments—*Bact. typhosum* strain Ty 2, *Bact. paratyphosum* A strain HA 6, *Bact. paratyphosum* B strain HB 3, *Bact. paratyphosum* C strain K 32 (Kauffmann)—are all known from earlier work, and the first three strains have been chosen for their outstanding ability to produce Vi antigen in maximum amount when grown on plain agar for periods of many years.

The routine examination of the cultures consists of agglutination tests alone, using pure O and pure Vi sera. Occasionally the precaution is taken to check the results by virulence tests in the mouse. Bensted (1937), who has had much experience of such tests, found that the estimation of the Vi content of typhoid cultures by agglutination tests was often a more accurate guide in observing slight differences in virulence than the actual mouse test itself, unless large numbers of animals were employed.

The important discovery made by Craigie and Yen (1938) of type-specific typhoid Vi phages also must be mentioned in connexion with the problem of selecting the typhoid strain or strains for inclusion in the vaccine. It is known that by means of these phages Craigie succeeded in dividing typhoid strains from different sources into a number of different types. In view of the striking stability of these phage types it was considered necessary to investigate whether serological differences could be detected in the Vi antigen of typhoid strains belonging to different phage types. The experiments included cross-agglutination and cross-absorption tests, and phagocytosis and passive-protection tests in mice, and were completed in collaboration with Miss R. M. Pitt before the war but are not yet published. No difference between the actions of homologous or heterologous phage-type sera could be disclosed by any of these methods, and it appears to be safe to continue employing a single strain of the typhoid bacillus for making typhoid vaccine.

Summary

Ordinary typhoid-paratyphoid vaccine killed by heat and preserved with phenol stimulates in the rabbit and in man only negligible amounts of demonstrable typhoid Vi antibody.

Alcohol-killed vaccine readily stimulates circulating typhoid Vi antibody when injected intravenously into the rabbit, and induces its formation in nearly 50% of human beings after subcutaneous inoculation. This Vi antibody possesses its full opsonizing and protecting power.

Alcohol-preserved vaccine still contains typhoid Vi antigen in its effective form after storage in the cold for at least nine months, and probably much longer.

The technique of the preparation of alcohol-killed and alcohol-preserved T.A.B.C. vaccine is described.

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HEPATOTROPHIC AND CARDIOTROPHIC PROPERTIES OF SEX HORMONES

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In earlier papers by Korenchevsky and co-workers (1933–40) the manifold effects produced by sex hormones on the non-sex organs have been repeatedly emphasized on the basis of (1) the changes in weight of the organs of gonadectomized rats as compared with those of normal intact animals; (2) the changes in weight of the organs of rats injected with various sex hormones as compared with those of uninjected litter-mates. The microscopical changes produced in some of the non-sex organs of the rats described in these papers have been examined, and the literature on the subject reviewed in the case of adrenals of males and females (Hall and Korenchevsky, 1938b; Hall, 1940), liver of males (Hall and Korenchevsky, 1938a), and kidneys of both sexes (Korenchevsky and Ross, 1940).

In the present paper the weights of the liver and heart of 281 male and 503 female rats from all our experiments, published and unpublished, have been divided into three series according to age and duration of hormone administration, and the data from each series have been pooled and statistically analysed. The other methods of examination of the organs are given below. In the experiments on females special attention has been paid to two male hormones, androsterone and transdehydroandrosterone, since both are naturally present in the female organism (Callow, 1936; Callow and Callow, 1938); and in the experiments on males to the effects of oestrogens, since large quantities of oestrone have been found in male urine (Häussler, 1934; Deulofeu and Ferrari, 1934, 1935; Zondek, 1934; Cartland, Meyer, Miller, and Rutz, 1935; Girard, 1938), and oestrone and oestradiol have been isolated in the pure form and in large quantities from the testes (Beall, 1940).

Technique

The general technique has been described in previous papers. The male rats have been grouped as follows: Series I and II (Table I) include experiments of 20 to 24 days' (in most cases 21 days') duration on rats aged 71 to 100 days (Series I) and 101 to 150 days (Series II). Series III refers to rats 137 to 177 days old injected with sex hormones for a longer period, varying from two to four, mostly three, months. Series I to III of the experiments on female rats (Table II) correspond in length of treatment to those on males, but the ages of the animals were 60 to 85 days (Series I), 86 to 125 (Series II), and 110 to 214 days, mostly about 150 days (Series III). The following hormones were used in the doses stated (mg. per week):

	Series I and II	Series III
Male Hormones		
Androsterone	6.3–25.2	7.5
Androstanediol	2.45–25.2	—
Transdehydroandrosterone	7.0–28.0	7.5
Testosterone pure	1.17–10.5	0.75–7.5
Testosterone P (propionate)	1.17–10.5	0.75–7.5
Testosterone D (dipropionate)	1.05–10.5	7.5
Δ^4-androstenedione	3.5–21.0	—
Female Hormones		
Oestrone	0.014–0.024	—
Oestradiol D (dipropionate) or BB (3-benzoate-17-n-butyrate)	0.018–0.09	0.018–0.2

In the tables a particular male or female hormone or a special dose is noted only when this hormone or dose had a considerably different effect on the liver or heart; the doses given in the tables are in mg. per week.

Sections were stained with haematoxylin and eosin and, when necessary, Masson's trichromic stain and scharlach red, and the usual microscopical investigation was made. In addition, in order to compare the size of the liver cells, the same technique of counting the number of cells in an area of known size with the aid of a camera lucida was used as in our previous paper (Hall and Korenchevsky, 1938a). In the present paper the cells were counted at a lower magnification than in the previous one; in this way a larger number of cells were contained in the measured area, which, it was felt, would lead to greater accuracy in the results. In Series I and II, Table I, the data for the number of cells are taken from our previous paper and multiplied by 2 in order to make them comparable to the figures of Series III.

In order to measure the heart-muscle fibres a technique was used similar to that described in our paper on kidneys (Korenchevsky and Ross, 1940). Longitudinal fibres were outlined on a measured area of paper (7.5 × 12.5 cm.), which had been previously weighed; the intermuscular spaces were then cut away, and the paper replicas of the fibres thus obtained were weighed. This weight was corrected to a standard weight of the paper, since different sheets and even different parts of the same sheet were found to vary in weight. Five areas from each heart were drawn and weighed in this way, and the average obtained represented the measurement of the muscle fibres. These measurements of liver cells were made in about a half, and of heart fibres in about one-third, of the total number of rats.

The technique used on the isolated hearts of rats will be described in detail elsewhere.

Statistical Treatment of the Results.—The data presented in the tables which follow were analysed by one of us (J. Cohen) by means of Fisher's t-test (Fisher, 1936). For the sake of simplicity the statistical significance (abbreviated "S.S.") is briefly given in the appropriate places in brackets. Thus "(S.S. 1:100)," for example, means that the observed difference between the means of two groups could occur by chance less than once in 100 such experiments. Not all the differences attain the same level of significance. The majority by far would have occurred less than once in 100 cases in random sampling. Many, however, would have occurred less than once in 1,000 or even 5,000 cases. All the instances where the statistical significance reaches or exceeds the level of 1 per 1,000 (by chance) are expressed as "S.S. 1:1,000."

Changes in Body Weight and Fat Deposition.—These changes are given in Tables I and II. They will not be discussed in detail here, but as they might have a considerable effect on the changes in weight and size of the organs they will be referred to, when necessary, in order to understand the mechanism of the weight changes in the liver and heart.

Effect of Gonadectomy

It is necessary to remember that in general, as compared with normal controls, castrated rats become lighter (S.S. 1:100) and ovariectomized rats heavier (S.S. 1:100–1,000), the changes usually becoming most clear during the later periods after gonadectomy, when there is also a tendency in most animals to increased fat deposition.

The liver in males becomes lighter both in actual weight (S.S. 1:100–1,000) and per unit of body weight (S.S. 1:20–1,000), whereas in females only the latter weight decreases (Series II and III, S.S. 1:1,000), the actual weight remaining unchanged or even slightly increasing. It is

* Dr. Korenchevsky desires to express to Oxford University, to Prof. E. S. Goodrich, and to Prof. J. A. Gunn his own and the Lister Institute's gratitude for the kind hospitality extended to him and his co-workers in the Department of Zoology and Comparative Anatomy and the Nuffield Institute for Medical Research.

TABLE I.—*Effect of Sex Hormones on Body Weight, Retroperitoneal Fat, Liver, and Heart of Male Rats*

No. of Series	Group of Rats	No. of Rats	Final Body Weight (gm.)	Weight of Retroperitoneal Fat (gm.)		Liver			Heart		
						Weight (gm.)			Weight (mg.)		
				Actual	Per 200 gm. of Body Weight	Actual	Per 200 gm. of Body Weight	No. of Cells*	Actual	Per 200 gm. of Body Weight	Paper Replicas of One Muscle Fibre†
I	1. Normal controls	26	325	12	7	12.25	7.56	114	911	563	—
II	2. " "	14	380	12	6	13.48	7.14		1,027	549	—
III	3. " "	14	436	16	7	12.93	5.95	107	1,136	522	25
I	4. Castrated controls	33	297	12	8	10.17	6.59	112	829	557	—
II	5. " "	25	327	13	8	9.72	5.93		865	529	—
III	6. " "	13	377	18	9	10.42	5.51	119	934	496	22
	Castrated rats injected with:										
III	7. Oestradiol D	10	246	10	8	9.41	7.62	129	847	694	23
I	8. Male hormones	71	315	12	8	12.23	7.77	142	938	593	—
II	9. " "	14	330	12	7	11.65	7.09		991	603	—
III	10. " " (weak doses of hormones)	15	398	17	9	12.74	6.40	112	1,115	561	24
III	11. " " (large dose of testosterone P)	7	335	9	5	11.15	6.64	111	1,127	673	26
I	12. " " +oestrone	16	280	10	7	9.52	6.84	124	825	591	—
III	13. " " +small dose of oestradiol D	11	313	13	8	11.42	7.32	124	976	623	22
III	14. " " +large dose of oestradiol D	12	240	7	6	8.69	7.27	135	822	690	23

* The greater the number of cells in the measured area the smaller they are, and vice versa. † The heavier the replicas, the larger the muscle fibres.

TABLE II.—*Effect of Sex Hormones on Body Weight, Abdominal Fat, Liver, and Heart of Female Rats*

No. of Series	Group of Rats	No. of Rats	Final Body Weight (gm.)	Weight of Abdominal Fat (gm.)		Liver			Heart		
						Weight (gm.)			Weight (mg.)		
				Actual	Per 200 gm. of Body Weight	Actual	Per 200 gm. of Body Weight	No. of Cells	Actual	Per 200 gm. of Body Weight	Paper Replicas of One Muscle Fibre
I	1. Normal controls	30	202	10	10	7.34	7.31	—	677	670	—
II	2. " "	10	232	18	15	8.25	7.15	—	726	623	—
III	3. " "	17	254	18	14	8.39	6.51	123	765	594	21
I	4. Spayed controls	45	237	12	10	8.77	7.50	—	718	619	—
II	5. " "	24	264	16	12	8.04	6.15	—	734	561	—
III	6. " "	17	328	23	14	9.23	5.63	126	799	492	21
	Spayed rats injected with:										
I	7. Oestrone	31	183	8	8	7.05	7.54	—	609	650	—
II	8. "	12	243	16	13	7.46	6.04	—	723	589	—
I	9. Oestradiol D 0.018	13	207	7	6	9.03	8.77	—	747	726	—
II	10. "	9	228	10	9	8.73	7.66	—	755	669	—
III	11. " D or BB 0.018–0.09	24	245	14	11	8.25	6.79	131	805	653	22
III	12. " D 0.2	9	183	6	7	6.71	7.18	145	596	641	20
II	13. " D or BB 0.018+rest 10–52 days	16	274	15	11	10.69	7.82	110	844	620	20
I	14. Male hormones	44	223	10	9	9.94	8.80	—	725	635	—
II	15. " "	6	252	—	—	9.63	7.68	—	720	574	—
III	16. Androsterone 7.5	4	339	20	12	11.39	6.75	120	928	548	24
III	17. Transdehydroandrosterone 7.5	4	303	19	12	9.81	6.36	120	768	499	21
III	18. Testosterone P 2.25	7	314	18	11	10.42	6.65	119	935	597	22
III	19. " P or D 7.5	10	278	11	8	10.75	7.77	111	970	701	23
I	20. Male hormones+oestrone	54	204	7	7	8.32	8.18	—	671	662	—
II	21. " "	19	263	16	12	8.46	6.47	—	767	583	—
III	22. Androsterone 7.5 + oestradiol D 0.018–0.09	14	269	14	10	9.83	7.32	131	913	670	22
III	23. Testosterone P or D+oestradiol D or BB 0.018–0.09	19	263	12	9	9.00	6.87	141	916	693	21
III	24. Testosterone P+oestradiol D 0.2	15	213	8	7	7.80	7.39	132	627	593	21

thus clear that in males castration has a depressing effect on the development of the liver. There are, however, no great histological changes in the liver in either sex. The size of the cells is unchanged or (Series III) only slightly decreased In several cases there is an increase, sometimes considerable, in the vacuolation of the cells and the content of lipoid granules.

Similar changes occur in the weight of the *heart*, but they are much less pronounced: in males the actual weight becomes significantly smaller (S.S. 1:100), in females only the relative weight (S.S. 1:1,000, in the later periods after ovariectomy). Histologically no definite changes in the structure of the heart were found, except, on the average, a slight decrease in the size of the muscle fibres in males.

Effect of Oestrogens

This was similar in both sexes. The depressing effect of oestrogens on growth and body weight has been shown by several workers, including ourselves, in our previous and present papers (in the present series S.S. 1:50–1,000 in experiments of short duration, 1:100 in those of long duration). In most cases there was also a depressing effect on fat deposition (S.S. 1:20–1,000).

The effect on the actual weight of the *liver* was not uniform or definite except with large doses injected for long periods (Table II, Group 12), in which case a considerable decrease in the actual weight of the liver (S.S. 1:1,000) was observed. It should be noted, however, that in all experiments with esters of oestradiol the relative weight was greater than that of control gonadectomized animals (S.S. 1:100–1,000), returning to or even exceeding the normal relative weight (Tables I and II). This fact suggests that oestrogens may in reality have a stimulating effect on the liver, which is produced in spite of, and is obscured by, the general depression of growth of the organism.

This stimulating effect on the liver was clearly demonstrated by the increase in both actual and relative weights of the organ (S.S. 1:100–1,000) and in size of the cells after administration of small doses of oestradiol esters with a rest interval of 10 to 52 days between the last injection and the date of killing (Table II, Group 13). This indicates that some of the toxic effects of oestrogens might be prevented by administering small doses of oestradiol esters with a mild action but prolonged activity.

This suggestion as to the stimulating effect of oestrogens appears to be contradicted by the results of the measurements of the liver cells, which in Groups 7 (Table I) and 7–12 (Table II) were slightly smaller in rats injected with oestrogens. When, however, sections of these livers were stained with scharlach red there was found to a great decrease in or disappearance of the lipoid droplets in the cells; this gives a very probable explanation of the discrepancy and of the cause of it, since disappearance of fat from the cells should result in a decrease in their size. In agreement with this is the fact that the livers of oestrogen-treated animals are always dark brown in colour, while those of normal and especially of gonadectomized control animals are much lighter. This appears to be due to the disappearance of fat from the cells in the former animals.

The effects of oestrogens on the weight of the *heart* in rats of both sexes are similar to those on the weight of the liver: while, as compared with gonadectomized controls, no constant or significant effect on the actual weight of the organ was noted, the relative weight was in most cases increased (S.S. 1:100–1,000). Measurement of the muscle fibres showed no significant change, nor were any other histological changes noted.

However, the presence of an increased amount of heart tissue per unit of body weight in oestrogen-treated animals might suggest, as in the case of the liver, a stimulating effect of oestrogens on the heart. In any case, in ovariectomized animals the relative weight of the heart, which in the gonadectomized uninjected controls was decreased, was restored by oestrogens to or above the normal level.

Effect of Male Hormones

In general the effects of the various compounds of male hormones on gonadectomized animals are similar, varying only in degree. They are shown more clearly in the experiments of longer duration, on which the conclusions are mainly based. For this reason, and for economy of space, the effects of the different male hormones are given separately in some of the longer experiments only (Series III).

Transdehydroandrosterone produces the weakest effect, testosterone propionate the strongest; androsterone, especially in females, possesses all the beneficial stimulating properties without producing in some organs (e.g., the uterus) pathological effects which appear after injections of testosterone propionate. Compared with gonadectomized control animals, (1) there was a decrease in body weight (S.S. 1:20–100) and fat deposition (S.S. 1:100) only with large doses of strong male hormones (testosterone propionate); (2) in both sexes androsterone and testosterone propionate produced hypertrophy both in actual and in relative weights of liver and heart. The hypertrophy was especially pronounced in the experiments of longer duration (S.S. 1:100–1,000 for liver, 1:100 for heart), but in most cases was significant even after a short period of injections in males (S.S. 1:100–1,000).

In comparing weights of heart and liver of gonadectomized injected rats with those of the intact uninjected controls (Group 1) an important difference between males and females appears: in males the weights of these organs were returned only to or towards normal (Table I); in females (Table II, Series III) they exceeded the normal level after injections of androsterone (S.S. 1:20–100) and testosterone propionate (S.S. 1:100). Thus, in gonadectomized females, as has already been described in the case of the weight of adrenals (Hall, 1940), the male hormones have also a *masculinizing effect* on the weights of liver and heart, which approach those of the males.

Histologically, in experiments of long duration androsterone and testosterone propionate, unlike oestrogens, produced slight hypertrophy of the liver cells in both sexes, when compared with gonadectomized uninjected controls, and of heart-muscle fibres in males. In females there appeared also to be a slight increase in the thickness of the muscle fibres with these hormones (Table II, Groups 16 and 19), but the difference in the figures was very small (paper replicas weighing 21 mg. in ovariectomized controls, against 23 to 24 mg. in the injected animals). Our rats were killed by bleeding and therefore the intermuscular spaces in the heart only very approximately can be considered to be occupied by blood vessels. When these spaces were compared as weighed paper replicas, the amount of vascular tissue was found in the case of males (Series III) to be as follows: castrated controls – 67 mg., and testosterone propionate – 75 mg. In females this difference did not appear. It appears, therefore, that the enlargement of the heart of males injected with male hormones can be explained by hypertrophy of muscular tissue, with probable hyperaemia and hypertrophy of vascular tissue. No other histological changes were found.

Effect of Male Hormones Injected Simultaneously with Oestrogens

When male hormones and oestrogens are injected simultaneously the effect of the latter dominates that of the former if large doses of oestrogens are used. Groups 14 in Table I and 24 in Table II provide good examples of this. Therefore all our statements made for oestrogens are valid also for the characterization of this action.

On the other hand, when the dose of oestrogens is comparatively small (up to 0.018 mg. per week in males—Table I, Group 13; and up to 0.09 mg. in females—Table II, Groups 22 and 23; compared respectively with Group 7 in Table I and Group 11 in Table II) the male hormones androsterone and esters of testosterone are able in most cases to neutralize some of the depressing effects of oestrogens on body growth (S.S. 1:100–1,000), liver (S.S. 1:20–1,000), and heart (S.S. 1:100).

It is necessary to emphasize one very important point—namely, that not only do the actual weights of the liver and heart in most cases exceed those of the control animals, but also the weights per unit of body weight. In females the relative weights of the heart exceed even those of the normal control animals (Groups 22 and 23 as compared with Group 3, S.S. 1:100–1,000). Therefore the addition of a small amount of oestrogens to the male hormones might in some cases (oestrogenic deficiency) increase the stimulating non-sexual properties of the male hormones, especially in females. From this point of view the natural occurrence of oestrogens in the organism, even of males, acquires a new significance in addition to their useful co-operative effect on the sex organs (see the literature and our own experiments on these organs in our previous papers, referred to below).

Effect of Male Hormones on the Isolated Heart of Castrated Rats (R. C. Burbank)

Several experiments were performed on the isolated heart of normal and castrated rats, and of castrated rats

* We are most grateful to Prof. C. Lovatt Evans for his criticism and advice to use statistical analysis for the results obtained.

injected with androsterone and testosterone propionate, in most cases for a prolonged period of two months. A detailed account of these experiments and of the technique employed will be published elsewhere. A preliminary statement is given here of the results obtained in 85 experiments on 46 male rats when the potential strength of the heart was measured in these three groups of rats. The measurements were made by attaching 10 and 15 gramme weights to the level pulled by the heart's contractions and tracing these contractions on a kymograph. The amplitude of the contractions was measured on the tracings and their number counted before and during the suspension of the weights, in both cases for a period of one minute. Woodworth's (1903, p. 228) quotient of the potential energy of the heart was used for expressing the results obtained, which have been statistically analysed by one of us (J. Cohen), using the same method as above.

These quotients of potential energy of the heart in the three groups of rats were as follows:

	Before Test	During Test
Control normal rats	81.3	73.5
Control castrated rats	71.9	60.0
Castrated rats injected with male hormones	78.2	81.7

A statistical analysis of the results obtained showed that during the "weight test" the hearts of the uninjected castrated control rats were weaker than either those of the uninjected normal controls (S.S. 1:50) or those of the castrated rats injected with male hormones (S.S. 1:100).

Thus the results on the isolated heart are in complete agreement with those obtained by weighing of the organs and their histological examination.

Summary and Conclusions

Experiments made with sex hormones on 281 male and 503 female rats are recorded, with the resulting effect on the weights and histological structure of liver and heart, and also on the isolated heart of 46 male rats.

Hepatotrophic and cardiotrophic properties are non-sexual effects of male hormones, especially of androsterone and testosterone propionate.

Taking into consideration also their nephrotrophic property, described in a previous paper, the male hormones in suitable doses might be considered as very important natural physiological stimulants of such vital organs as the liver, heart, and kidneys.

So far as it is permissible, from the results obtained on animals, to suggest a therapeutical application of sex hormones to human patients, it seems that androsterone and esters of testosterone should be tried clinically in suitable diseases of the liver, heart, and kidneys when a physiological stimulation of these organs is required.

We again emphasize the suggestion given in the paper on the clinical application of the sex hormones in kidney diseases that androsterone is preferable to the testosterone esters as a physiological stimulant of liver, heart, and kidneys in both sexes, since it produces only a weak effect on the male and female sex organs and is present naturally in both sexes. It is most inadvisable to stimulate the sex function in patients suffering from such grave diseases as those of the liver, heart, and kidneys.

There is also a possibility that small doses of some oestradiol esters with a prolonged and mild action (such as oestradiol benzoate-butyrate), administered with long intervals between the injections, may also be considered to produce stimulation of the liver, and perhaps of some other organs. Because of the toxicity of oestrogens in overdose, however, great caution is needed in their clinical application.

From this point of view, in cases of deficiency of oestrogens in the organism, the simultaneous administration of male hormones with oestrogens might be advantageous, since the former are able to neutralize to some extent the depressing and toxic effects of oestrogens.

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CHEMOTHERAPY AND CONSERVATISM IN ACUTE SUPPURATIVE OTITIS MEDIA

BY

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In the past have appeared many substantiated reports of striking results from sulphanilamide therapy, both in simple otitis and in suppurative otitis following paracentesis. An attempt is here made to assess its value in cases in which surgical intervention seemed to be urgent, but in which, nevertheless, it was purposely avoided.

Case I

A boy aged 9 returned to school with the remains of what had been called a common cold. There had been, however, an outbreak of "sore throat" in his family at the same time. He felt quite fit, and had a normal pulse and temperature, the only positive finding on physical examination being a subacute pharyngitis, the pharynx having the appearance of that seen the day following exfoliation in a moderately severe attack of scarlet fever. Eight days later he had had earache in the night, and the right drum was acutely inflamed in the upper half, while the postero-inferior quadrant was bulging with a bluish-grey sero-sanguineous sac extending into and resting on the adjacent canal. The left drum was normal. The temperature was 99° F., the pulse 90. Treatment with sulphanilamide was started. The sac quickly shrivelled up, leaving minute "puffs of cotton-wool" or "small snow-flakes" over the bulged area; the inflammation rapidly subsided, and in four days the drum was normal. On the following day the left ear started to behave in a manner similar to the right, responding to the same treatment in the same time. Deafness was only slight, and was very temporary.

Case II

The patient, a boy aged 8, following a cold two days previously, complained of bilateral earache which lasted the

whole night. In the morning his pulse was 114 and his temperature 101° F., while his pharynx was mildly inflamed. In both ears Shrapnell's membrane was inflamed and brightly injected; the normal contour and landmarks were obscured, but there was bulging of both tympanic membranes, in the postero-inferior quadrants—the right bluish grey, the left pinkish red. There was no mastoid tenderness. Local treatment was not considered necessary. Sulphanilamide treatment was begun immediately. Next morning the temperature had dropped to 98.8° F. and the pulse to 90, and his earache had gone. The sac in the left ear had shrunk a little; that on the right was slightly larger, until in the evening the whole canal was obliterated. On the third day the sac had become very much smaller, having a shrunken crenated appearance rather like that of a piece of dirty crumpled blotting-paper. It was now a quarter its original size; the normal contour of the drum was returning, and the outline of the malleus was visible, with the tip of the handle as a white knob. On the fourth day the right drum had reached the crenated stage, and was then a dirty cream instead of the previous bluish grey. On the sixth day both drums were approaching normality, but there was still some definite loss of lustre, with some brown staining of those areas which had previously been brightly injected, while over all were a few radial wavy dilated vessels. Hearing (as tested by a 30-in. watch), which had been impaired on the second day to the extent of Right $-\frac{1}{2}$ in. and Left $-2\frac{1}{2}$ in., was now normal. The normal pearly lustre and the tone of the drums were not recaptured till the eleventh day.

Case III

This patient, a girl aged 5, complained of earache within a few hours of the onset of a head cold. In the morning the temperature was 101° F., in the evening 104° F. The left drum showed a reddish-cream bulge in the postero-inferior quadrant, with a small bluish-grey bulla between the processus brevis and the sac. The fan-shaped area of acute inflammation and redness of the upper half of the drum was present as usual. Sulphanilamide treatment was instituted. On the following day the bulging was less marked, but the right drum showed streaking of the handle, with general flushing of the whole membrane. The temperature had dropped to 102.6° F. On the third day the left had quieted considerably, while the right showed a well-defined fan-shaped area or an arc, 4-7 o'clock, dirty white in the morning, changing to a deeper grey-white in the evening. The temperature was now 100° F., the pulse 96. On the fourth day the white arc had enlarged irregularly; it had become yellow and bulging, and definitely overhung the canal, with a few dilated vessels over the bulge. The fifth day saw a slight increase of the bulge, but the temperature was still dropping. On the sixth day the bulging was very much less, while the colour was a faint yellow with some streaks remaining. On the ninth day the left drum was normal in appearance except for some lack of lustre over the area originally affected. The right was pinkish. On the fifteenth day both drums were normal. Deafness was not appreciable at any stage, either to the whispered word or to a watch test, but with a child of this age it is notoriously difficult to place reliance on the latter test.

Case IV

A boy aged 9 had had acute otitis following measles one year previously. He was seen one evening half an hour after the onset of acute earache. The temperature was 99° F., pulse 96; both Shrapnell's membranes were inflamed—the right with three blackish bullae in the antero-inferior quadrant, the left with streaking of the handle. Sulphanilamide treatment was started. On the next morning the right canal was completely occluded by a bag almost inky black in colour. The temperature was then 98° F., and the earache was less. At 5 p.m. there was a discharge of blackish thin sero-sanguineous fluid from the meatus, while the earache was gone. Gentle cleansing revealed a perforation in the postero-inferior quadrant, an acutely inflamed Shrapnell's membrane, and a sodden appearance of the rest of the drum and of the canal, on which lay a considerable amount of bleached desquamated epithelium. The temperature had risen to 100° F. For the following two days there was a clear watery discharge, very slight in amount, with an occasional throbbing or full feeling in the ear on movement. On the seventh day there was some redness of the posterior of the drum; on the ninth the normal landmarks had reappeared and the postero-inferior quadrant was like dirty crumpled blotting-paper with pinkish streaks in the folds. On the twelfth day the drum and the hearing, which had been diminished, were normal.

Case V

A girl aged 5, admitted to hospital on September 27 with a moderately severe attack of scarlet fever, developed earache on the evening of October 15 with a temperature of 100.6° F., and was put on sulphanilamide. Her progress up till then had been normal. Her left drum was bulging with yellowish-white pus. Next morning the earache had gone. By the 18th the bulging had disappeared; the drum was becoming normal, and was patterned with the usual wavy dilated vessels. On the 21st lustre and tone were returning; the wavy vessels were then only very thin brown streaks. On the 25th both drum and hearing were normal.

Case VI

A girl aged 12 was admitted to hospital with scarlet fever on October 16. Her throat was very red, oedematous, and angry, and she complained of severe earache. She was given sulphanilamide. Her temperature ran between 99.6° and 98° F. for two days, and then fell to 97–98° F., while her pulse dropped from 100 to 76. The earache persisted in modified degree for two days. On examination a blackish-grey sac lay on the canal up against a redly inflamed membrane whose landmarks were obscured. By the 18th the sac had shrivelled and become lobulated, while two small blebs had appeared at the lower end of the handle. By the 21st the sac had completely gone and the blebs had been replaced by two red spots. There still remained some deafness and occasional discomfort in the affected ear. Hearing was normal on the 26th and the drum normal on the 28th.

Case VII

A girl aged 7 was admitted to hospital with scarlet fever on November 3. She had a very red raspberry-tongue, was powdering on the face and body, and had patchy exfoliation on the chest. She appeared to be seriously ill, and was very deaf. Her temperature remained 101° F. for two days, then gradually fell until it was 97.6° F. on the fifth day, while the pulse dropped from 132 to 96. Treatment with sulphanilamide was started on admission. The left drum showed slight otitis media, while the right was bulging with pus, and a bead of this yellow-green pus, obviously thick and tenacious, had just burst through a small perforation in the postero-inferior quadrant. On the 4th the earache had gone, while the bead of pus had dried or had become inspissated, assuming a conical shape. On the 7th the bulging was gone. The area was now a deep brownish colour, while the conical bead appeared to have become softer and to have sagged somewhat, probably owing to leakage of a minute quantity of serum. On the 11th deafness as tested by a 30-in. watch had risen from *nil* at contact to 12 in., the antero-inferior quadrant was normal except for some fine streaking, Shrapnell's membrane was still moderately inflamed, but the processus brevis had regained its normal white appearance. Progress thereafter was rather slow; hearing was normal by the 19th and the drum normal on the 21st—that is, eighteen days from the onset.

Discussion

From the case histories all seven appear to be cases of acute suppurative otitis media due to haemolytic streptococcal infection, especially Case I. It may be questioned whether all were in fact "suppurative" otitis, or whether some of them may not have been "catarrhal" in type. Clinically, it is usual to divide otitis into the catarrhal and suppurative forms, but the distinction is largely one of degree. Mollison (1936) says that "fever, earache at night, deafness, and a variable degree of bulging and injection of the drum with obscuration of the usual landmarks are signs each strongly suggestive of suppurative otitis, present or impending, whereas in simple catarrhal

otitis the symptoms and signs are usually ill defined." Past experience with similar ear lesions treated by paracentesis convinces me that the present cases were very definitely suppurative in type. The sudden onset, the earache at night with bulging in a few short hours, deafness and pyrexia in all of them, actual rupture of the drum in two cases, and in three the development of "snowflakes" or "puffs of cotton-wool" due in all probability to localized massing of pus cells, scattered over the inside of the drum, strengthen this conviction.

It has been generally agreed that with a bulging drum, be it due either to acute catarrhal or to acute suppurative inflammation, abortive measures are neither adequate nor safe. Watson-Williams (1933), Graham-Brown (1936), and Colledge (1937), in the more recent literature, suggest that "immediate" incision of the drum is necessary. If sulphanilamide therapy is capable of favourably influencing otitis (acute infection of the middle ear) at both the earlier and the later stages (Horan and French, 1938) the same good results should be possible in the intermediate stage—that is, in cases of suppurative otitis with bulging in which rupture has not taken place. It was decided, therefore, with some trepidation, and not without some anxious moments later, to try the effect of sulphanilamide without resort to surgical measures. All cases were treated as of the same age group for purposes of dosage. 7½ grains of sulphanilamide (1 tablet) was given, crushed or to be chewed, every four hours for the first two days, the number of tablets being reduced on alternate days by one till the patient was receiving two tablets only on each of the last two days. That was the minimum dosage, but where the local ear signs were not clearing satisfactorily reduction of the number of tablets was delayed. The average total per case was 225 grains over an average of seven days.

To be able day by day to observe clearly the progress made, through a canal unblocked by the usual discharge of pus, to note the gradual diminution of the bulge, to see the normal landmarks return and the inflammation disappear as resolution became complete and normal lustre and function were restored within a few days, was a novel experience. No less pleasing was the appreciation of the fact that by avoiding surgical measures these children were escaping not only the mental and physical trauma inseparable from anaesthesia and surgical operation but the further danger of superadded infection. Even in Case IV, in which rupture of a sero-sanguineous sac took place within a few hours of the onset, probably from greater virulence of infection, the discharge quickly became clear and very small in amount, so that after the first few hours there was no interference with visualization of the drum. Case VII was probably the most spectacular in that the infection was completely arrested at the actual stage of rupture. The likelihood of spontaneous remission may be dismissed as all the cases had a sudden onset, and even in a case of simple catarrhal otitis Mollison (1936) believes that with a sudden onset there is little chance of resolution. How much truer must it be with a drum bulging with pus! With such a small number of cases controls were out of the question, but I may be permitted to compare, or rather to contrast, other children treated in the same way during the same epidemic, seen at a later stage when rupture of the drum had taken place and a discharge had existed for at least twenty-four hours. In those the discharge remained purulent, the average time taken for complete recovery being twenty-three days, whereas in the present series the average was eleven days. Even with so small a number the results were so outstanding as to suggest that, if seen early and sulphanilamide therapy is immediately instituted, conservatism may be practised with safety in cases of bulging in which rupture has not taken place, with a dropping temperature, disappearance of pain, diminution of deafness, lessening of the bulging, and a reasonably steady pulse.

Summary

Seven cases of acute suppurative otitis media with bulging of the drum, occurring in children and successfully treated without paracentesis, are described.

The treatment adopted was the early use of sulphanilamide in adequate dosage. No local treatment was considered necessary.

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CYSTICERCOSIS EPILEPSY

BY

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The following case is of interest on account of the relative rarity of the condition and the unusual clinical features presented.

Case Report

A soldier aged 37 was admitted to the neuro-psychiatric wards of an emergency hospital on November 8, 1940, for observation on account of marked abnormalities of conduct. There was a history of his having wandered away from his post while on guard duty and being unable to give any satisfactory explanation of his conduct. The patient was of good physique and was the eldest of seven children, all of whom are alive and healthy. Childhood was normal and he had had *no illnesses*. He served his apprenticeship as an iron-moulder, and in 1923 joined the Army. In January, 1927, he was drafted abroad, and served in various districts of Northern India until December, 1933, when he was placed on the Army Reserve and returned to London. While in India he contracted sand-fly fever in 1929 and suffered from intestinal colic of unknown origin in 1931.

He remained healthy and in constant employment until October, 1934, when he awakened one morning with "cramp-like" pains in both arms and both legs, and was informed by his room-mate that he had been throwing his arms and legs about during the night. He attributed his symptoms to the effects of nightmare, and did not seek medical advice. In May, 1935, he was found lying on his bedroom floor one morning, and had no memory of what had happened. He sought medical advice, but does not seem to have received any treatment. In November, 1936, he had an attack of "mental confusion," which came on suddenly, but there is no history of loss of consciousness or of falling. He was treated at this time with 1 grain of luminal at night, but the diagnosis of epilepsy does not seem to have been established. He remained well, and was called up for service in September, 1939. In May, 1940, when in France, he felt a choking sensation while bending over his haversack, and then lost consciousness. On recovering, his arm muscles were painful, but his companions informed him that there had been no evidence of twitching and that his colour had remained pale. He returned from France in June and remained well until September, 1940; at this time, while on guard duty, he felt a choking sensation coming on, and left his post in order to sit down. He did not remember anything further until he wakened up in the guardroom and was informed that he had threatened an officer with violence. In view of his plea of loss of memory he was transferred to this hospital for observation and investigation.

On admission no abnormality was noted in his physical condition. Examination of the central nervous system was negative. His blood gave a negative reaction to Wassermann

and Kahn tests. The cerebrospinal fluid gave a negative Wassermann reaction, the Lange test was 0111000000, Fehling's test was negative, no increase in globulin was found, and there was one small lymphocyte per c.mm. In view of his history the possibility of epilepsy was considered, and it was decided to utilize pitressin after his water balance had been established as a diagnostic test. This was carried out on November 13, but beyond the onset of severe frontal headache and nausea no definite result was obtained. At this stage the possibility of cysticercosis infection was considered, and it was elicited that pork had been a fairly regular article of his diet while in India. On November 14 radiographic films of the skull, root of the neck, upper arms, forearms, thighs, and legs were taken as a routine measure. The standard of radiograph aimed at was that of ordinary exposure conditions for bone detail with a very slight under-exposure. Widespread evidence of cysticercosis infection was obtained. The degree of opacity in the various cysts was seen to be uniform, and indicated that the infection was probably of equal duration in all parts.

Discussion

As MacArthur has pointed out in his original article on the subject, the history itself—namely, in the absence of any evidence of a familial or personal epileptic taint, the onset of fits in an adult who is not suffering from neoplasm, syphilis, or the after-effects of head injury—may be suggestive. The history of residence in India increases the possibility of cysticercosis infection, although the absence of such a history does not necessarily rule out this possibility. In most cases the diagnosis is easily established if palpable cysts are present, since one of these may be excised under local anaesthesia and examined in detail. In the present case this was not possible, as the parasites had lodged deep in the muscles and so escaped detection by any other means than that of radiography. In the absence of palpable cysts no single series of examinations can be relied upon to exclude cysticercosis, and in doubtful cases it is advisable to keep suspected cases under observation, examining the body surfaces at regular intervals for the development of superficial cysts and performing regular radiographic examinations. Blood films are considered to be of little diagnostic value, since, although an eosinophilia may be present in the earlier stages when the embryos are active in the body, in the established condition the parasites have become walled off and exert little influence on the blood picture. The prognosis in this condition must be a matter of extreme difficulty, since during life there is no method of determining the number of cysticerci present in the body or of ascertaining their future behaviour, on which the prognosis depends.

Summary

A case of cysticercosis epilepsy presenting unusual clinical features is described.

Emphasis is laid on the importance of regarding every case of epilepsy occurring in a previously healthy adult who has lived for a period in the Tropics as a probable case of cysticercosis until it has been proved otherwise.

The value of radiographic investigation in this condition is demonstrated.

A negative radiograph of the skull is not considered to be of any significance, since well-marked calcification can be demonstrated in cysts of the soft tissues.

Calcification of the cysts is a relatively slow process, and the degenerative changes may be complete in the muscles at a time when the brain is unaffected.

The size of the cysts depends mainly on their age and situation. If in firm tissues, where they are subjected to equal pressure on all sides, they are small and rounded; while in the muscles, where the pressure is unequally distributed, they lie between the muscle fibres and are oval in shape.

Evidence is produced in support of the theory that the cysticerci while alive enjoy a relative tolerance on the part of the host, but that after death they act as foreign irritants and produce changes partly by their toxic effects and partly by increased pressure on the surrounding tissues.

My thanks are due to Lieut.-Colonel G. Petit and to Dr. A. M. Dryden for facilities in examining this case, and to Dr. J. Kemp Harper and Dr. J. Fergus Henderson for carrying out the radiological investigations.

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CASE OF VENTRICULAR FISTULA

BY

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The recording of a solitary case can scarcely be expected to add much to our knowledge of the local effects of the newer chemotherapeutic agents, yet the following case presents some unusual features, justifying a very brief summary that includes only the essentials.

Case Report

A man was admitted to an E.M.S. hospital on June 1, 1940, having sustained a gunshot wound of the head an indefinite number of days previously. On account of cerebral compression he was unable to give any history, but it is known that he was not picked up until three days after receiving the wound. On admission there was a jagged septic wound of entry in the left parietal region, with foul discharge. The patient was semi-comatose and lay coiled up on his side. He had photophobia, right homonymous hemianopia, and weakness of the right leg, with up-going toe. A penetrating wound of the forearm, with compound fracture of radius and median nerve injury, was also found. The temperature was 99°, the pulse 56, and the respirations 18. Radiographs showed foreign bodies in the brain and a comminuted fracture of the left parietal. He was treated with 1 gramme of sulphapyridine (M & B 693) four-hourly, magnesium sulphate enemas, and intravenous sucrose injections.

On June 4 the scalp wound was excised and the opening in the skull enlarged, care being taken not to disturb any dural adhesions. The brain was black and mushy and foul-smelling. The track was explored for two inches, and portions of bone, metal, and hair were removed, together with much pus and broken-down brain. The longitudinal sinus was found plugged with septic clot; this was removed and the sinus packed with flavine gauze. A flavine pack was applied over the whole wound. Culture from the wound gave a profuse growth of organisms of the *B. coli* type. Post-operatively a fungating hernia cerebri developed; the track was explored with sinus forceps on several occasions, but only a small quantity of pus was obtained.

June 10.—Definite improvement. He was fully conscious, the pulse was 72, the fields of vision had improved, and the hernia was not increasing.

June 28.—For the past few days he had been getting worse again; the hernia cerebri was increasing and cerebrospinal fluid was escaping in large quantities from the centre of the hernia: evidently there was a fistula through to the lateral ventricle. Further treatment with sulphapyridine and hypertonics was given.

July 5.—The temperature was now 103°, and there was stiffness of the neck and pain in the back; large quantities of cerebrospinal fluid were still escaping, becoming slightly purulent. By lumbar puncture a heavy purulent fluid was obtained, practically pure pus, with very high cellular content, 95% polymorphs; cultures showed coliform organisms corresponding to those previously found in the brain; chlorides 0.665%,

protein 0.520%, no sugar. It is to be noted that the fluid was not under pressure, probably owing to the rapidly leaking fistula. Sulphapyridine was continued by injection, but no improvement was seen.

July 16.—Operation: the scalp was freed from edges of wound and freshened. Too much of the dura was missing to permit of closure; the edges of the sinus were cleaned up and the whole wound and fistula were packed with sulphapyridine powder; the skin edges were carefully approximated and closed watertight. Lumbar punctures and hypertonic treatment were continued.

July 24.—Considerable improvement: the wound healed by first intention. The cerebrospinal fluid was still cloudy—cells 910 per c.mm., polymorphs 95%, many pus cells present, cultures sterile; chlorides 0.710%, protein 0.185%, trace of sugar.

From this point progress was uninterrupted, and six months later the only remaining neurological signs were a right lower quadrantic hemianopia and a pulsating closed hernia cerebri of comparatively small dimensions. In the interval the divided median nerve had been sutured in the forearm, and now showed early signs of recovery.

Commentary

The special points to be noted in this case are: (1) The care taken to avoid meningeal infection in the first operation. (2) Despite intensive hypertonic treatment, the open hernia cerebri dragged upon the lateral ventricle and so led, after a time, to the formation of a fistula. (3) The fistula inevitably led to infection of the ventricles and then to spread to the basal and spinal meninges; it also produced profound alterations in the hydrodynamics of the cerebrospinal fluid, which accounts for the unusual features, such as the replacement of the fluid by frank pus under no increase of tension. (4) The failure of general chemotherapeutic treatment to arrest the widespread meningitis under these special circumstances; nevertheless the wound healed per primam although bathed in purulent cerebrospinal fluid. (5) After closure of the fistula the fluid had to pass through the foramina in the roof of the fourth ventricle and so dilute the spinal fluid, probably carrying to it sulphapyridine obtained from the wound and possibly some also from the blood stream.

Clinical Memoranda

Abscess of the Medulla Oblongata Associated with Chronic Pulmonary Tuberculosis

The unusual clinical features of the following case make it interesting enough to be placed on record.

CASE REPORT

On the evening of December 11, 1940, a police constable aged 43 was admitted to St. Thomas's Hospital, having been ill at his home for ten days. His health had previously been good, apart from a single attack of haematuria, for which he had been treated in 1933; and he had been on duty until the onset of his illness.

His original complaint had been of severe headache and aching in the back and limbs; he had also noticed some unsteadiness of gait. After three days vomiting started, and became increasingly troublesome. Four days before admission obstinate hiccup developed: he then noticed numbness of the right side of his face and of his right arm for the first time. He described the headaches as being confined to the frontal region. The onset of vomiting he associated with eating fish which he thought was not fresh. After vomiting had persisted for three days he found that it was getting increasingly difficult to swallow, and this difficulty was particularly noticeable when taking fluids. His appetite was good and he felt that he wanted to eat. He had had a chronic cough for some years, but during the last four days he had remarked that the cough had suddenly stopped. His bowels had been constipated since his illness and he had passed only small quantities of concentrated urine.

On examination he was markedly cyanosed and wasted; his temperature was 101.6°, pulse 52, and respirations 28. There was a fine nystagmus on looking both to the right and to the left. The disks were difficult to see, but appeared blurred at the edges. The tongue on protrusion deviated to the left. The speech was slurring. There was diminished sensation to pin-prick on the right side of the face and on the right arm. No other abnormality was found in the central nervous system. Examination of the chest showed poor air entry on both sides, more especially at the lung bases. He regurgitated fluids when given drink. When at rest he did not appear unduly distressed, but he became very dyspnoeic on slight exertion. His blood urea was 26 mg. per 100 c.cm., and the blood Wassermann reaction was negative. The cerebrospinal fluid showed: 12 cells per c.mm.; total protein 0.055%; a faint trace of globulin; and a negative Wassermann reaction. The fluid was not obviously under pressure.

A radiograph of the chest showed evidence of apical tuberculosis, more pronounced on the right side than on the left. The right base was emphysematous and the lower two-thirds of the left lung showed evidence of early bronchopneumonia. The patient was very dehydrated, and 5% glucose in saline was given by means of a slow intravenous drip; but he became distressed, so rectal glucose salines were substituted. His condition deteriorated rapidly, and the following day his speech was unintelligible. He showed signs of increasing pulmonary oedema and died during the afternoon.

A post-mortem examination was performed by Dr. J. A. R. Miles, who reported as follows:

> "Lungs.—A small spontaneous pneumothorax on the right side. Both lungs show apical tuberculosis, the right showing a number of small cavities. There was gross oedema of the bases of both lungs.
>
> Brain.—A small abscess about 0.5 cm. in diameter, situated centrally in the upper part of the medulla oblongata. There were no other significant abnormalities."

Death was due to the development of a septic abscess of the medulla oblongata following upon a chronic tuberculous infection of the lungs, which had become secondarily infected.

A film of the pus showed large numbers of Gram-positive cocci; tubercle bacilli were not found. Culture from the abscess was not done, as it was thought that it would give no further information of value, the infection being an impure one.

I am indebted to Sir Maurice Cassidy for his permission to give an account of this case.

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Perforated Oiled Silk in the Treatment of Burns

I am prompted to write this short note after reading the leading article in the *Journal* of November 16, 1940 (p. 672), and the report of the Royal Society of Medicine in the same issue (p. 679) on the treatment of war burns.

The present-day treatment of burns by tannic acid and gentian-violet, although giving excellent results as a rule, is not always satisfactory, particularly when sepsis occurs. The treatment of these septic areas is a problem, and in spite of all the various types of applications of lotions, oils, and even skin grafting, they often refuse to heal. The failure of epithelization is in my opinion due to too frequent dressings, which not only prevent healing and subject the patient to a daily torture, but even when carried out under an anaesthetic reduce him or her to a nervous wreck.

METHOD OF USE

Any treatment which produces this state of affairs is obviously wrong, and through the kindness of my colleagues

at the Liverpool Royal Infirmary I have had the opportunity of trying out the value of a partially occlusive dressing in the form of perforated oiled silk. It is applied as follows:

1. A simple zinc paste or ointment—e.g., ol. morrhuae et ung. zinci (*B.P.*) āā—is spread for a breadth of about half an inch on the surrounding sound skin reaching up to the edge of the burnt area.

2. A sheet of oiled silk, perforated with holes one-eighth of an inch in diameter and half an inch apart, is then cut to the size and shape of the burnt area, but with an overlap of half an inch to lie on the ointment margin. It is sterilized, preferably by boiling, and is spread out and placed direct on to the raw surface.

3. Dry gauze or a saline compress is put on the top of the oiled silk and the part is lightly bandaged.

4. This dressing should be left quite undisturbed, and changed entirely, twice a week only, when the margins of the burn are cleaned and the oiled silk is resterilized and replaced.

5. The gauze may be changed daily, but it is important that the raw area should be left untouched during the re-dressing.

6. As the part heals in from the edges the oiled silk should be trimmed to fit.

RESULTS

The improvement in the appearance of the wound (although, of course, this will vary according to its age) and in the general well-being of the patient is most pronounced in a few days. Gone are the terrors and horrors of the daily dressing, and, instead, cheerfulness and sound sleep return.

The rationale of the treatment is the protection given to the growing epithelium and the opportunity provided for it to proliferate, as it should, in its own serous discharge, without interference and without antiseptics. In the presence of the efficient drainage provided, the bactericidal action of the secretion from the wound is adequate to cope with any superficial infection, and there is consequently no septic absorption. Islets of epithelium rapidly appear, and capillaries develop so quickly in the healthy granulation tissue that their delicate walls are ruptured by the slightest injury or even, as in one case, under the influence of gravity. This patient had to be kept lying prone, as she was burned on the back of the thighs, and change of posture caused free bleeding in a few hours.

The healed skin resulting from this treatment, while not entirely devoid of thickened scar tissue, compares very favourably with the results of other mthods. The total number of cases treated is not large, but the burns have been extensive—in one case the areas measured 11 by 5 inches on the back of each thigh.

This method has also been tried in the primary dressing of a number of cases of small burns, with results which compare very favourably with those of other methods, and my experience leads me to suggest that further use might be made of it. It is not a new treatment for burns, and it is possible that perforated cellophane or some other non-adhesive material might be substituted for the oiled silk.

Liverpool, 1. R. STOPFORD-TAYLOR, F.R.C.S.Ed.

The February issue of *Industrial Welfare and Personnel Management*, the journal of the Industrial Welfare Society (14, Hobart Place, S.W.1), contains an article on hours of work which enforces the point that by undermining health long hours of work lower both quality and quantity of output. Striking evidence of the futility of overtime is shown in figures from an engineering firm: In January–June, 1940, 26,200 more overtime hours worked than in previous year; but also 23,800 more hours of absence; net addition only 2,400 working hours. Three-shift systems are generally recognized as making the best use of men and machines, "as machines can be used quite continuously, while workers are on duty for only eight hours a day and forty to fifty hours a week." It is not always possible, however, to obtain the necessary labour, and various alternative arrangements of hours are described in some detail.

Reviews

FRACTURES

Fractures. By George Perkins. M.Ch., F.R.C.S., Assistant Orthopaedic Surgeon to St. Thomas's Hospital. (Pp. 384; illustrated. 20s. net.) London: Oxford University Press. 1940.

There are certain well-known medical synopses which have long been popular, though chiefly for examination purposes. This book on fractures is a cross between a synopsis and an ordinary textbook. There is no preface, no introduction or references, and one finds throughout a dogmatism and an apparent objectivity that would lead the innocent reader to suppose that in the treatment of fractures the last word has been spoken. Actually the teaching is Mr. Perkins's own, and is in fact no more impersonal than the collections of lectures which from time to time have been brought together and published by other distinguished teachers in medicine and surgery. It is therefore a little unfortunate that in dealing with a subject in which man-made methods of treatment vary so much, each in the hands of its advocates yielding fairly good results, so able a teacher as Mr. Perkins should adopt a pontifical style. It also makes it easier for critics to find holes in his work, particularly where he is dealing with topics that are not usually regarded as within the province of the orthopaedic surgeon. For example, fractures of the skull are described in a manner so sketchy as to be quite useless; nor is it quite so easy as he suggests to reduce fractures of the nasal bones. His description of the treatment of open fracture is inadequate; the last few months have taught us that in compound fractures shock cannot always be disregarded, and we have come to be much more precise in the technique of excision of an infected wound. Yet the only thing that Mr. Perkins has to say about the skin incision is that one should not enlarge the wound more than is necessary: poor counsel for a worried resident surgical officer who wants to know how big the incision should be—*in other words, what is necessary.*

But having drawn attention first to these blemishes we can more easily commend all that remains. There are about this book, particularly in the introductory chapters, a clarity and precision that compensate for the somewhat jerky style. If a small allowance is made for the fact that the author is an advocate of under-treatment rather than over-treatment, of less rather than more splinting, it is fair to say that the man who follows his instructions will not often go wrong. The value of active movements from the earliest possible moment, and the dependence of functional recovery on the patient's interest in and use of the damaged part, could not be more clearly stated. It is possible that some will be a little nervous about the light-hearted way in which fractures of the lower end of the fibula, stellate fractures of the patella, and fractures of the shaft of the humerus are left to recover by natural means. Yet if the standard of simplicity and absence of meddlesome intervention so characteristic of this book were to be seen in the fracture departments of our hospitals much suffering and disability would be avoided.

Something must be said about the arrangement of the pages. The illustrations are all diagrammatic, and though many of them are crude they are on the whole effective. But when the author has finished with one subject the letterpress stops even if it has covered only a quarter of a page. What is meant to fill these gaping voids: the

reader's notes? If they are not intended for any such purpose, then one can only conclude that there is more paper in the country than we thought.

PHYSICS OF THE ATOM

The World and the Atom. By C. Møller and Ebbe Rasmussen. Foreword by Prof. Niels Bohr. (Pp. 199. 10s. 6d. net.) London: George Allen and Unwin, Ltd.

There can be no doubt that to the scientist of the future the first half of this century will be marked down as the period in which the subject of atomic physics was born. Fifty years ago the suggestion that an atom had a complex structure would have been regarded with suspicion, while to-day we not only know an immense amount about that structure but we know many of its details with astonishing accuracy. We actually know the diameters and periods of the electron orbits with greater accuracy than we know the dimensions and orbits of the planets of our solar system, and from movement of these electrons we are able to unravel with absolute precision the vast complexity of the lines of the spectrum. Moreover, there is scarcely any scientific investigation of the present day which does not make use of atomic physics; it is the basis of wireless reception, it is fundamental in the development of *x* rays, and it is the whole secret of radium. Yet its comprehension involves physical concepts of the greatest difficulty, which can really only be fully explained by the most advanced and intricate mathematics.

The World and the Atom is an attempt, and a very successful attempt, to explain in non-mathematical language the essential physics of the atom as it has been revealed by the work of physicists of the last forty years. Beginning with a general statement of atomic structure, it enters at once upon a historical account of the work of Becquerel and Rutherford on radium, and shows how this gave the first insight into the structure of the atom, and it explains how this structure accounts for the production of spectra and of *x* rays. The next chapter deals in greater detail with the minute structure of the atom and describes how this has been investigated and how the whole of the elements have been classified and indexed. The remainder of the volume deals with the extremely difficult problem of the structure of the atomic nuclei and the revolutionary methods by which this has been investigated, and with some of the implications in cosmic physics that are involved.

The whole book forms the clearest possible account of atomic structure, and it deserves careful study by all those who are to make use of modern physical methods. Even those who are fortunate enough to possess a good mathematical equipment will find it well worth while to look at those subjects from a more popular aspect and to realize that the problems they have been accustomed to express in mathematical formulae can, at least in outline, be described in simple terms.

INTERRELATION OF ABDOMINAL DISEASES

Inter-relation of Abdominal Diseases. By Elemér Forrai, M.D.Budapest, L.R.C.P. With a foreword by Sir Arthur Hurst, D.M., F.R.C.P. (Pp. 168. 12s. 6d. net.) London: William Heinemann (Medical Books) Ltd. 1941.

The study of structure, whether normal or pathological, has always had to precede that of function. In the case of the alimentary tract this led in the past to an artificial separation in our conception of its various diseases. Of recent years that attitude has to some extent been modified by three factors: the recognition of the frequency with which dyspepsias are based on organic lesions on the right side of the abdomen; the importance attributed to viscero-motor reflexes; and the study of allergy. The stage was therefore well set for the appearance of Dr. Elemér Forrai's book on the interrelation of abdominal diseases. Starting with cholecystitis, he points out that dysfunction of the gall-bladder or biliary stasis may be due to inhibitory reflexes from chronically diseased portions of the digestive tract. The bacteriology of cholecystitis indicates, though the ways of infection are different, involvement of several abdominal organs and the unity of origin of their inflammatory changes. He then goes on to discuss appendicitis, calling attention to the way in which it may excite spasmodic hour-glass contraction of the stomach, and to the importance of achlorhydria in permitting infection of the alimentary tract lower down. We can understand that removal of the appendix alone is of little value if it is only one part of the pathologically changed intestine. Dr. Forrai adopts Craven Moore's conception of reflex dyspepsia from a lesion more or less remote from the stomach itself. The gastric symptoms which occur in connexion with such lesions may be due partly to visceral reflexes, but in the end gastritis will develop. He prefers to speak, therefore, of gastro-appendiculo-cholecystitis, and in support of his thesis that it is a hereditary familial disease gives a number of interesting family trees. The connexion between the liver and this combined disease is worked out in an interesting manner, in which stress is laid on the detoxicating influence of the liver, and the author maintains that all allergic manifestations are accompanied by hepatic insufficiency which diminishes its detoxicating power. Due importance is given to emotional factors in upsetting visceromotor reflexes which allow of disturbed secretions and unchecked infections. An interesting point, in view of recent work on hepatic damage in the severe forms of thyrotoxicosis, is the effect claimed for a damaged thyroid as a contribution to the allergic state.

Though marred by some tiresome reiterations and the not infrequent misspelling of the names of the authorities quoted, this is a thought-compelling book well worthy of attention. Sir Arthur Hurst, to whose teaching the author is evidently much beholden, contributes an appropriate and commendatory foreword.

MIND AS A DISCRETE ORGAN

The Human Mind: The Organ of Thought in Function and Dysfunction. By Murdo Mackenzie, M.D., M.R.C.P. (Pp. 215. 7s. 6d. net.) London: J. and A. Churchill. 1940.

This small volume sets out a somewhat new approach to the problems of psychotherapy. Dr. Mackenzie looks on the mind of man as a discrete organ with a specific function, working in rhythm in space and time and driven by strictly mental forces. This notion, he suggests, is new and is elaborated for the first time in this book. To claim novelty for any opinion about the mind is somewhat bold. Something very like this approach has marked more than one ancient philosophy, but it has certainly not previously occurred to the psychology of the present age, with its unbalanced and incomplete "scientific" outlook. When the function of the mind is disturbed it is, according to Dr. Mackenzie's experience, accelerated in anxiety, retarded in apathy, or isolated from external contact in defence. In all these states, he says, it can be accurately observed. During and after readjustment the organ can be studied in the process of passing from faulty to full function, and the passage reveals that the same driving forces are present throughout. These are specific to the organ and their nature is strictly mental. Maladjustment of these forces is the common cause of nervousness and the resultant and widespread human suffering; readjustment restores hope, efficiency, and confidence. The future

of psychological medicine should, he considers, lie in the direct investigation and accurate description of the laws governing the mental organ.

Dr. Mackenzie has been a consistent champion of what Jung has called the "introvert"—the person who, from his relatively deliberate mental movement and narrow focus on life, has tended to be denied sufficient scope and the credit he deserves in a highly specialized and distracted world. The author is here chiefly concerned with the therapy of the depression which overtakes the "deliberate-simplifying" type of mind when it is thwarted by overmuch subjection to the current "immediate-amplificatory" methods of thought. There is nothing strikingly novel either in his clinical description of the problems of this kind of patient or in the lines of treatment he advocates, but his essay is likely to throw valuable fresh light for clinical psychologists upon syndromes which, when approached in certain ways that are now current, remain unintelligible and intractable. His stressing of the conflict of the opposites as a normal state of the healthy human mind is valuable; neglect of this fundamental fact is responsible for a good deal of the ineffectiveness of modern psychotherapy. He also includes some interesting deductions about the war and its psychological background. He has made a distinct individual contribution to practical psychology, and one which its practitioners would do well not to ignore.

Notes on Books

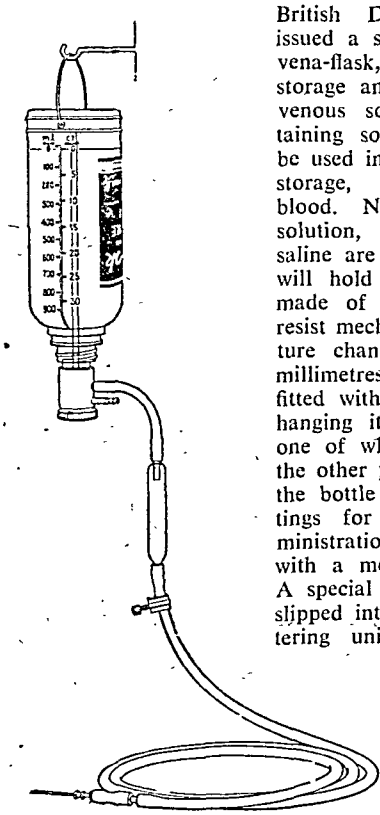
A little slip of a book, *The New M.O.*, was recently sent to the writer of this note for comments. It is a small pamphlet of twenty pages, written for medical officers attached to A.A. units by Colonel C. A. WEBSTER, T.D. The value of the little book varies inversely as its size; it is crammed full of sound, practical advice; it is worthy of study and application by all Army M.O.s. "The M.O. who is imbued with the idea he is to be 100% doctor will not be a *persona grata* with his C.O." "Your liaison with the regiment must be a happy contribution of social and business contact." Helpful detailed hints on the thousand and one duties of the M.O. are clearly and concisely given. Prevention of illness and preservation of health are ideals which it is possible to carry out in the Army, and which one day will also be practicable in civil life. Colonel Webster is to be congratulated on his effort. The book is printed for circulation in his Division only. It should be made available for all medical officers.

JULIUS SIGURJONSSON'S little book, *Studies on the Human Thyroid in Iceland*, is one which may be read with interest by all students of the thyroid gland. In it are presented the results of a study of the size, weight, iodine content, and structure of the gland in the general population of Iceland. His own data are compared with statistics from other regions and their significance is well discussed. It is shown that the weight of the thyroid is unusually low in Iceland, as it is also in Japan, Bergen, and Aberdeen. In an interesting chapter on hyperplasia the author produces evidence to support his view that the usual stimulus to thyroid hyperplasia is rather a low total iodine content of the gland than a low iodine concentration per gramme, as has been suggested by Marine. Neither in this chapter nor in a subsequent one on nodule formation is any mention made of hyperthyroidism in Iceland. It would have been interesting to see comparative figures of its frequency here and elsewhere. The book is priced at 6s. and is obtainable from H. K. Lewis and Co.

Those who had the pleasure of hearing Dr. RUSSELL L. HADEN lecture in England a few years ago will not be surprised that his *Principles of Hematology* shows the same free use of diagrammatic representation (second edition, Henry Kimpton, 21s.). The student who uses this book will learn a great deal about the manufacture and function of the blood cells and will be equipped with a useful discipline for facing clinical problems. He will learn very little about the natural history and morbid anatomy of diseases of the blood. The physiological approach to clinical medicine is indeed beset with great difficulties, if only because of the narrow limits of our knowledge. The student might well begin with Russell Haden's book, but he should proceed to Janet Vaughan's *Anaemias*, Claude Forkner's *Leukaemia*, and the Rose Research on Lymphadenoma if he really wishes to learn the principles of haematology.

Preparations and Appliances

THE VENA-FLASK



British Drug Houses has lately issued a special type of flask, "the vena-flask," fitted for both the storage and administration of intravenous solutions. The flask containing sodium citrate solution can be used in addition for the removal, storage, and administration of blood. Normal saline, 5% dextrose solution, dextrose saline, and gum saline are also available. The flask will hold one litre of fluid; it is made of glass specially treated to resist mechanical shock and temperature changes, and is graduated in millimetres and fluid ounces. It is fitted with a rustless metal ring for hanging it up and with two caps, one of which acts as a seal, while the other protects the whole neck of the bottle from contamination. Fittings for the collection and administration of fluid are provided with a metal screw-cap adjustment. A special metal gauze filter can be slipped into position on an administering unit when blood is being given. The principle of the apparatus is similar to that of the Medical Research Council transfusion outfit, though more elaborate in detail.

VARIOSTAB

Variostab (Boots Pure Drug Co. Ltd.) is a preparation of ethanolamine oleate for the treatment of varicose veins. Ethanolamine oleate was reported on by Meyer (*Amer. J. Surg.*, 1939, **40**, 628), who found that it was as effective as sodium morrhuate and was superior to the latter preparation in that it did not provoke occasional allergic responses. Rogers (*British Medical Journal*, 1939, **2**, 383) considered ethanolamine oleate to be the most satisfactory of the sclerosing agents.

ALLANTOIN

It is becoming increasingly difficult to obtain synthetic compounds that are in any way out of the usual, and hence we welcome the announcement by Genatosan Ltd. that they are undertaking the production of a variety of fine chemicals. Among these allantoin is of particular interest. Two independent and somewhat unusual lines of research—namely, the study of the reputed healing action of comfrey root and the maggot therapy of wounds—both led to the conclusion that allantoin was the active agent, and that it caused leucocytosis and acceleration of wound healing. The latter is an action that is difficult to measure accurately, but the evidence available suggests that allantoin has a beneficial effect on the healing of septic wounds and ulcers.

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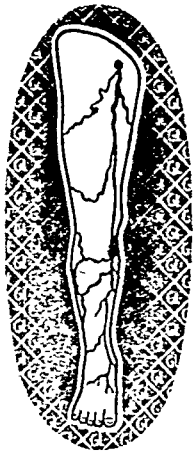
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An aqueous solution of ethanolamine oleate (5%) with 2% benzyl alcohol. Ampoules, 6 x 2 cc. Bottles of 15 cc. and 30 cc.

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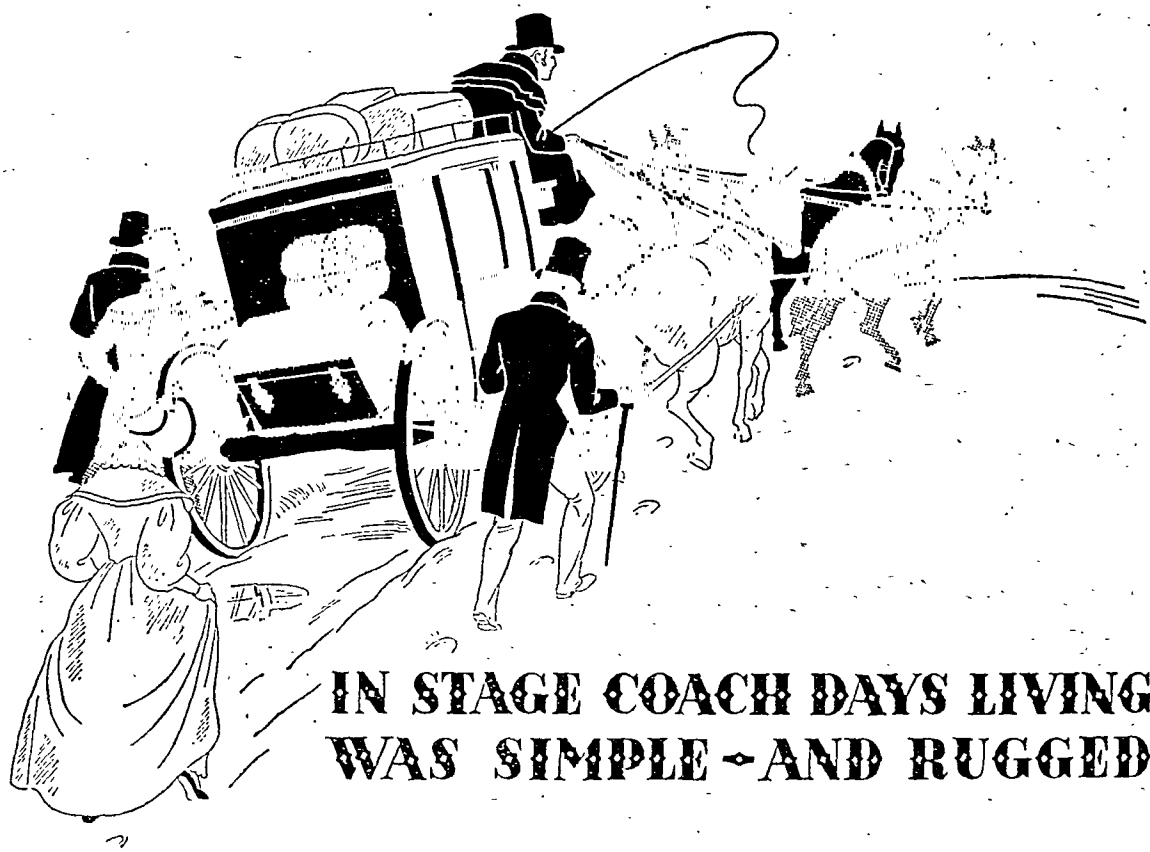
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BRITISH MEDICAL JOURNAL
LONDON
SATURDAY MARCH 15 1941

FIRST AID FOR FIRST AID

One of the virtues of war is that it compels us to review old ideas and customs in a new light, especially when they relate to activities that have an urgent bearing on the war situation. One example of this is the renewed interest in and research on air-borne and droplet infections. Another is first-aid treatment of the wounded and sick, which, with the bombardment of our cities, is now a problem of the first importance. As our correspondence columns have shown, medical men are beginning to question the adequacy of long-established training methods in first-aid technique. Perhaps the main burden of the criticism has been that in peacetime first-aid instruction and manuals were directed too exclusively to the examiner rather than to the examinee. That is to say, the passing of an examination was something that loomed large in the minds of both teacher and taught, and not enough stress was laid upon the limitation of what a first-aider could do and how he should do it. Excellent as the teaching was, and however enthusiastic and intelligent was the first-aider, the victim of an accident ran the risk of delay in receiving expert medical treatment because of the desire of the first-aider to carry out to the last letter the elaborate details of bandaging and splinting which had been drilled into him. By the time the victim arrived at a hospital or doctor's surgery it was too often found that there was much to undo before proper and urgent treatment could be applied.

In making these criticisms we would not be thought to underestimate the magnificent work that has been done by the British Red Cross and the St. John Ambulance. For their admirable and self-denying work no praise can be too high. But it was probably with such criticisms in mind that the Birmingham Joint Committee of the British Red Cross Society and the St. John Ambulance Brigade decided "to investigate and report upon the present methods of training first-aid workers," and for this purpose set up a special first-aid subcommittee, having among its personnel not only medical officers of the two organizations but several of Birmingham's leading surgeons, including university professors. The subcommittee came to the conclusion that the standard of training of first-aid party leaders is low and that there is no proper training system for lay instructors; that the rank and file of the first-aid services have been taught too much unnecessary and even harmful detail; and that the seriously injured man should be handled by the first-aid worker as little as possible and be transported to hospital within the minimum period of time. What is needed is that the first-aid worker should be taught a lot about a little, rather than a little about a lot, and that he should firmly grasp the fundamental principles of dealing with cases of shock, haemorrhage, and asphyxia, and worry himself less about the elaborate bandaging that so handsomely illustrates the first-aid manuals. The Birmingham Joint Committee, recognizing that the basis of intelligent and skilful treatment is sound training, and that inefficiency is often the result of bad teaching, has boldly recommended the institution of a civilian first-aid training school; but for the time being the scheme has unfortunately been turned down by headquarters in London. The idea is not to disappear, however, because the new Birmingham Accident Hospital, urged on no doubt by the committee's report, has decided to undertake the training of first-aid workers for industry, and, as will have been seen in our advertisement columns, one of the duties of the new clinical director will be to supervise first-aid training, a step so far without precedent in hospital policy.

It is proposed that the civilian first-aid training school—when it comes into being—shall be staffed by a whole-time commandant and four permanent instructors, and that lecturers and examiners should be chosen from a gradually widening panel of medical men and women. The committee has also had the wisdom to see that the instructor is in as much need of instruction as those who are to be taught. The teacher, in fact, has to be taught how to teach, and this will be an important function of the school. It is intended that students taking the course, which will last two weeks, should live in the school, and that in addition to this there shall be a part-time course of a minimum of eighty hours' duration for those who are unable to give their whole time to the work. There will be special courses for industry and special courses for nurses, and medical students will be offered facilities for seeing the work of the school, as they will be the future first-aid teachers. Criticism is levelled against the ease with which first-aid workers have hitherto acquired certificates of proficiency in first aid, and the committtee recognizes that a higher standard of proficiency should be demanded. Not only that, but the first-aid worker is not to be allowed to rest on his laurels and is to be re-examined every two years to see that he is still up to date in his knowledge and efficient in his practice.

While, no doubt, war conditions have fostered the ideas of reform now contemplated by the Birmingham committee, it is but a continuation of ideas which were in being before war broke out. In July, 1939, the British Medical Association issued a report on first aid in industry which put forward a number of important recommendations. The Birmingham committee, as would be expected, has a special interest in the need for adequate first-aid treatment of industrial workers; and that this interest should be shared by the country as a whole is demonstrated by the fact that during 1937 it was estimated that the total charge on industry in respect of industrial injuries was something like £13,000,000.

Here, then, is the beginning of a movement which we hope will be fostered and eventually taken up by

other big cities in the country. If prosecuted with the care and forethought given to it by the initiators it will go a long way towards minimizing and preventing the pain and disability arising from accidents of whatever kind, whether they occur in air raids, on the streets, or in factories.

BRITISH MOSQUITOES AND THEIR CONTROL

Up to recent years, when the importance of mosquitoes in tropical disease has led to a greater diffusion of knowledge about these insects than formerly, most people were under the impression that while there might be "gnats" there were no "mosquitoes" in this country. When, therefore, instances of "mosquito nuisance" were reported they were usually traced in the lay press to accidental introduction of these insects from abroad. In fact, not only are there many species of true British mosquitoes, but the individuals of these species are often sufficiently numerous and active in their blood-sucking propensities to become a nuisance or even a sanitary problem. Thus at certain seasons it may be impossible in the woodlands to rest or enjoy the scenery on account of the pertinacious and blood-thirsty attacks of some day-feeding species, reminiscent of the ubiquitous shade-loving *Stegomyia*, or, as it is now called, *Aëdes aegypti*, of the Tropics. Night-biting species, again, by their interference with sleep and irritating bites, in seaside places especially, are a serious problem to hotel keepers and others whose custom may thereby be affected. To the annoyance of the biting may be added the tendency of the bites to become septic with sometimes serious consequences. In addition the malaria-carrying *Anopheles* are in many parts of the country quite numerous, and even transmission of malaria in times like the present may be brought about where the necessary infection is provided by soldiers and others returning home from abroad. In a few restricted areas entirely indigenous cases of malaria have long been known to occur—a present-day aftermath of the once widely disseminated "ague." Such cases are fortunately very mild, are usually considered by the victims to be colds or chills, but are shown by blood examination to be of true malaria.

Altogether, therefore, it is a matter of some importance that reported instances of "mosquito nuisance," and especially any reported cases of locally arising malaria, have for many years been closely investigated by the Ministry of Health. The results of the large amount of practical information so gained have lately been summarized in an official memorandum under the authorship of Colonel J. A. Sinton, Adviser on Malaria to the Ministry of Health, and Mr. P. G. Shute, Assistant Malaria Officer.[1] After a brief review of the subject of malaria transmission and mosquito nuisance in this country the memorandum gives a complete list of the mosquitoes so far recorded from the British Isles, together with a brief but sufficient description of their habits, breeding places, and methods of control. Twenty-nine species are recorded—four anopheline and twenty-five culicine species—of which latter, however, eight are so rare or so seldom bite man that they may be considered unimportant as causes of public health problems in this country. Of the remaining culicines two belong to the genus *Culex*, eleven to *Aëdes*, three to *Theobaldia*, and one to *Taeniorrhynchus*, the last-named being noted as the most extraordinary of the British mosquitoes, as its larvae and pupae live entirely under water attached to the roots of aquatic vegetation, and so, unlike the larvae and pupae of other species, which must come to the surface to breathe, are very difficult to detect.

The two species *Culex pipiens* and *C. molestus*, which closely resemble each other in appearance, have only recently been recognized as distinct species—an important point, as it is extremely doubtful now whether the former species ever attacks man. The latter is probably the only mosquito which is troublesome in the centre of large towns. It is a most persistent biter, and where it is present in large numbers its bites probably cause a greater indoor nuisance to man than any of the other species of British mosquito. It bites only indoors; the mosquitoes biting in gardens and other places in the open are usually *Theobaldia* or *Aëdes* where they are not *Anopheles*. *Theobaldia* are very large mosquitoes, attacking boldly and giving a very troublesome bite. They are noticeable in many country places, but are especially responsible for mosquito nuisance in urban areas, breeding in water-butts, tins, and almost any collection of water. Their bite is more irritating and results in more swelling than that of any other British species. Most species of *Aëdes* breed in woodland pools. Some, however, breed in open ponds on heaths and commons, or in ditches; one is known to breed only in brackish water near the sea, though it may fly as far as five miles inland, thus recalling the "salt marsh" mosquitoes of some parts of America. This brackish-water species, *Aëdes detritus*, is noted as having been responsible for a greater number of cases of serious nuisance than any other of the British species.

The methods of control, as may be gathered from what has been said, depend very much on the species responsible. On this account much labour and material may be uselessly expended if due attention is not given to identification of the species and knowledge of its habits. Usually it is desirable in serious cases to obtain expert advice, and in a footnote to the memorandum it is said that, if application be made to the Ministry of Health, the local authority can usually obtain the assistance of an expert, who will make a mosquito survey and give free advice on the steps to be taken. The memorandum itself, however, under the heading of "Control" and in notes upon the different species, provides much useful information, including measures that can be taken against the adult mosquitoes as well as those against the larvae, and suitable repellents which can be rubbed on exposed parts of the body such as ankles, wrists, back of neck, and ears, to protect the individual against bites. Altogether this publication represents a most important summary of the whole situation, and should serve as a work of reference to all interested in British mosquitoes, whether from the point of view of natural history, of the public health, or of individuals who may experience mosquito nuisance in this country.

[1] *Measures for the Control of Mosquito Nuisances in Great Britain*, by Lieut.-Colonel J. A. Sinton and P. G. Shute. (Memo. 238, Med. H.M. Stationery Office. 6d.)

CLINICAL TRAINING FOR BRITISH STUDENTS IN AMERICA

In our Parliamentary Notes this week will be found the report of a statement by the Minister of Health in reply to Prof. A. V. Hill on facilities offered by the Rockefeller Foundation for British medical students to pursue clinical studies in medical schools in the United States and Canada. The Minister expressed warm appreciation of this sign of practical sympathy on the part of the Foundation and of the medical schools in America, and undertook to do all he could to further the scheme, which should strengthen the beneficial co-operation in medicine and public health between Britain and the United States and Canada. This welcome offer had its origin in a desire to help medical education in this country during a very difficult time, but it holds out wider possibilities for future and happier days. A strong committee has been formed (with Prof. J. S. B. Stopford of Manchester as chairman and Prof. H. R. Dean of Cambridge as vice-chairman) to select twenty-five to thirty students from among those nominated by the medical schools in Great Britain and Northern Ireland. By this means some of our most promising students will see, and take part in, the inner life and work of the best American schools and hospitals. We understand that the Rockefeller Foundation generously offers free tuition and maintenance on the other side of the Atlantic for a period of one year, which may be extended to two years. No one will be sent to take up a Rockefeller studentship without the approval of his own medical school, and provision will doubtless be made to ensure that a student does not lose ground by reason of his absence. Moreover, as the Minister of Health made plain in reply to a supplementary question by Sir Francis Fremantle, no student chosen for the purpose of continuing his clinical course in America should feel reluctant to leave this country during the war: he can, indeed, be encouraged to regard it as a duty to be undertaken in the national interest and in the cause of medical education. Not more than two of the British students will go to any one institution in the U.S.A. or Canada, and their allocation will be made by the British Committee, whose membership, in addition to Prof. Stopford and Prof. Dean, is as follows: Prof. Hugh Cairns, Mr. H. L. Eason, President of the General Medical Council, Prof. George Gask, Mr. G. F. Gibberd, Dr. A. M. H. Gray, Prof. A. V. Hill, Prof. J. W. McNee, Sir Walter Moberly, and Sir Franklin Sibly, with Mr. W. B. Brander, of the Universities Bureau of the British Empire, as secretary (c/o University College, Gower Street, London, W.C.1).

HOSPITAL WAR SUPPLIES

Hospitals which have been bombed, or find their stocks of clothing, comforts, ward and surgery supplies depleted by the needs of air-raid victims, are now getting much help through the British Red Cross, which is drawing for their benefit upon gifts from friends and workers in this country, the Dominions, and the United States. A small committee of hospital experts, aided by Thomas Cook and Son, has worked out a scheme for bulk distribution of these gifts to "key" hospitals, and these, in turn, are distributing to their sector hospitals. Thousands of cases are now being issued in bulk, or broken up and repacked in necessary quantities. They contain everything a hospital can require for use, from "helpless" shirts to surgical instruments for general and special use. Three thousand complete "bed sets" are coming to hand from the United States. Each consists of three blankets, twelve sheets, eighteen pillow-cases, with appropriate towels, buckets, pitchers, tumblers, even tooth-brushes. Water and instrument sterilizers, bandages and dressings, are also arriving. Bulk reception and distribution to "key" hospitals having been arranged, it now remains for local hospitals to make their applications to their key hospitals, and assist the latter in the sorting and distribution of supplies throughout their sectors.

SULPHATHIAZOLE AND SULPHADIAZINE

It is now becoming possible to assess the value of sulphathiazole in relation to other sulphonamide compounds. An outstanding original claim for this drug was its superior action on staphylococcal infections, and although this has not been altogether borne out by experience with the graver type of case complicated by pyaemia, it is fully supported in the studies of H. F. Helmholz[1] on the susceptibility to sulphathiazole of different bacteria in urine. The drug has also had fairly extensive trials in the treatment of pneumonia, and the experience of I. F. Volini, R. O. Levitt, and H. B. O'Neil[2] is representative. They treated 169 cases of pneumococcal pneumonia with sulphathiazole, and 164 patients, sixty-nine of whom were also given serum, with sulphapyridine: in these two large groups the type distribution, frequency of bacteriaemia, and proportion of patients over 40 years of age were closely similar. The mortalities in the two groups were 5.3% and 4.2% respectively, or a difference of only two deaths. There is in fact nothing to choose between the two drugs in ultimate curative effect. Sulphathiazole brings the temperature down somewhat more slowly, and is said to have a better effect than sulphapyridine in infections by Type II and VII pneumococci, whereas sulphapyridine gives better results in Types I and III. The only important difference in effect between the two drugs is that sulphathiazole is much less apt to produce nausea and vomiting, and patients taking it are therefore much more comfortable. Only seven of these patients experienced these effects, but several had drug rashes and fever. Similar favourable results not only in lobar pneumonia but in bronchopneumonia and pneumococcal bronchitis are described by D. S. Pepper and G. C. Ham[3]; these authors gave particular attention to urinary complications, and found microscopic haematuria in four out of fifty-two cases, while crystals of acetylsulphathiazole were found in the urine of no fewer than twelve. F. W. Sunderman and D. S. Pepper[4] have determined that acetylsulphathiazole is about twice as soluble in alkaline as in acid urine, and advise the administration of alkalis in order to prevent crystallization in the urinary tract.

Meanwhile a new sulphonamide compound has made its appearance in the U.S.A. which seems in some ways to constitute a further advance. This is 2-sulphanilamidopyrimidine ("sulfadiazine"). Careful studies of its toxicity in several animals as well as its therapeutic effects have been made by W. H. Feinstone and others,[5] and a communication by Perrin H. Long[6] to the English medical press contains the assurance that favourable conclusions based on animal experiments have so far been well borne out in clinical trials. Although even less soluble in water than sulphapyridine, sulphadiazine is much more soluble in blood: it is adequately absorbed and reaches blood concentrations considerably higher than those of sulphapyridine. Both because of a low degree of acetylation and because acetylsulphadiazine is more soluble in urine

[1] *Proc. Mayo Clin.*, 1940, 15, 651.
[2] *Amer. J. med. Sci.*, 1940, 200, 773.
[3] Ibid., 784.
[4] Ibid., 790.
[5] *Johns Hopk. Hosp. Bull.*, 1940, 67, 427.
[6] *Lancet*, 1941, 1, 259.

than other conjugated sulphonamide compounds, there is little reason to fear urinary tract complications; indeed, renal damage in monkeys rarely occurred even when blood concentrations of 20 mg. per 100 c.cm. were maintained for long periods. The general conclusion from Feinstone's experiments is that sulphadiazine is less toxic than either sulphapyridine or sulphathiazole, and on the clinical side Long reports entire absence of nausea and vomiting in eighty treated cases, with one case each of drug fever and drug rash. Sulphadiazine is said to be the equal of other compounds in treating streptococcal, pneumococcal, and staphylococcal infections and to excel in the treatment of infections by Friedländer's bacillus. These authors hesitate to assess relative therapeutic values because the blood concentration attained with sulphadiazine is so much higher. Theoretically this qualification is important; practically all that matters is the therapeutic effect obtainable from adequate but safe dosage. We shall doubtless hear much more of this drug.

BIOLOGICAL EFFECTS OF SHORT RADIO WAVES

That the biological effects of short radio waves are due solely to the heat produced in the tissues and not to any specific action is now generally accepted, thanks largely to the careful work of Dickens[1] in testing the claim that the 3-metre wave-length had a specific effect on cancer. This claim remained unrefuted chiefly because of the difficulty of measuring the actual temperature of the tissues, but by the use of a specially constructed copper-constantan thermocouple and by critical tuning of the transmitter Johnson[2] has now been able to maintain tissues within $\pm 0.1°$ C. of a selected temperature for several hours, both *in vitro* and *in vivo*. Provided that physiological conditions are maintained *in vitro*, the thermal death times can be measured with accuracy, being twenty minutes at 47° C. for both the Walker rat carcinoma and the Jensen rat sarcoma, and three hours at 43.5° C. Jares and Warren[3] found that the thermal death time at 41.5° C. was about thirteen hours, while temperatures below this had little destructive effect. This temperature can be maintained in the human subject for perhaps twelve hours without a fatal result, although Warren[4] has not so far maintained it for longer than five hours. Johnson shows, however, that the thermal death times *in vivo* for the rat tumours were about twice as long as *in vitro*, being six hours for the Jensen sarcoma at 43.5° C. There was, moreover, a difference in susceptibility to heat *in vivo* which was not present *in vitro*, the Walker rat carcinoma being twice as resistant as the Jensen rat sarcoma. There are several differences between the action of heat and that of *x* rays, as the radio-sensitivity of malignant growths is usually much greater *in vivo* than *in vitro*, while the histological changes resulting from heat bear no resemblance to those due to *x* rays. Johnson also found that while heating *in vitro* for the thermal death time resulted in failure to "take" on transplantation, there was no cessation of metabolic activity. This observation may be the explanation of Warren's clinical experience of artificial pyrexia—that while definitely destructive to the tumour it did not prevent its rapid recurrence. In Johnson's experiments also there was usually a swelling of the tumour of about 30% immediately after heating, which persisted for some twenty-four hours and might well be a danger clinically. His conclusion is that there is as yet no evidence that malignant tissue is more susceptible to heat than normal tissue, but the occasional regression of a tumour in man following an acute febrile illness and the successful use of toxins by Coley in the treatment of bone sarcoma must be borne in mind. A combination of *x* rays and heating was being tried by Schinz before the war, but the skin tolerance to *x* rays is definitely reduced by heating, so that what might be gained by the added destructiveness of heat on the tumour may be lost by the lowered *x*-ray dose possible without damage to the skin. There are many problems in the heating of tissues well worth investigation, and Johnson's paper has cleared the ground ready for clinical research.

[1] *British Empire Cancer Campaign, 14th Ann. Rep.*, 1937, 112.
[2] *Amer. J. Cancer*, 1940, 38, 533.
[3] *Amer. J. Roentgen.*, 1939, 41, 685.
[4] *The Treatment of Cancer*. Edited by Pack, G. T., and Livingstone, E. M. P. Hoeber, New York, 1939, p. 2539.

SURGICAL TREATMENT OF ANGINA PECTORIS

The attainment of precision in our conceptions of the nature of a disease rarely fails to stimulate therapeutics. The accumulation of evidence for the theories that the pain of angina pectoris is due to the accumulation of pain-producing substances released by an imperfectly oxygenated myocardium, and that in angina of effort the essential anatomical lesion is narrowing of the coronary artery, has led to several attempts to improve the condition by surgery. Attempts to remedy the fundamental disturbance in the arterial supply to the heart muscle have been made by Beck[1] and O'Shaughnessy,[2] the former grafting pectoral muscle and the latter omentum to the heart. Both operations appear to provide new collateral vessels to the myocardium, and published case reports indicate some improvement in the clinical condition of the patients; but it is not yet known to what extent these operations lengthen life. Mansell[3] reported in 1940 that seven of O'Shaughnessy's original fifteen patients were dead. Another operation which has not yet passed the experimental stage is proposed by Fauteux[4] of Montreal, who has found in dogs that the high mortality from resection of the ramus descendens of the left coronary artery is reduced by previous ligature of the vena magna cordis; he proposes venous ligation to prevent subsequent attacks of coronary infarction and to relieve angina of effort in man. This operation is an example of a practice in surgery based on a principle which is not recognized by orthodox physiology; for while every physiologist would agree that venous ligation increases venous and capillary pressure, it is difficult to see how it accelerates blood flow, which is one of the effects claimed. A rather different approach to the relief of angina is to interrupt the sensory nerves carrying the pain impulses from the heart by removing the upper thoracic sympathetic ganglia or by injecting them with alcohol. Successful operations yield results that appear to be eminently satisfactory in relieving anginal pain, and there is no evidence that the patient who is deprived of the warning to limit his activity lives a shorter time thereby. But there are few cases of angina in which the pain is unilateral and in which interference with the nerves on one side suffices to abolish the pain. The operation is an extensive one, and the alternative alcohol injection, unless performed most skilfully, is apt to be followed by intractable intercostal neuralgia. Finally we come to an operation the basic principle of which remains comparatively obscure—namely, total thyroidectomy. This was introduced by Levine and Blumgart to relieve congestive failure, and was based on the well-known benefits conferred on the heart in Graves's disease by subtotal thyroidectomy. It aims at reducing the

[1] *Surg. Gynec. Obstet.*, 1937, 64, 270.
[2] *Lancet*, 1938, 1, 76.
[3] *Proc. roy. Soc. Med.*, 1940, 33, 542.
[4] *Surg. Gynec. Obstet.*, 1940, 71, 151.

cardiac work by diminishing the basal metabolic rate, which after operation can be maintained at the desired level by administration of thyroid. Although it has now largely been abandoned as a therapeutic measure for congestive failure in the absence of hyperthyroidism, it survives in the treatment of angina of effort, and published series of cases suggest that it has been of real benefit in many. Thyroidectomy was thought at one time to relieve angina by intercepting the sensory paths, but it seems more probable that the results are directly or indirectly due to removal of thyroid secretion, as in many patients relieved by operation pain recurs if too much thyroid is given.

The reader of most of the original papers dealing with cardiac surgery is apt to emerge with a confused idea of what these operations do and of when they should be employed. That there is doubt as to the effects of these operations is regrettable. Every therapeutic measure constitutes an experiment. Results can in many instances be assessed with considerable accuracy, and in few more accurately than in angina of effort, for in this disease Wayne and his colleagues[2] showed that the amount of exercise, performed under standard conditions, which is necessary to produce pain is remarkably constant. It is therefore a simple matter to demonstrate what measures increase and what diminish exercise tolerance. Repeated exercise-tolerance tests under standard conditions could scarcely fail to throw new light on the precise effects of these various operations. As to their place in the treatment of angina, most would agree with Sir Maurice Cassidy in his remarks concluding a discussion on the subject at the Royal Society of Medicine[1]: "As I tell all my anginal patients, this is a much-maligned disease. We are impressed by those unfortunates who succumb to or are crippled by coronary infarction; we forget those very numerous patients who live to a ripe old age in spite of their angina, or die from some other disease. Some of them *in fact cease to have angina; others learn* so to regulate their lives as not to be worried by anginal pain. Nevertheless, I agree that there is a limited scope for surgery in the treatment of this disease." In our present state of knowledge the most suitable patients are those whose lives are rendered excessively difficult by restricted exercise-tolerance or unbearable by repeated attacks of severe pain at rest. Choice of operation will be determined to some extent by the nature of the surgical skill available, but should become a simple matter as experience accumulates.

EOSINOPHILS IN THE DIAGNOSIS OF RESPIRATORY ALLERGY

The relation of eosinophils to hypersensitive states, in both man and laboratory animals, has for many years attracted the attention of clinicians and pathologists. In the laboratory, guinea-pigs and dogs are most commonly used for the study of induced protein hypersensitivity or anaphylaxis. Both species may show an increase of eosinophils in the circulating blood or internal organs during anaphylactic shock. The symptoms of acute anaphylactic shock closely resemble those which follow the injection of histamine, and probably depend on the liberation of histamine-like substances from the tissues of the test animals. This has been substantiated by the demonstration that the blood histamine is increased during acute anaphylactic shock.[3] That the eosinophilia and increased blood histamine may be intimately related is suggested by the high histamine content of eosinophils as compared with the other cellular and fluid constituents of blood.[4] These findings make it probable that eosinophilia can be regarded as an aid to the diagnosis of an anaphylactic reaction in so far as it denotes an excessive liberation of histamine. Although it is dangerous to draw analogies between anaphylaxis in laboratory animals and allergy in man, it is probable that the symptoms of both these hypersensitive states depend on the same mechanism. Eosinophilia in the blood and tissues of cases of suspected allergy can therefore be regarded as a valuable aid in the diagnosis providing it is combined with a thorough clinical investigation and the final diagnosis is made on the demonstration of an abnormal sensitivity. An increase of eosinophils in the blood and bronchial secretions is already well recognized as an aid in the diagnosis of asthma. In hay-fever, blood eosinophilia has been found less regularly, but the presence of eosinophils in the nasal secretion has been observed and used as a diagnostic sign. In a paper for which the author was awarded the Casselberry Prize of the American Laryngological Association for 1940, French[5] reports on a series of some 2,000 cases of nasal allergy in which the diagnosis was based on a cytological study of the nasal secretions together with a thorough clinical investigation, including hypersensitivity tests. In many cases repeated examinations were made, and from the collected data the author was able to correlate cytological findings in the secretions with the pathological condition of the nose and accessory sinuses. He deduces from this that the presence of eosinophils in significant numbers is evidence of an allergic state; a large preponderance of polymorphs, on the other hand, indicates an acute inflammatory complication or the stagnation of secretions. The findings suggest that in the diagnosis of common diseases of the nose and paranasal sinuses a cytological examination should be regarded as essential, and would ensure greater accuracy in the diagnosis of allergy. The recognition of the allergic basis of many common inflammatory and hyperplastic conditions of the nose would result in a reduction in the number of unnecessary surgical operations.

[2] *Clin. Sci.*, 1933, **1**, 287.
[3] *Proc. roy. Soc. Med.*, 1940, **33**, 543.
[4] *Amer. J. Physiol.*, 1933, **123**, 40.
[1] *J. Physiol.*, 1937, **88**, 435
[5] *Ann. Otol. etc.*, St. Louis, 1940, **49**, 579.

The *Bulletin of War Medicine* for January, the third one issued by the Medical Research Council, well sustains the excellent standard of the previous two issues and should be indispensable to all those engaged in meeting the various medical and surgical problems of war. The current volume opens with a summary of the Conference on the Treatment of War Wounds which was organized by the War Wounds Committee of the Medical Research Council last November. Then follow seventy pages of detailed abstracts of various articles relating to war medicine that have appeared in the world's medical literature. It may be noted that there are, in addition to the usual sections, short sections on industrial hygiene, food and drink, general sanitation, and organization.

The announcement of the retirement of Dr. H. A. Macewen from the post of Senior Medical Officer of the Ministry of Health will be received with very real regret by the members of the Public Health Service of the country. His work, especially during recent years, brought him into close official contact with many medical officers of health, to whom he became friend and adviser. Dr. Macewen covered a wide range of subjects in his official capacity, including control of infectious diseases, isolation hospitals, water supplies, sewage disposal, port hygiene, and surveys of the health services of local authorities. His knowledge of all branches of public health work is encyclopaedic.

REGIMENTAL MEDICAL PRACTICE

BY

HARRY POZNER, M.R.C.S.

Captain, R.A.M.C.

It is often asserted that when a doctor joins the Services he exchanges his stethoscope and clinical acumen for a sword and a uniform. That this impression is entirely erroneous has readily been appreciated by many general practitioners who accepted emergency commissions on the outbreak of war. Indeed, the scope of the regimental medical officer is surprisingly wide and comprehensive. There are certain factors which give the Service doctor a new angle, as it were, on medical practice. First, in a unit which may contain approximately a thousand men there are few, if any, cases of chronic disease. The problems with which one meets are almost entirely those of preventive medicine and administration. Among the many functions which the R.M.O. has to assume are those of medical adviser to the commander of the unit to which he is attached, medical officer of health, sanitary inspector and engineer, and, above all, that of a medical educator. There are in addition unique opportunities for clinical observation and for experiments in preventive and therapeutic medicine.

The time which any unit has to spend in action is small compared with its sojourn in rest camps, barracks, and billets, and it is to the consideration of the commonest ailments met with under these conditions that I shall devote the rest of this short article.

General Considerations

The numbers of men on sick parade naturally vary from day to day and from season to season, but from the records which I managed to keep for about a year, both in England and abroad, certain facts have emerged. The sick rate in any unit of which I have been medical officer has, with one exception, never exceeded 2½% of the total strength. This one occasion occurred in the mid-winter of last year, when a short but particularly virulent type of influenzal epidemic swept through the troops in Southern England and brought about a daily sick rate in my unit of from 3 to 9%. It also gave most of us a salutary lesson in the principles of preventive medicine. Changes in the medical officer and the moving of a unit from one area to another invariably cause an increase in the number of men reporting sick. Malingering—a beloved tradition in the old armies—is now, I believe, fast disappearing, and I have been very fortunate in meeting few of these cases. Many of these men, who previously had been cursorily diagnosed and dismissed as "lead-swingers," present genuine psychological problems, and they react satisfactorily to firm but sympathetic treatment.

Surgery

In surgery the scope of the R.M.O. is naturally limited in regimental practice to diagnosis and the minor practical procedures. Acute pyogenic infections can be treated adequately at regimental detention quarters and camp reception hospitals, and the increasing use of sulphonamides and the tendency towards conservative measures have produced the most favourable results.

The surgical armamentarium of the regimental doctor is small, but it is entirely adequate for his purpose. In the past year there have been many improvements, and to-day the field medical pannier contains a compact roll-up case of surgical instruments, a convenient efficient sterilizer, and, among other refinements, an electric auriscope.

Apart from accidental injuries, the commonest cases met with in my experience are orthopaedic problems. Injuries to bones are frequent, and recently I have had a series of six cases of fracture occurring in the region of the wrist. As with all bodies of young and athletic men, there have been the usual cases of internal derangement of the knee-joint, and where it has been deemed expedient these have been recommended for operation.

Acute abdominal conditions are rare, but they do occur, and often at the most inconvenient times. This was impressed on me during the advance through Belgium, where in the space of a week there occurred one case of acute appendicitis and two cases of perforated gastric ulcer which had previously given no symptoms. This suggested an interesting problem whether there was any connexion between the imminence of the battle and the onset of the acute conditions.

During the "blitz" and in coastal defence work there have been opportunities of treating wounds due to machine-gun fire and bomb fragments. These have all done very well when treated on the principles that have been so clearly defined by Ogilvie in his papers on war surgery. Burns of first and second degree react well to tannic acid jelly, and it is hoped that one may have the chance of testing the efficacy of silver nitrate and gentian violet in such cases. Minor surgical conditions such as haemorrhoids and sprains are frequent, and the treatment of these is on routine lines.

After the return of the B.E.F. many men reported sick with chronic suppurative otitis media, dating in the majority of cases to some heavy bombardment to which they had been subjected. These were long and tiresome cases, but it was found that they could be treated satisfactorily in the unit M.I. room by a preliminary gentle cleansing with a mixture of surgical spirit and distilled water and subsequent insufflation with iodine powder.

Before leaving this short account of regimental surgery I would like to express my appreciation of the surgeons attached to the local E.M.S. hospitals I have had occasion to use. They have always been willing and generous in their co-operation, and I have learnt much from watching their progressive technique.

Medicine

The field of regimental medical problems is extensive and provides a wide variety of cases. The therapeutic agents at the disposal of the R.M.O. are of necessity limited in number, but they are reliable and have withstood the tests of long usage. Indeed, the experience gained in employing only a small number of medicines has proved valuable at the present time, when medical supplies of unnecessary drugs have been diminished by the war.

In any well-managed unit the amount of chronic sickness is very small, and tends to be typical of that unit. For example, in any detachment of men in the Pioneer Corps—a body of more elderly soldiers—one invariably finds cases of chronic bronchitis and of arthritis. Regular battalions which have seen service in the East generally possess a case of malaria or of dysentery. But in the main the ailments demonstrated differ from those found in civilian practice only in the diseases peculiar to any large body of men who are forced to live in close proximity, sometimes under poor and unhygienic conditions.

Preventive medicine should be the constant guiding light of any R.M.O., and it is perhaps due to the realization of this that in the winter of last year were averted epidemics of cerebrospinal meningitis that might have proved disastrous. It must be persistently emphasized to commanding officers that the effective isolation of one man with a cold may prevent the unit from being decimated by a disabling illness. In every battalion there are now regimental detention quarters, where a man with a cold and a high temperature may be kept isolated and under observation for forty-eight hours.

Medical abdominal conditions are common, and one sees a number of cases of acute gastritis and peptic ulceration. The greater part of these do very well under the routine hospital treatment; but it has been observed that there is often an associated psychoneurosis. The stock complaints of the Army—constipation and its concomitant diarrhoea—are still in evidence, and much is being done, on the lines of investigation into diet and the bacteriology of food poisoning, to eliminate these conditions completely.

Perhaps the two chief problems which confront the R.M.O. are those of scabies and impetigo. Scabies may appear sporadically in a unit, especially when it has moved to another area, and the efficient control of its spread may often be an urgent question. Immediate disinfestation of clothes and blankets is of paramount importance, but the treatment of the individual has passed through many phases. The evolution of the treatment of scabies has seen the temporary popularity of sulphur ointment, Marcussen's ointment, sodium thiosulphate, and dilute hydrochloric acid, and now interest is being concentrated on the use of benzyl benzoate. With the latter some good series of results have been obtained, with very few instances of recurrence. Impetigo, although not disabling, is disfiguring, and takes a course which is long and tedious, both to the patient and to the doctor. Here again many methods, such as a weak solution of acriflavine, or mercury and ammonium ointment, have been tried. I have found that many cases react quickly and favourably to certain proprietary streptocidal preparations, and more recently to a 2% aqueous solution of gentian violet. Pediculosis, even on active service, is no longer the bugbear that it was formerly.

Certain nervous problems peculiar to the circumstances of this war have often presented themselves. These conditions, which are mostly anxiety neuroses, I have found in the older men employed in pioneer work, and in younger men who are stationed in isolated coastal defence areas The predisposing factors have commonly been worry about bombed-out evacuated families, and also the continuous nervous tension of waiting for "something to happen." A careful and accurate investigation and subsequent treatment by suggestion and encouragement have in most cases resulted in great improvement.

Abroad I saw a few cases of war hysteria. These exhibited two main syndromes. The first was automatism, and the patient tended to reproduce his actions and emotions prior to evacuation. The second and much more noticeable group was the one which exhibited facial immobility, hunched shoulders, and muscular rigidity, conditions remarkably comparable to those of Parkinsonism. These men were easier to handle, and in some instances were able to return to their normal duties after a short period at the regimental aid post.

Venereal disease, in my experience, is decidedly on the decrease. This is probably due to a wider spread of knowledge on the subject, the better education of the soldier, and the encouragement of prophylaxis. Practically all the cases I have seen are of gonorrhoeal urethritis, and have generally been relapses of an infection incurred before the war.

Active Service

No rules can be laid down for the conduct of the R.M.O. on active service. Each battle presents its own difficulties. The increasing trend towards more mobile warfare leaves the doctor further behind, and there must necessarily be a greater time-lag between the time a man is wounded and when he is seen by an R.M.O. It is not necessary to elaborate on the problems which confront a doctor in the front line, but attempting the minimum amount of emergency surgery in a shell-battered estaminet with the aid of two candles and few amenities is something to be personally experienced before it can be fully realized. With his functions so constrained in battle, he must become an expert in preventive medicine before a campaign, and during it be a constant source of encouragement to the men.

The R.M.O. holds a peculiar position. Although only attached to a unit he is as much an integral part of it as the commanding officer or the newest recruit. Correspondingly, he must identify himself with its aims and traditions. If he is to mean anything at all to a unit he must as a trained professional man mean everything that is decent and steadfast and sane.

I am indebted to Colonel J. C. Dowse, A.M.S., for permission to publish this article.

Nova et Vetera

SOME TEXTBOOKS OF FIFTY YEARS AGO

[FROM A CORRESPONDENT]

The other day I took down from its shelf an old favourite bought fifty years ago—namely, a first edition of *Life's Handicap*, published early in 1891, when Kipling was, I think, 25 years old. For no reason I can explain, after reading two or three of the stories, old friends, I began to turn over the leaves of the publisher's (Macmillan's) advertisements at the end of the book. Here, sandwiched between all kinds of other publications—hosts of sermons, editions of Greek and Latin classics, forgotten minor poetry, stacks of instructional and devotional works, and a certain number of novels (William Black, Marion Crawford, Thomas Hardy, Henry James, Bret Harte, Rolf Boldrewood, Charlotte Yonge, and others)—were quite a number of medical works: evidently the output of textbooks was a less specialized business then than it is now.

The first I lighted upon, going through them alphabetically, was Dr. T. Clifford Allbutt on the ophthalmoscope, then, we may suppose, a toy with which few general practitioners had any great familiarity. McCall Anderson's *Lectures on Clinical Medicine* comes next, of somewhat lesser interest, one imagines. Then follows Richard Barwell on *Curvature of the Spine*; and on *Aneurysm, especially of the Thorax and Root of the Neck*: possibly the former may be less "dated" than the latter. Next is Charlton Bastian on *Paralysis from Brain Disease*, no doubt still well worth reading, for he was an acute observer. Lauder Brunton is represented by six publications, three of them on pharmacology, therapeutics, and materia medica: these were still being read several years later. Bucknill on *The Care of the Insane* is perhaps forgotten by now—I do not remember ever hearing of it, though it may have been a useful work once. Brudenell Carter's *Diseases of the Eye* was a landmark in its day, and he is also represented by two smaller books on *Eyesight* and *Operations for Cataract* respectively. Carter was one of the first ophthalmic surgeons who practised as pure specialists in this country. He served as a surgeon in the Crimean War, and was a leader-writer on the staff of the *Times* for fifty years.

Cholera Epidemics in East Africa, by J. Christie, makes one think a little: Kenya and Tanganyika were in their earliest infancy, and the places where these epidemics were studied may have been Zanzibar, Mombasa, Beira, Quilimane, Sofala, and other coastal settlements. Michael Foster's *Physiology* had reached its fifth edition—stiff reading for beginners: Foster and Langley's *Elementary Practical Physiology* (a better book from the medical student's point of view) was already in its sixth edition. Dr. J. M. Fothergill was the author of three books, two on treatment and one on invalid diet: one was in a second and one in a third edition, so they were certainly being bought. Wilson Fox on *The Artificial Production of Tubercle in Animals*, and on *The Treatment of Hyperpyrexia*, sounds more interesting than W. H. Griffiths on *Prescriptions and the Art of Prescribing*, which, possibly quite wrongly, suggests the elegant mixture of some twenty or thirty ingredients, all perfectly useless but with not an incompatible amongst them. Hamilton on *Pathology*, vol. i, 25s., was evidently a textbook on the grand scale for those days, when pathology was not such a veteran science as it is to-day. Dr. Sophia Jex-Blake's *Care of Infants* would probably be nearly as useful to-day as it was half a century ago—doubtless many of the middle-aged in our profession were brought through early troubles by its use. *Klein on Micro-organisms* was in its third edition—a good book at the time too. J. A. Lindsay's *Climatic Treatment of Consumption* would probably not be of much value to this generation, though Sir Morell Mackenzie's *Hygiene of the Vocal Organs* may still have valuable lessons (it had got to a seventh edition). Surgeon General W. C. Maclean was the author of a *Textbook of Tropical Diseases*, soon to be eclipsed by Patrick Manson's classic, one may presume. More interesting are Henry Maudsley's *Physiology of Mind*

and *Pathology of Mind*, the latter more expensive than the former and doubtless larger. Charles Mercier (did any medical author ever write purer or more limpid English?) is represented by *The Nervous System and the Mind*, still a mine worth prospecting, one feels sure. Lauder Brunton, Donald MacAlister, and Mitchell Bruce were editing the *Practitioner* (then published by Messrs. Macmillan); Russell Reynolds, a *System of Medicine* in five volumes. Benjamin Ward Richardson was writing on alcohol, on sanitation, on hygiene, and on preventive medicine; Sibson's collected works were on sale in four volumes at three guineas. The *International Encyclopaedia of Surgery*, in six volumes, was edited by J. Ashhurst, jun., professor of clinical surgery in the University of Pennsylvania. Last, but very very far from least, is W. Hale-White's *Textbook of General Therapeutics*. I wonder whether Sir William still has a copy of it in his library?

RAMAZZINI AND INDUSTRIAL DISEASE

Ramazzini (1633–1714) was well known as a doctor at Modena, in Italy, who late in life became a professor of medicine at Padua. He wrote in 1700 *De Morbis Artificum*. Working among his patients at Modena he was attracted by the miserable condition of the wretched class whose duty it was to empty the cess-pits of the houses in the city. These cess-pits were only emptied once in three years, and he found that the men could only work four hours a day and were invariably ill. This led him to inquire into the industrial diseases in other groups of workers and thus led to the production of a book of great interest, often pillaged by other writers without acknowledgment. The second edition appeared in 1713. It is now published under the auspices of the library of the New York Academy of Medicine.[1] Written in Latin, it is translated by Mrs. Wilmer Cave Wright, Emeritus Professor in Greek in Bryn Mawr College. Her English translation faces each page of the Latin original. It is fluent and accurate. She has prefixed an excellent introduction, has appended notes, and given two indexes.

It is interesting to notice how such a book, on industrial diseases, written in the eighteenth century, differs from modern ones. Some of Ramazzini's observations were made from personal knowledge, others he knew only by report. He was widely read in the classics and quotes freely from Hippocrates, Pliny, and Galen. Although he is accurate in many points he was credulous, making little attempt to verify the opinions expressed by the ancients. He makes no allusion to such a condition as anthrax, but he lays stress on the effects of lead and mercury. The whole book reminds one a little of Burton's *Anatomy of Melancholy*, and may be read with profit and pleasure by the general reader as well as by those who desire to ascertain what was known of industrial disease at the time it was written.

[1] *De Morbis Artificum. Bernardini Ramazzini. Diatriba. Diseases of Workers.* The Latin text of 1713. Revised with Translation and Notes by Mrs. Wilmer Cave Wright. (Pp. 534. 30s. net.) Chicago: University of Chicago Press. 1940.

At a recent meeting of the Section of the History of Medicine of the Royal Society of Medicine, with its President, Sir Walter Langdon-Brown, in the chair, Dr. J. D. Rolleston read a paper on the medical aspects of Saint Simon's Mémoires, which covered the last twenty-four years of the reign of Louis XIV and the eight years of the Regency (1691–1723). He discussed the subject under the three headings of prevalent diseases, of which the most important were small-pox, malaria, syphilis, tuberculosis, gout, nervous and mental disorders, alcoholism, fistula in ano, and stone in the bladder; descriptions of contemporary physicians and surgeons, especially Fagon and Maréchal; and miscellaneous topics including longevity, sexology, spas, poisoning, post-mortem examinations, and the illnesses of Louis XIV.

Local News

ENGLAND AND WALES

Retirement of Islington M.O.H.

Dr. G. Clark Trotter has retired from the position of medical officer of health for Islington after nearly twenty years in the service of that borough. Previously he had been medical officer of health for Paisley and for Deptford. At a recent meeting at Islington town hall the mayor, on behalf of the staff of the public health department, presented Dr. Clark Trotter with an electric wireless set, and he and the mayoress also made a personal gift of books. The ceremony was presided over by Dr. V. Freeman, Dr. Clark Trotter's successor, who remarked that during the tenure of the late medical officer the infant mortality of Islington had fallen from 130 per thousand births to 60, while reforms such as slum clearance and the stopping of food adulteration owed much to his initiative. Speeches were also made by the chairman of the public health committee, the deputy medical officer of health, and the superintendent of the public health department. In acknowledging the compliments paid him Dr. Clark Trotter said that the work of the health department of such a large borough was by no means a one-man job, and without the support of his loyal colleagues he could not have carried through.

The Air-raid Shelter Problem

Lord Horder presided at a meeting of the Royal Empire Society on March 4, when Mr. T. L. Tanner, chairman of the Friends Ambulance Unit, spoke on the shelter problem. The position with regard to shelters, Lord Horder said, still remained not entirely satisfactory. The policy of his committee had been a dual one—a short-term policy aiming at rectifying the errors of last September, when the need for dormitory shelters suddenly arose, and a long-term policy summed up in the single word "dispersal." By dispersal he believed the maximum of safety and of hygiene could be obtained. He had been accused, he said, of stating that there was no such thing as an ideal shelter; what he had said was that there was no ideal large public shelter. But however satisfactory the small shelters (Anderson and domestic) might be, the persistent preference of people for the public shelters must be considered. These public shelters had become the framework of a new social existence. A strange thing, as Lord Horder commented, that an active communal life should start underground in conditions so primitive that it was a struggle to get any sanitation established. He hoped that one of these days a new turn in the war would make the whole of this troglodytism unnecessary. But the fact must be faced that there was a hard core of people who believed implicitly that public shelters were safer than they really were and as offering a more comfortable existence than anything above ground. Care must be taken, said Lord Horder, that underground slums were not created, that the casual shelterers, having passed through the transition stage of the dormitory shelter, did not become the inhabitant of an underground slum. He referred to some large underground shelters he had seen in the Provinces, with conditions worse than anything in London. The saddest spectacle was the children. It was all very well to say they should not be there at all, but the distrust of reception areas by their mothers must be reckoned with. Lord Horder still felt that dispersal was the best policy, but it took time to unload these large public shelters, and in the meantime the people who stayed in them must be kept safe and healthy and with as much spiritual happiness as possible.

Mr. Tanner said that overcrowding in the shelters had diminished both as a result of the provision of new shelters and still more the reduction in the frequency and length of night raids. There had been cases of cerebrospinal fever and measles and whooping-cough which might be attributed to shelter conditions, but as yet no large-scale epidemic. He thought there was room for improvement in the organization of doctors' rotas, and that sometimes the visits made by



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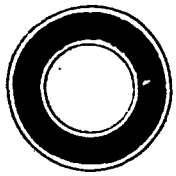
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doctors were perfunctory. The late Minister of Health had announced the setting up of medical aid posts and isolation wards. The former had been installed in shelters of over 500 capacity, but in many instances isolation wards were not to be found. While alive to the disadvantages of a large public shelter (the published reports of early shelter conditions were in no way exaggerated), Mr. Tanner pointed out that there was something to be said now on the other side, especially the opportunities for providing good food and food-education and recreational facilities and the fostering of a community spirit.

Correspondence

Abdominal Hyperaesthesia in Dyspeptics

SIR,—I am sorry that Captain W. G. Mills should have attempted to revive in your issue of March 1 (p. 315) a method of diagnosis which had been allowed to fall into well-merited oblivion for twenty years. I believe that cutaneous hyperaesthesia as a sign of organic disease of the stomach is quite valueless, and that when it is found it has invariably been produced by the unconscious suggestion of the observer. From the time when, as a student in 1903, I first read Head's work on the association of cutaneous hyperaesthesia with visceral disease I mapped out his areas in every case I saw in which an ulcer had been diagnosed. I watched its retraction from day to day until it finally disappeared, when it was assumed that the ulcer had healed. In 1909 I examined nine patients with duodenal ulcer the day before they were operated upon by Moynihan. Greatly to my surprise I failed to discover hyperaesthesia in any of these phlegmatic middle-aged Yorkshiremen. I soon realized that the cases I had previously examined were mostly highly suggestible chlorotic girls, who were not suffering from chronic ulcer at all. Since 1909, by taking care to avoid suggestion, I have never observed cutaneous hyperaesthesia in any of some hundreds of cases of ulcer. On the other hand, I have often suggested an area of hyperaesthesia away, replaced it by anaesthesia, or transferred it to the opposite side after it had been marked out by one of my clinical clerks.

It is curious that in the last war cutaneous hyperaesthesia over the heart was regarded by some physicians as evidence of D.A.H., a *functional* disorder, in contrast with Captain Mills's hyperaesthesia sign of *organic* gastric disease. The precordial hyperaesthesia, like the cutaneous hyperaesthesia over the shins, described by one medical officer as pathognomonic of trench fever, proved to be the product of the observer's own unconscious suggestion.

The remarkable suggestibility of the average soldier was demonstrated in 1918 by the discovery of anaesthesia of the pinna of the deaf ear in eighteen out of twenty-eight otherwise fit soldiers with unilateral organic deafness, compared with one out of nine civilians.[1]—I am, etc.,

ARTHUR HURST.

Oxford, March 1.

Hyperventilation and the Effort Syndrome

SIR,—Drs. E. Guttmann and Maxwell Jones, in their article on hyperventilation and the effort syndrome (November 30, 1940, p. 736) have questioned the theory that hyperventilation plays a role in the cause of the symptoms of the effort syndrome. As the originator of this theory (that effort syndrome represents an anxiety state with hyperventilation), I feel that a letter justifying my beliefs is warranted.

Most interested observers will agree that effort syndrome results from anxiety (fear) plus exertion under conditions of stress and strain. In my own experience those patients sent to me with this diagnosis made by impartial physicians invariably have had anxiety states and have had their major symptoms reproduced by voluntary overbreathing, even though they were not aware of the reason for going through this test. Most of these patients re-experienced their symptoms after doubling or trebling their respiratory volumes for one to three minutes or so, and in turn were relieved by breathing 2 to 5% carbon dioxide (mixed with pure oxygen or with 21% oxygen and 77 or 74% nitrogen respectively) for thirty to sixty seconds. When occasionally most but not all of the symptoms were reproduced by this procedure, it seemed to be due to the fact that sympathetic or parasympathetic stimulation, or both, had played a part in their spontaneous attacks. In our original publication (Soley, M. H., and Shock, N. W., *Amer. J. med. Sci.*, 1938, **195**, 840) these latter factors were not considered adequately, and they probably play a greater part in effort syndrome than we originally supposed. Of course, hyperventilation and sympathetic and parasympathetic stimulation can all arise from central nervous system overactivity caused by fear, anger, and other emotions. I believe that combinations of these responses to anxiety account for the variations in the clinical picture called the "effort syndrome."

If one considers palpitation and tachycardia only as effort syndrome, then it is obvious that these symptoms will not be caused alone, or even at all in some patients, by hyperventilation, since they are probably direct sympathetic effects or are partially mediated through the secretion of the adrenal medulla. But if one includes those symptoms described by Sir Thomas Lewis and Paul D. White as being characteristic of effort syndrome, then hyperventilation alone or with sympathetic and parasympathetic effects will produce this syndrome.

The rate at which the patients overbreathe is very important, since with too rapid a loss of carbon dioxide through the lungs the patients fail to experience the symptoms which appear following less rapid loss of carbon dioxide. In our first trials with hyperventilation we often made this error of hyperventilating patients too rapidly.

Inasmuch as effort syndrome is of such importance in the armies of both Great Britain and the United States, as well as in civil populations, any information which ultimately leads to the discovery of its aetiology should be a worth-while contribution.—I am, etc.,

MAYO H. SOLEY, M.D.,
Assistant Professor of Medicine and Pharmacology.

University of California, Feb. 8.

Trichiniasis in Britain

SIR,—In addition to the two Pembrokeshire outbreaks (1922 and 1939) mentioned in his letter of February 20 by Dr. Gillam, there was trichiniasis in a household near Swansea in June, 1930, affecting four persons acutely and one in very mild form. I investigated the outbreak in conjunction with Drs. Joseph Lloyd and J. Lloyd Davies and with officers of the Welsh Board of Health and the Swansea Public Health authority, and it was decided that a ham (purchased locally but probably originating from a Midland firm of wholesalers) was the source of the infection, though complete proof was lacking.

There was some evidence that the rapidity of swelling of the eyelids was correlated with the degree of severity of the disease.

Case	Swollen Eyelids	Severity	Eosinophils per c.mm.
A	13th day	Very severe	2,722
B	13th "	Severe	5,376
C	15th "	"	2,976
D	20th "	Moderate	1,500
E	Not seen	Very mild	1,060

In all cases the cell counts were made on the twentieth day after ingestion of the suspected ham. Although careful search for other cases in the district was made by the health authorities none was found, and ultimately all the patients recovered.—I am, etc.,

A. F. SLADDEN

Swansea, March 3.

Scabies

SIR,—I was interested in Dr. Bigham's letter on scabies in the *Journal* of February 22 (p. 294). In this district also scabies is endemic, but of late has assumed major epidemic proportions. Several factors have almost certainly contributed to the wide and rapid spread of the contagion. For example, it is known that Service men come home on leave while

[1] Hurst, A. F., Symns, J. L. M., and Gainsborough, R. (1918), *Scale Hayne Neurological Studies*, 1, 19. London. See also Hurst, A. F. (1920), *Crooman Lectures on the Psychology of the Special Senses*, p. 50. London.

infested. Crowding of persons together in air-raid shelters and a certain influx of people from other areas have greatly favoured the rising incidence of scabies.

The usual means of dealing with scabies by treating children at clinic baths and instructing mothers is not only inadequate but, in the vast majority of cases, a futile expression of hope. Formerly it was at least possible to keep the disease in check by such methods. To be of any value in present circumstances treatment must be extended not only to children but to the other members of households, most, if not all, of whom will be found infested. Herein lies the greatest difficulty. Post-school and adult persons do not often seek treatment for scabies in its early stages. It has been found that when they do the family doctor's instructions are disobeyed, particularly where staying off work is included in orders. In this area a large proportion of houses lack bathing facilities. Chemists are not infrequently consulted, and they supply sulphur ointment and advice. In some instances one or more members of a family may attain a state of partial or almost complete cure for a short time, but a vicious circle of reinfestation from kith and kin is kept going and we find a more or less chronic form of scabies. This is very often complicated by infection resulting in severe impetiginous or other septic sores. In my opinion the additional bathing and washing facilities afforded by decontamination stations will in no way relieve the situation. In my view hospitalization of whole families is the most efficient and, in the long run, by far the least costly way of dealing with scabies. Some areas may be fortunate enough to have available for this untenanted small-pox hospitals which could be utilized.

Victims of scabies lose sleep and rest—a state of affairs seriously affecting the working capacity of many engaged in nationally important industries. The treatment of the condition is indeed one which merits the attention of civil defence authorities. It is therefore suggested that, where possible, staff difficulties be obviated by seconding auxiliary and assistant nurses from other civil defence duties to that of combating the scabies scourge. Under such a scheme as the foregoing it should be possible for scabietics to follow their employment, going to work from hospital and returning there until cured. In the meantime the houses vacated should be "fumigated," so that on the families' return after a few days' to a week's treatment there should be no risk of reinfestation.

I heartily agree with Dr. Bigham that the present situation regarding scabies is one requiring urgent and nation-wide attention. My suggestions may be practicable in certain areas; in others such methods will be out of the question and, as in everything else, local conditions will govern whatever measures may be taken. It would be interesting to get the views of others dealing with this problem.—I am, etc.,

N. M. MACDONALD

Department of Health, Rotherham, March 3.

Control of Lice

SIR,—I have read with considerable interest Prof. P. A. Buxton's article on the control of lice in the *Journal* of November 2, 1940 (p. 603).

During the typhus epidemics which have occurred in this town of recent years we have naturally been interested in the destruction of lice on clothing and on people; and in the course of certain very crude experiments we made a somewhat interesting observation which, in spite of the crudeness of the experiment, appeared to be a quite definite fact—namely, that ammonia (that is, ordinary solution of ammonia), if added in varying percentages from 2 to 4, increased the toxicity of cresol products in a most astonishing way, and, furthermore, that crude cresols containing large amounts of quinoline and naphthalene products were very much more effective than the more purified types.

We used these solutions to supplement our inadequate steam disinfection facilities, but it seems to me that the information may be of value to people in a better position to perform accurate experiments than we, as a purely routine establishment, are. Incidentally, we found this crude solution was not without value in diminishing the incidence of bed bugs in camps.—I am, etc.,

J. H. JORDAN.

Public Health Department, Shanghai, Jan. 16.

Air-raid Casualties

SIR,—You are to be congratulated on publishing the very frank account of some recent air-raid casualties by Dr. Margaret Ball and Mr. George Quist (February 22, p. 273), disturbing though it is in several respects.

That replacement of fluid is not sufficient in itself to overcome severe shock is a conclusion which to many will not be unexpected in spite of recent more optimistic reports. Whatever the end-results it would seem to many that there is a nervous factor still undetermined which is, of course, quite unaffected by mere administration of fluid, and, indeed, it would seem that it is probably only those persons with a certain nervous make-up who do show shock in its very worst forms. It would be of value to know if there were patients amongst those treated on this occasion whose injuries were apparently as severe and yet in whom shock was less marked.

The other and more disturbing fact noted by Ball and Quist was the delay in operating on two patients who later developed gas gangrene and in whom quite frankly they believe the delay was a not unimportant factor in the development of this most serious complication. One cannot help thinking that with other emergency hospitals within a stone's throw this might have been avoided. The fact that casualties occur on one or other side of a thoroughfare should be no excuse for using hospitals in one sector only, as would seem to have happened in this instance.—I am, etc.,

March 2. W. L. TEMPLETON.

SIR,—It is a little difficult to supply all the data requested by Dr. W. F. Bensted-Smith (*Journal*, March 8, p. 379). Most of the casualties have been admitted within thirty minutes of the accident, and from within a half-mile radius; the importance of blast is almost impossible to determine. It is very likely that a lot of the tourniquets are applied by unofficial agents such as patients' friends, etc., but quite apart from its incorrect application it is doubtful that it is a good thing to cut off the blood supply to an injured limb, particularly when in most cases a local dressing will suffice to stop bleeding.

The estimate of results of resuscitation is complicated by the lack of uniformity in the standards of definition of shock in its various degrees, and any comparison of cases is thereby rendered difficult.—We are, etc.,

MARGARET BALL.

London, W.C.1, March 10. GEORGE QUIST.

First-aid Parties at Scene of Incident

SIR,—With reference to recent correspondence regarding the duty of first-aid parties at the scene of incident, I think it might be of interest to state that for some months we have been teaching our first-aid parties that rapid clearance (and only absolutely essential first aid) was their primary concern at a scene of incident. We cut out elaborate bandaging and splinting and stressed the importance of getting cases off to hospital as soon as possible. All our ambulances carry hot-water bottles. Tourniquets are seldom applied. Exercises in the dark are part of our training scheme.—I am, etc.,

G. C. F. ROE.

Halifax, March 5. Medical Officer of Health.

Too Much Morphine?

SIR,—Recent communications in the *Journal* give the impression that the administration of morphine has been almost routine in the treatment of serious air-raid casualties. It appears to me that far from being a life-saving measure the giving of morphine makes for death not life. Morphine depresses respiration, so that in "blast" cases it would seem to be particularly undesirable. The depression of the nervous system, moreover, in all probability diminishes retraction of the blood vessels and increases the danger of haemorrhage.

In the treatment of over ninety cases of almost all degrees of severity morphine was administered in only two cases; they were of minor but painful eye injuries. The behaviour of the injured was extraordinarily good. With the exception of one man with a fracture of the scapula, who was very fat and had great difficulty in finding a comfortable position, there was

scarcely a groan or complaint and gratitude and appreciation were freely expressed.

Two lessons were learnt. (1) Haemorrhage was not infrequently concealed by the covering up of wounds with large dressings of cotton-wool. It was found that half an hour's steady pressure by an attendant was often necessary to arrest haemorrhage from even a small wound. (2) The value of really hot applications, especially over the heart in cases of shock and (usually) exposure, was apparent. Relays of turkish towels "cooked" in a gas oven were used.—I am, etc.,

March 6. LENNOX JOHNSTON.

Amputation of the Index Finger

SIR,—Although surgical textbooks well-nigh universally proclaim that in operations on the fingers the absolute minimum of tissue should be removed and as much functional length conserved as is possible, I have often wondered if the short stump left by amputation of the index finger at the proximal interphalangeal joint is not more of an obstruction to the function of the hand than an aid.

Recently I had the good fortune to encounter the ideal authority to settle this question—a bootmaker who, because of injuries sustained in a factory accident several years ago, had his index fingers amputated in different ways: the right index was amputated at the proximal interphalangeal joint, and the left through the neck of the second metacarpal bone. On examination the stump of the proximal phalanx and its coverings are seen on the right hand; it is mobile and warm, and has the amputation scar on the dorsal surface. The skin over the free end is stretched and shiny, but is not tender to the pressure of an examining finger. The left hand has a neat and unobtrusive appearance, the neck of the second metacarpal having been divided obliquely; the scar is a dorsal one and not at all obvious. The grip of the left hand is more powerful than that of the right. This man is quite emphatic that his left hand is now the more useful one, despite the fact that he is right-handed, and he expresses the wish that he could get rid of the offending stump on the right hand. It is neither long enough nor strong enough to use in apposition to the thumb in grasping, and consequently the middle finger performs this function of the normal index finger, while the stump, encroaching as it does on the space between the thumb and the middle finger, is really an obstruction to this action unless it is dorsiflexed out of the way. In this latter position the stump is liable to receive knocks on its free end—an event which is followed by severe pain lasting for several hours. The loss of the index finger of the left hand causes little inconvenience, as the middle finger has assumed the role of the index with full competence. The man does not feel this hand to be any weaker than it was before the accident.

Surely the evidence of this illustrative case weighs heavily against the leaving of a short index stump, and favours oblique division through the neck of the metacarpal bone. The loss of the metacarpal head may weaken the architecture of the hand by the necessary division of the deep transverse ligament of the heads of the metacarpals; yet this is compensated by the improved appearance and the regularity of the important cleft between the thumb and the middle finger.—I am, etc.,

St. Andrews, Feb. 20. H. A. HANTON.

Cut Tendons: An Appeal

SIR,—Following my initial letter on this subject you have published correspondence from others who have testified that they also have never seen a successful result following digital flexor tendon suture by any known method. No one has come forward to champion the present routine method of suture employed throughout the land. We still teach students that flexor tendons should be sutured with full aseptic technique by an experienced surgeon, whereas it would appear that under all circumstances the finger is ultimately stiff and after weeks of unemployment—in the case of highly skilled men on work of national importance—the finger is finally amputated.

May I ask one pertinent question? Is there a single surgeon in the land—general or orthopaedic—resident medical officer—past or present—who has succeeded in establishing a return of movement (active) in the interphalangeal joints after any method of primary or secondary suture of flexor tendons within their digital sheath. If no such success has been obtained, is it not our duty to advise and carry out primary amputation and so get these injured workpeople back to work in as many weeks as it now takes months? If tendon suture is worth the effort and labour now expended, surely someone will sponsor it.—I am, etc.,

Sheffield, March 6 H. BLACOW YATES.

Vitamin K in Obstructive or Surgical Jaundice

SIR,—In his letter (February 22, p. 292) Dr. R. N. Herson takes exception to the statement in my article (January 25, p. 111) that lack of clotting power in cases of obstructive jaundice can be corrected by the use of vitamin K. I quite agree with him that not all of these cases will respond to vitamin K, and I am sorry if my remarks on the subject claimed too much for the treatment.

Lack of clotting power is due to prothrombin deficiency. Prothrombin is manufactured by the liver from vitamin K supplied to it from the intestine. For the absorption of vitamin K the presence of bile in the intestine is necessary, but this is denied it in cases of obstructive jaundice and it is necessary to supply the vitamin by some other means. If the liver is so hopelessly damaged that it cannot utilize the vitamin, then obviously the treatment is of little avail. The less the response of the liver to the treatment, the greater the hepatic insufficiency; in fact, the response might be taken as a measure of liver function.

The finding of white bile in the common duct, as in the case quoted by Dr. Herson, argues prolonged obstruction and superadded infection. In such cases the liver is so severely damaged that the outlook is poor whatever the treatment or however great the surgical skill. But happily the majority of cases of obstructive jaundice are not of this extreme nature, and the liver will be found to respond. It is advisable, if operation is undertaken, that the treatment with vitamin K should not only be carried out before but continued after operation. Where the response of the liver is not good the treatment must, as in Dr. Herson's case, be supplemented with blood transfusions. By blood transfusions prothrombin is supplied direct, though the increase in prothrombin by this means rarely exceeds 10% to 15%. Fresh blood is preferable because of its platelet content. Plasma, in these cases, is perhaps not as good as blood, certainly not as good as fresh blood. It has been estimated that the prothrombin content of stored plasma falls to 40% in the first week, and to 15% in three weeks.

I was not aware that undue claims had been made for the efficacy of vitamin K in cases of obstructive jaundice. Dr. Herson's letter suggests that such claims are common in the literature. Certainly many surgeons in America have testified to the benefit of the treatment in cases under their care. They have not hesitated, however, to draw attention to the fact that there were cases which did not respond to the treatment, and in these cases post-mortem examination showed that very little normal liver tissue could be found.—I am, etc.,

London, W.1. MICHAEL J. SMYTH.

Prosthetic Ulcer

SIR,—Mr. H. T. Simmons has performed a useful service in giving such a careful description (January 25, p. 119) of a not uncommon benign dental condition which, on account of its resemblance to carcinoma, is liable to lead to unduly extensive treatment and a pessimistic prognosis, as he points out. I have known such a case demonstrated as an epithelioma to a Fellowship course at a teaching hospital. He correctly states that the condition is not described in the surgical textbooks. The dental literature[1] contains several references, which are, however, rather inadequate. Prinz and Greenbaum,[2] and also Wright,[3] give fair descriptions, and the latter includes the histology.

Hyperplasia of the gum due to ill-fitting dentures is, however, well recognized by dental surgeons. Cases are not infrequently shown at clinical meetings, and I have personally

[1] *Oral Surgery*. By S. V. Mead. London, 1940. pp. 644, 1201.
[2] *Diseases of the Mouth and their Treatment*. London, 1935. p. 217.
[3] *Dental Cosmos*, 1934, 78, 911.

demonstrated two. The alveolar mucoperiosteum readily undergoes hyperplasia as the result of irritation, and I consider polypus of the gum, fibrous epulis, and this condition to be somewhat similar.

The term "prosthetic ulcer" is widely used to denote the small ulcers frequently seen in relation to a denture, whether due to lack of fit, excessive bite, hard foods, or other conditions. In the type described the basic change is a hyperplasia, as Mr. Simmons so well shows. It is usually ulcerated when seen by the surgeon, because it is the pain and fear of malignancy that cause the patient to seek treatment. I think this condition should be differentiated by the use of another name, for when the dentures are discarded there is no ulcer but the hyperplasia remains. "Gingival fibromatosis" and "gingival hyperplasia" can both be confused with other conditions, and "hyperplasia of the gum due to ill-fitting dentures" is probably the most accurate, if lengthy, term.

These patients already have excessive absorption of the alveolus, so that care must be taken in treatment lest cicatricial tissue develop and make the successful fitting of a stable denture still more difficult. I am interested that Mr. Simmons obtained good results by diathermy. Certain cases are suitable for excision and the insertion of buccal inlay. Slow but effective is the well-established method of ensuring that no dentures are worn for twelve to eighteen months, and this is often preferred by the frail and elderly patients subject to the condition. In the less severe cases drastic easing of the denture is sufficient, and I have one such case under treatment at present.

The prominence of Mr. Simmons's opening statement is unfortunate, for the statistics of a radium institute surely give no safe indication of the relative incidence of innocent and malignant tumours. Accurate statistics of this type are most difficult to obtain, but if odontomes are classed as tumours, it is my belief that tumours of the buccal cavity are more frequently benign than malignant.—I am, etc.,

London, S.W.1, Feb. 25. B. W. FICKLING.

Cyclical Mucosal Ulceration

SIR,—It would seem difficult to exclude recurrent herpes as an explanation of at any rate some cases of "cyclical mucosal ulceration" of the type Dr. M. H. Pappworth describes in his article (February 22, p. 271), and particularly of those in which ulcers are associated with menstruation.

When acquired in early life—the primary infection apparently being the common aphthous stomatitis of children—the herpes virus appears to persist more or less indefinitely, lying latent in epithelial cells until activated by some local or general disturbance, such as, for instance, the menstrual function. After the face, where of course it often recurs with extraordinary persistence and at regular intervals, sometimes in the same area each time, the commonest site for recurrent herpes is the genital region. Catamenial herpes is a recognized type, and certain women have an outbreak either around the mouth or on the genitals at nearly every menstrual period. Any portion of the vulva may be affected and occasionally the vagina and cervix uteri. In these situations or in the mouth, where the affection is certainly less common, the herpetic vesicles because of friction and maceration are ephemeral, being quickly transformed into superficial erosions so that the lesions may present a varied appearance.

Although as a rule herpes only affects one area at a time, it has been observed on a number of different sites simultaneously.

From Dr. Pappworth's description, the ulcers in his cases are suggestive either of herpetic erosions or of common aphthae. They were all apparently very small and superficial, were surrounded by an inflammatory halo, and were preceded by and associated with pain. They often appeared to begin as papules or vesicles and most of them lasted only two or three days. All healed without leaving scars. They would not seem to correspond to the lesions either of so-called "periadenitis mucosa necrotica recurrens" (Sutton, sen.), which begins as a painless submucosal nodule later necrotizing in the centre and leaving a crater extending well into the corium with marked induration of surrounding tissues, or to Lipschutz's "ulcus vulvae acutum," even of the milder veneroid type, in which new ulcers appear as old ones heal so that the disease lasts a month or longer. Moreover, relapse has been noted in only a small proportion of cases of this disease—one of Lipschutz's patients, for instance, had seven attacks in nine years.

Regarding Dr. Pappworth's statement that recidivating buccal and genital ulceration seems to be peculiar to women, Dr. Dowling some while back had a man under his care at St. Thomas's Hospital with severe and more or less persistent ulceration of the mouth in whom a number of ulcers of a more superficial though not herpetic type also appeared on the penis and scrotum. Dr. Dowling considered he probably came into Sutton's group. O'Leary (*J. Amer. med. Ass.*, 1932, **98**, 466) saw a case in a male in whom the posterior part of the scrotum and penis was involved in association with ulcers in the mouth. It is interesting to note that in one of Whitwell's cases (*Brit. J. Derm. Syph.*, 1934, **46**, 414), that of a man of 34 in whom mouth ulcers were associated with attacks of iritis, on one occasion four transitory herpetic erosions were observed on or behind the corona of the glans penis. Another of Whitwell's cases referred to by Dr. Pappworth, a woman of 29, had been subject to recurrent labial herpes provoked by colds or sunlight. These outbreaks were then replaced by weekly attacks of mouth ulcers of a deeper, more ulcerative type, with several of which were associated vulval ulcers.

The nature of these lesions, especially of recurrent buccal ulceration, which is a most trying and by no means uncommon affection, is certainly very puzzling, and there is at present much confusion in their nomenclature and classification.—I am, etc.,

Harley Street, March 1. E. W. PROSSER THOMAS.

Combined Trigeminal and Geniculate Zoster

SIR,—I have read with considerable interest the article by Major John D. Spillane on his case of combined trigeminal and geniculate zoster (February 15, p. 236). There is one point, however, on which I am a little uncertain, and on which the textbooks are not very helpful. I was under the impression, possibly mistaken, that a neurotrophic virus progressed along nervous connexions, and could not, so to speak, "jump gaps." If this is so the anatomical pathway suggested by Major Spillane is a little puzzling.

The greater superficial petrosal nerve (Birmingham nomenclature—Major Spillane says "superior," but presumably refers to the same nerve), although it lies in close relation to the ganglion trigeminale, does not actually connect therewith, and in fact does not pass through the cavum trigeminale, which houses the posterior part of the ganglion. The only possible true anatomical connexion seems to be via the internal carotid plexus, which gives branches to the ganglion trigeminale and to the deep petrosal nerve. This latter does connect with the greater superficial petrosal to form the nervus pterygoideus. These branches, however, are minute in the extreme. The external petrosal nerve is, by all accounts, so inconstant and so small that it seems risky to postulate it as a track for the virus, especially as again the connexion is only through plexuses on the internal carotid and middle meningeal arteries.

Of course, if the virus is not strictly limited to purely nervous pathways, then the question does not arise, but I should be interested to know if this is so. Major Spillane's article implies this in suggesting a route via the greater superficial petrosal nerve.—I am, etc.,

March 3. ROBERT G. W. OLLERENSHAW.

Damp Beds and Angiospasm

SIR,—In your issue of February 22 (p. 296) Sir Leonard Hill mentions the heat given out when dry clothing is moistened—as by the patient's skin. May I comment on the reverse of the picture and thus remedy an omission in my paper on "Blunders of Plain Muscle" (*Lancet*, September 27, 1937).

A good deal of body heat is needed to convert into vapour the water contained in cold underwear or bedclothes, especially

if they are damp. People with an enthusiastic circulation can usually supply this body heat. But there are certain people of the anxious, striving temperament who are liable to spasm in any of their tubes or sacs lined with plain muscle. This leads to asthma or migraine, spasm of the pylorus or colon, goose skin, cold extremities, and the like. When persons of this type undress in a cold room or get into a cold bed the arterioles of their extremities go into spasm. Unless aided by a hot bottle or hot bath their extremities remain cold and they cannot sleep till warmed. If the bedclothes are damp, their cold skins are unable to supply the considerable heat needed to vaporize the water in the damp sheets. Their fussiness about well-aired bedding, though well founded, makes them the laughing-stock of people with normal circulations.

I read that in Tibet a holy man will have his holiness assessed by sitting beside a hole in the ice while his friends drape his naked body with a sheet wrung out of the ice-cold water. His holiness is measured by the number of sheets he can dry successively by his body heat. I fancy five was the record! The test will at any rate eliminate any circulatory anxiety neurosis, and perhaps this may be one index of a mind completely satisfied by religion. For it is asserted by T. A. Ross in his book on psychotherapy that the truly religious never become neurasthenic. But in this country I fear our habits of comfort (and religion?) render most of us incapable of airing our own beds; certainly those liable to angiospasm cannot do so.—I am, etc.,

Hull, Feb. 25. FRANK C. EVE, M.D., F.R.C.P.

Experimental Human Scurvy

SIR,—The paper by Dr. F. W. Fox on experimental human scurvy (March 1, p. 311) raises some important points. We are asked to believe that the classical picture of scurvy is considerably overdrawn. In a quotation from Hess the implication is given that Lind stated that the indolent and slothful sailor was the first to suffer from scurvy. What Lind says (*Treatise on the Scurvy*, third edition, 1772: Postscript, Sect. IV: Observations on the Causes Productive of the Scurvy) is: "Lastly, troops that have undergone much fatigue, as also sailors who have worked very hard, may become afflicted with this disease; whence it may be also inferred, that confinement, sloth and indolence, though frequently, are yet improperly assigned, as causes of the scurvy." From Dr. Fox's article it would appear that the really active do not develop scurvy. Might it well not be that the indolent and slothful are so because of their lack of ascorbic acid?

With regard to the relation of gingivitis to scurvy the following quotations from Lind (*Scurvy in Hampshire*, p. 271) are of some interest:

"*In Haslar Hospital* the appearances of the disease were various. . . . The gums were not always affected. . . . Several complained of extreme weakness and a pain in the back." "The gums of several bled, being sore and spungy, without their having any other symptom of the scurvy. One person was greatly alarmed with a spitting of blood for three days, which I found to be no more than the scurvy affecting his gums."

—I am, etc.,

ROBERT COOK,
Lecturer in Biochemistry, University College, Dundee, University of St. Andrews.

Dundee, March 4.

Malignant Measles?

SIR,—Dr. Audrey Z. Baker writes (March 8, p. 380) that a case which she describes "may be worth putting on record" as one of "black" or malignant measles. Comment has already appeared in the daily press, but I doubt if it should be recorded in medical history as an additional case.

The description given by Dr. Baker is an excellent presentation of the symptoms, signs, and course of acute suprarenal insufficiency, usually known as the Waterhouse-Friedrichsen syndrome. While the aetiology of the condition is obscure it is relevant to inquire if there have been any cases of meningococcal meningitis in the district.—I am, etc.,

W. H. PATTERSON.

Booth Hall Hospital, Manchester, March 8.

Nurse Anaesthetists

SIR,—In his letter of March 1 (p. 339) Dr. W. Stanley Sykes accuses the University of Cambridge of taking a "retrograde step" and instituting "that bane of the second-rate American medical school—the nurse anaesthetist." This "retrograde step" has been taken by Addenbrooke's Hospital, which, apart from an arrangement with regard to elementary teaching and the provision of facilities for examinations, has no connexion with the University, the Governors directing and controlling the whole administrative work of the hospital. In fact, the honorary staff, though represented on the Faculty Board of Medicine of the University, did not bring this action to the notice of the University.

It is difficult to imagine anything more unworthy of a graduate of this university than Dr. Sykes's action in making this accusation, accompanied by a threat, without attempting to ascertain the facts from the Secretary of the Faculty Board or any other person competent to give him accurate information, or even consulting the Ordinances.—I am, etc.,

RAYMOND WILLIAMSON,
March 10. Secretary of the Faculty Board of Medicine, University of Cambridge.

SIR,—The following extract from a judgment given in the Superior Court of the Province of Quebec, and quoted by H. R. Griffith (*New York State Journal of Medicine*, 1940, 40, 213), is pertinent to this discussion:

"The following propositions are established: (*a*) that the administration of a general anaesthetic is a dangerous thing even to the point of possibly causing the death of the person submitting to it; (*b*) that during the anaesthetic surprises, complications, sudden and unforeseen situations, dangerous to the patient and capable of causing his death, may arise; (*c*) that with the presence of a physician specializing in anaesthesia the life of the patient might almost always be saved when a complication arises during the anaesthetic. . . . The administration of a general anaesthetic is at the same time a science and an art; easy, this science and this art, when all goes well, . . . difficult and exacting of skill and experience when a sudden and dangerous complication arises (these complications vary with the patient and never present exactly the same aspect), being able to cause death very rapidly, if a competent anaesthetist, experienced and knowing how to act quickly in this particular complication, is not ready to cope with it with the discretion, the precision, and ability which can come only with the union of medical science with experience. . . . An anaesthetic agent is a drug which shows its action by certain signs; by these symptoms and signs one knows what is happening to the patient; and to understand these signs and to judge what may arise it is necessary to know medicine. . . . A nurse has not the required medical preparation to be able to cope with an accident during anaesthesia. . . . The surgeon cannot and should not supervise the anaesthesia . . . all his attention and all his faculties should be concentrated on the operation itself without the preoccupation of accessory or extraneous things . . . when a critical situation does arise the surgeon, who should then suspend the operation, comes to assist the anaesthetist, but it is still the latter who remains always the person in charge of the security of the patient."

—I am, etc.,

Goodmayes, Essex, March 2. R. BLAIR GOULD.

Medical Planning Commission

SIR,—I am very glad to see the steady flow of comment and criticism which the Commission has evoked. There is, of course, room for diversity of opinion about its reference and its composition. I myself would much have liked to see more representatives of women and of youth on it, but the problem of selecting the latter is a very difficult one. Young doctors, unless they are predestined medical politicians, are usually too busy making their careers to take much interest in medical affairs, and at present most of them are engaged on something even more important and more urgent. But exception may rightly, I think, be taken to the argument that such a Commission ought to have been set up by some other body, preferably the Government. This point of view has been voiced by Sir Ernest Graham-Little and by Mr. Aleck Bourne,

Of course the former would naturally try to crab anything the Association did: I have always expected carping and ungrateful criticism from him and have never been disappointed.

Mr. Aleck Bourne is in a different category, and I should like to know just what he means by his statement that the chief reason for misgiving about the Commission is that it was "conceived and appointed by a private body which is by no means representative of the whole profession." A *private* body seems to me a somewhat unfortunate term to apply to one which is open to every registered practitioner; which contains a majority of all the practitioners in the country and of every kind of practitioner; and which frames its policy by a constitution which has been declared by good and independent authorities to be a democratic model. As for its representative capacity: what is Mr. Bourne's criterion for this? I suppose he does not insist that for a body to be representative it must include every potential individual. If he does then there is no representative organization of any calling in this country. The trade unions, for example, always consulted by the Government, have a smaller proportion of potential members than we have.

In my more active days the standard complaint was that the B.M.A. did nothing, or was always too late. Now it seems to be suggested that we should leave initiative to the Government. My view is quite contrary. If it be not the duty and the privilege of a body like ours to formulate its views as to the best way of using the profession for the good of the community, I think we had better disband it. The fact of the matter is that many of our members have not a proper pride in their Association, and do not realize what a great national institution it is. In the last war it rendered a service which was unique and which no other body, Government or otherwise, could have rendered, when it successfully undertook to provide all the doctors needed by the Services with due regard for civilian needs. This was handsomely recognized by the Government, not only at the time, but in the present emergency when it gladly accepted the Association as its agent in a similar capacity.

The Commission has undertaken a most honourable and onerous duty, and I hope we shall encourage it in every way we can. When it has finished its labours it will be for the Government to decide how far its report can be used as a basis for action. At any rate we shall have done our best, and I prophesy that we shall be as proud of having done this duty to the best of our ability as we rightly are of our share in the conduct of the medical side of this war and the last.—I am, etc.,

Henley-on-Thames, March 2. ALFRED COX.

SIR,—I have great respect for Dr. Pooler's opinion, but he has misunderstood me. Writing of the Commission I used the phrase "judge and jury" in the colloquial sense, meaning a composite body, in this case not conducting a trial, but making an inquiry, calling witnesses, taking their evidence, weighing it, and issuing a report as to what will be the best and most suitable form of medical service for the State.

This report to be effective must be authoritative and well balanced, and those on whose behalf the inquiry is being made—that is, the people—will look on it as being prejudiced if any one section of the medical services of the country was predominant in the Commission. It must propound a service that will be of intimate import to every member of the community: a service to keep them in health, to cure them if ill. General practitioners have a great responsibility in preparing their evidence and ample opportunity to present it.

If the report is, before publication, circulated to the Divisions for their consideration the great majority of those discussing it would be general practitioners and they would have an opportunity seldom granted to witnesses in such a case.—I am, etc.,

Westbury, Wilts, March 9. CHARLES E. S. FLEMMING.

SIR,—The letter of Lieut.-Colonel C. J. Stocker in your issue of February 22 (p. 296) merits the careful consideration of every member of the medical profession and more especially of the members of the B.M.A.

To me, as to him and to many other doctors, the proposal of the B.M.A. to set up a Commission to settle our future has come as a shock; and the composition of the Commission gave me a still greater shock, composed for the most part, as it is, of what Colonel Stocker aptly calls "the usual medical oligarchs," with an entirely inadequate representation of the general practitioner and practically no representation of the rural general practitioner.

As a member of the B.M.A. of over forty years' standing, a member of the representative body for several years, and a member of Council, I have some right to speak for the general practitioner in Northern Ireland, and I believe that the present policy of the Association, if persisted in, will disrupt the profession and the Association. From my own knowledge I can confirm Colonel Stocker's statement that "there is a growing opposition to B.M.A. methods both within the fold and outside it." Whilst I hold my own very definite opinion as to necessary reforms in the methods and constitution of the Association if it is adequately to represent the views and protect the interests of the largely inarticulate majority of the profession, I fully agree with him that "it is high time that an 'official' opposition should be organized."

The Medical Planning Commission, formed as it was in a hole-and-corner manner, has not the confidence of the bulk of the profession who had no say in the choice of its personnel, and it should be dropped if worse is not to befall.—I am, etc.,

Belfast, Feb. 25. W. LYLE.

Value of Raw Greenstuff

SIR,—Writing on the second day of March, I am reminded of the passing of February, "the month of fevers," with all its menace. It is the month of fevers because it is so long since the spring flush of grass in the previous year gave health and vigour to the animals, and to mankind that consumed their products. By February the protective store is well-nigh exhausted.

At this time when the supplies of food are altered and in some ways lessened there is need to give attention to the use, now in this springtime of all others, of fresh green leaves which a man may himself use—to wit, such as dandelion leaves, watercress, mustard and cress, chives, chervil, chicory, fennel, celery, celeriac. Eggs from hens upon grass are in short supply. Milk for adults may be less plentiful as pasture lands are ploughed. Fresh liver and kidney and many other indirect sources of the protective qualities of food are hard to come by—the more therefore the need to take them direct from their source. The animals do: "These wait all upon Thee that Thou mayest give them their meat in due season." Now is the due season, and, to put it simply, a far wider use of raw greenstuff—say, a leaf or two eaten with each piece of bread and butter—will make next February less a month of fevers than usual, despite Herr Hitler and all his works.

Oranges are in short supply and often have lost much vitamin C in storage. A swede or turnip, in which a hollow the size of an egg is made and filled with honey or brown sugar, will yield a juice not only full of "C" but very acceptable to little children.—I am, etc.,

Holmes Chapel, March 2. LIONEL JAS. PICTON.

Calcium Requirements and Fortified Bread

SIR,—With reference to the Government's decision to fortify bread with calcium it is stated in your leader of February 22 (p. 281) that "the amount and the nature of the calcium salt to be added to bread are still not settled." In your leader of July 27, 1940, it was suggested, however, that the proposed addition would, on the average consumption of bread, amount to 200 mg. of calcium daily. If amounts of this order are under consideration, and it is accepted that calcium as carbonate is utilizable, the intake of calcium from water supplies appears worthy of notice.

In normal times, when a generous dietary including dairy products and vegetables afforded an ample supply of calcium in suitable combinations, it seemed that drinking-water was an unimportant source of calcium. In the light of the opinions expressed in recent articles on calcium requirements this view may, however, now merit reconsideration. The calcium content of water supplies varies widely. It is practically *nil* in areas where the water is derived from upland sources (mostly

in Scotland, Wales, and the North of England), but in other areas (mostly in England) it exceeds 400 mg., and may even be 800 mg., per gallon. Thus Loch Katrine water contains no more than 7 mg. of calcium per gallon, and the average of upland waters is of the order of 40 mg. per gallon. On the other hand, the average calcium content of hard waters derived from the chalk is approximately 450 mg. per gallon and the greater part of the calcium is present as bicarbonate. Assuming the average daily consumption of water in one way or another is three-quarters of a gallon, over 300 mg. of calcium will thus be regularly supplied in most hard-water areas. This is not an insignificant proportion of the estimated daily requirement, and it exceeds the amount (200 mg.) mentioned above as the proposed addition to bread. In such hard-water areas softening—that is, partial removal of calcium—is practised at a few waterworks, sometimes under statutory obligation, and many households are equipped with domestic water softeners.

In view of these various considerations it is suggested that calcium addition to bread might be unnecessary or less important in hard-water areas than in those supplied from upland sources. Also, the advisability, from the dietetic standpoint of removing calcium from drinking-water by softening processes may be questionable at the present time.—I am, etc.,

London, March 4. E. V. SUCKLING.

Calcium Requirement

SIR,—There are some points in the discussions on calcium requirements in the *Journal* of February 22 which merit close consideration. In dealing with the first of these I employ figures quoted by Prof. Cathcart in his Oliver-Sharpey Lectures (*Lancet*, March, 1940, pp. 533 and 586), in which, it may be said in passing, will be found also pertinent criticism of calcium standard formulation, including the remark that "our knowledge of calcium needs is strikingly elementary." Sherman laid down a standard requirement for calcium on the basis of ninety-seven experiments collected from the literature, and found the mean value of the average intake to be 0.45 gramme. In these ninety-seven experiments the level at which equilibrium was obtained varied in individual subjects from 0.27 gramme to 0.82 gramme a day. Leitch, from her statistical study of calcium balance experiments in the literature, concluded that the daily calcium requirement for an adult is reached with an intake of 0.55 gramme; but that positive balances occurred with an intake as low as 0.15 gramme and negative balances with intakes as high as 0.7 gramme.

I do not enter upon a discussion of the significance of the fewness of the cases employed as the basis of computation of these standards and of the lack of evidence that such cases are a true sample of the adult population or of the warrantability of the addition of as much as 50%, to the standard as a "safety factor." I confine myself to a consideration of the possible meaning of the groups of extreme cases at either end of the frequency curve. Is it not a reasonable interpretation of their existence to suggest that they are significant of something very abnormal either in the observational methods employed or in the physiology and metabolism of the subjects observed? It seems, indeed, probable that while a close and detailed study of these might reveal new and unexpected factors influencing metabolism, their inclusion in an "average" or "mean" must detract from any value such a conception may be supposed to possess in the present circumstances. Would it not be more logical in such cases to employ the "mode"—that is, the most frequently obtained result in the series—as the standard of calcium requirement, on the analogy of majority rule in political and other spheres?

As regards a second point, if the standards of calcium requirement proposed are inaccurate, as undoubtedly they are, the figures based on them, alleging to show the amount of calcium deficiency in the community, must be even more fallacious. Again, the amount of calcium and other dietary constituents present in vegetable foodstuffs (as Prof. Cathcart points out) varies with the season, type of fertilizer used, type of soil, parts utilized, locality where grown, variety of plant, and the like within quite wide limits. What guarantee is there therefore that, in dietary surveys, the amount of calcium allocated to an individual diet from a table of analysis from a relatively small series of food materials collected most often from a limited area corresponds with the true state of affairs?

Finally, much, indeed it would seem all, importance is attached to the quantity of calcium in a diet. But calcium, as the sulphate or silicate, though appearing quantitatively as such in a chemical analysis, would not be the metabolic equivalent of the same amount of calcium in the form in which it occurs in homologous milk. These are extreme instances, but calcium, as a supplement, is often supplied as compounds of an intermediate character, and especially as the carbonate. In this context it may be recalled that the routine method of producing rickets in experimental animals is by means of a diet rich in calcium carbonate, a procedure which inactivates the phosphate of the diet. The addition of calcium carbonate, in less but still considerable quantity, produces, paradoxically, a deficiency of available calcium and thus brings about osteoporosis. Calcium salts of the strong acids, such as the chloride, produce acidosis and osteoporosis. The effect of quality, therefore, of calcium in a diet, and especially in dietary supplements, by its influence on availability, actually exceeds in its importance on metabolism that exerted by quantity.—I am, etc.,

Aberdeen, March 1. J. P. MCGOWAN.

SIR,—Much correspondence has recently appeared in these columns as the result of a recent paper in which my name appeared as a part author, and I should like to make use of a little space which might help to clarify the position.

It will be understood that I can only write of the experiments in which I participated some four years ago on patients who were admitted to hospital and kept in bed during the period of the experiment. In part due to this, constipation did occur, and is thus a contributory cause of the shift of Ca from excretion in the faeces to urine—a very unusual feature. This shift might also be aided by the difficulty of varying the dietary Ca and at the same time keeping protein, fat, carbohydrate, and other factors constant. I achieved this by use of calcium saccharate, which was thought to be of high Ca availability—a fact borne out by the results, the saccharic acid radical probably being metabolized.

The main aim of the work, as I understood it at the time, was to ascertain the effect of Ca and other variables upon hypertension rather than optimal Ca requirement for healthy people.

From the results published it would appear that Sherman's minimal requirement of 0.45 gramme a day is confirmed, and since the patients were recumbent they would thus have a basal metabolic rate of 0.6 to 0.8 of that of an ambulant person; thus the Ca needs of the latter would be about 0.5 to 0.75 gramme a day, taking metabolic rate into account. Due to the immobilization of Ca by phytic acid, the actual intake would probably need to be more than this, being still higher in pregnancy and lactation.

It is possible that the same conditions may apply to the results obtained since I left Liverpool in 1938; I cannot say, but I do know that at that time the hospital was not equipped for animal work, although it was a future development.—I am, etc.,

G. V. JAMES, M.Sc., Ph.D.,
Welwyn Garden City, March 6. Major, R.A.M.C.

Royal College of Surgeons Council Elections

SIR,—I have recently received a communication from the Secretary of the Royal College of Surgeons of England in which personal canvassing by candidates for a place on the Council is strongly deprecated. Surely the Fellows of the College have sufficient intelligence and judgment to decide on their own response to a personal canvass without any such official pronouncement. Individual voters have in the past expressed in the columns of the medical press their distaste for the personal canvass. The public proclamation of these hypersensitive protestants savours of exhibitionism, or at least a desire that the world shall know the exquisite quality of their virtue. Besides, there is always the waste-paper basket.

Should the Olympic frown of the Council prove effective in suppressing the personal appeal of frank canvassing (an appeal which is a feature of all political appointments, and regarded as embodying the essential principles of democracy),

what measures are contemplated to deal drastically with privileged bodies like the teaching hospitals, especially those what cater for Fellowship candidates by special courses? Not to be overlooked is that powerful caucus, the Surgical Club, who exercise their collective power to influence electors as effectively as do other "clubs"—Buffaloes, Rechabites, *et hoc genus omne*. At the first warning of an impending election these organizations go into secret session and agree on a mass attack in favour of their chosen one. Against the momentum of these exclusive bodies, what weapon shall the candidate use whose origin is lost in the obscurity of some small or even large non-teaching hospital? His reputation may be international, his pioneer work universally appreciated; to him there remains only the personal canvass of the more liberal-minded Fellows, who also have a right to representation on the Council.

Let all canvassing be abolished, or leave the field open in harmony with the basic principles of democracy.—I am, etc.,

London, W.1, March 6. H. H. GREENWOOD, F.R.C.S.

The Services

Colonel (Temporary Brigadier) J. A. Manifold, D.S.O., late R.A.M.C., has been appointed a Deputy Director of Medical Services and has been granted the acting rank of Major-General.

Universities and Colleges

UNIVERSITY OF OXFORD

The Dr. John Radcliffe Prizes have been awarded to J. M. Walker, G. A. Neligan, and M. Weatherall.

UNIVERSITY OF CAMBRIDGE

The Raymond Horton-Smith Prize for 1939–40 for the best M.D. thesis during the academical year has been awarded to O. A. Trowell, M.A., M.D., St. John's College; *proxime accessit*, G. I. Watson, M.A., M.D., Corpus Christi College.

The following have been examined and approved for the degree of M.Chir.: G. Blackburn, R. C. F. Catterall, J. S. Ellis, C. G. Rob.

UNIVERSITY OF LONDON

J. H. Gray, M.D., B.S.Adelaide, has been appointed from May 1, 1941, to the University Chair of Anatomy tenable at St. Mary's Hospital Medical School. Since 1937 he has been senior demonstrator in anatomy at University College.

The title of Professor of Dental Surgery has been conferred on E. C. Sprawson, *M.C.*, D.Sc., M.R.C.S., L.D.S. R.C.S., in respect of his post held at the London Hospital Medical College.

A Board of Studies in Pathology has been instituted within the purview of the Faculty of Medicine.

The degree of D.Sc. has been conferred on P. A. I. Gorer, an internal student, of Guy's Hospital Medical School; D. W. W Henderson, an internal student, of the Lister Institute of Preventive Medicine; and R. W. Haines, an internal student of St. Thomas's Hospital Medical School.

The following awards have been made: Chester Beatty Scholarship, T. A. Watson, M.B., Ch.B.; William Julius Mickle Fellowship, C. K. Hallpike, M.B., B.S., M.R.C.P., F.R.C.S

WESTMINSTER HOSPITAL MEDICAL SCHOOL

On May 8 and 9 there will be held an entrance scholarship examination upon the result of which there are offered for award four scholarships each to the value of £75. The examination consists of papers in chemistry and physics, and English essay; the closing date is April 23. Further particulars can be obtained from the Secretary, Westminster Hospital Medical School, 17, Horseferry Road, S.W.1.

Obituary

THE LATE PROF. WILLIAM BULLOCH

W. E. H. writes from Horncastle: Prof. Turnbull in his excellent tribute to the late Prof. William Bulloch shows convincingly Bulloch's profound knowledge of bacteriology and pathology. May I, who, like Bulloch, sat under that inspiring teacher of pathology—D. J. Hamilton, Regius Professor of Pathology in the University of Aberdeen—add a personal note? As Prof. Turnbull so justly writes: "Bulloch had a great sense of humour, was an inimitable raconteur, and inherently sociable." At the B.M.A. Annual Meeting at Oxford in 1904 the Pathology Section under Ainley Walker was a very strong attraction, for the main theme was immunity, and eminent authorities, such as Wright and Noguchi, were taking part. In the evenings Bulloch was the attraction as his friends gathered round him to hear his brilliant talk, so pithy and to the point. At the opening session on immunity Wright led off with: "It is an infirmity of the human mind that it demands an explanation before it has assorted the facts." He next proceeded to write on the blackboard the then mystic word "opsonin." He was followed by Bulloch, whose opening sentence was also an arresting one. "The task allotted to me," he said, "is to state what is fact and what is fancy in our researches into immunity. We have reached the stage when we marshal our facts and court-martial our fictions." The whole discussion was on a high plane, and Bulloch that day shone among the Olympians.

News has been received of the death of Dr. HANS WILDBOLZ, professor of urological diagnosis at the Berne medical faculty, and chief of the Insel Hospital at Berne, aged 68. He had been an honorary member of the Section of Urology of the Royal Society of Medicine since 1928. His name has been given to a reaction in tuberculosis following intracutaneous injection of the patient's urine or blood.

At the memorial service for Sir Frederick Banting in St. Martin-in-the-Fields on March 5 the Council of the British Medical Association was represented by Mr. W. McAdam Eccles, consulting surgeon to St. Bartholomew's Hospital.

Medical Notes in Parliament

Rockefeller Clinical Studentships in America

Prof. A. V. HILL asked on March 6 whether the Minister of Health knew that an offer had been received from the Rockefeller Foundation in New York to undertake and provide for the clinical training and maintenance of selected British medical students in a number of medical schools in the United States of America and Canada. He asked if Mr. Brown would arrange for all facilities and encouragement to be given for carrying out the scheme. Mr. ERNEST BROWN said he was aware of the offer and desired to express his very sincere appreciation of this sign of practical help and sympathy on the part of the Foundation and of the medical schools in America. He would certainly do all he could to further this scheme. A committee had been set up in this country under the chairmanship of the vice-chancellor of Manchester University to select the students. The first group would leave for America as soon as possible. The General Medical Council, the licensing bodies, and the universities were all in agreement on the advantages of the scheme. He was sure that when the students returned to this country their experience would be of great value, and he hoped that this plan might further strengthen the close co-operation in medicine and public health between Great Britain, the United States, and Canada.

Sir FRANCIS FREMANTLE asked whether Mr. Brown recognized that some of the best students would be reluctant to

leave this country and go to a safer country during the war. In Sir Francis's opinion it was necessary that they should avail themselves of this opportunity. He asked Mr. Brown to encourage them to avail themselves of it as a patriotic duty. Mr. BROWN said the Government understood that these young men would have such feelings. They could be assured that by going and continuing their training in America they would undertake the best form of national service.

Family Allowances

The BISHOP OF WINCHESTER, in the House of Lords on March 5, moved a motion advocating family allowances to prevent the increased cost of living from injuring families with dependent children. He recalled that he raised this subject in 1938, when the Government found itself unable to appoint a committee on it. He now said that children had to bear the heaviest burden of poverty, which was largely confined to families in which there were three or more children and in which the wage-earner was poorly paid. This had been accentuated lately by war conditions. If these children were neglected they would grow up anaemic, unhealthy citizens. If a man was in work he had no family allowance, but if he was out of work the Public Assistance Board made an allowance for the children he had.

Viscount SAMUEL said the case presented was overwhelming. An immense number of the children of the country had too little food or food of bad quality. Their health and strength were impaired. In this country 1,250,000 children belonged to families where there were four, five, or six children. Nemesis was now upon the country because, owing to the strain on families combined with the invention of means of birth control, there had been a catastrophic fall in the birth rate. The House would remember a cogent speech made on that subject by Lord Dawson of Penn during a debate in June, 1939. The Metropolitan Police and some of the most enlightened industrial firms had introduced family allowances, in each case with complete success. Lord STAMP suggested that wage increases based on the cost of living should be measured by reference to an average family of two children and recognition of the needs of additional children.

Lord MOYNE said that a year or two ago the report of the Unemployment Insurance Statutory Committee showed that when weekly payment was based on a subsistence level, the wage level earned for large families had been dangerously depressed below the absolute necessities of life. Family allowances were only one method of dealing with this intricate problem. It would be out of the question to ask the Chancellor of the Exchequer to assume the burden of family allowances at the present time. There was much to be said for the view that Parliament should begin by methods of direct assistance such as the provision of pure milk, which could not fail to go to the benefit of the children. One-fifth of the milk drunk in this country was now going through the channel of the milk scheme. He found no hostility shown by the Chancellor of the Exchequer to the idea of family allowances as part of post-war reconstruction if an acceptable scheme could be worked out. But the Chancellor made it clear that he could not afford the present system of subsidizing the necessities of life and at the same time provide for family allowances. Mr. Greenwood, who was charged with planning the post-war system, was giving consideration to the question.

Diphtheria Immunization in Scotland

On March 4 Mr. LEACH inquired why the subcommittee which recently reported on the practical application of diphtheria immunization in Scotland, and ascertained the number of children immunized in Edinburgh and other particulars concerning diphtheria immunization in that city, did not also obtain details, known to be available in the medical officer's office, of the number of cases of diphtheria and deaths from that disease in immunized and non-immunized children. Mr. JOHNSTON replied that in Edinburgh much of the diphtheria immunization had been done by general practitioners. Accurate information whether individual children were or were not immunized was not available either to the Public Health Department or to hospitals where cases of diphtheria were treated. Such particulars as were available were approximate only, and were, therefore, not regarded by the Scientific Advisory Committee as appropriate for inclusion in their report.

Advancing the Clock

Mr HERBERT MORRISON said on March 4 that the addition during the summer months of an extra hour's daylight in the evening would be advantageous to the war effort in many ways. In many factories it would enable two shifts to be worked in daylight. The conclusion of the Government was that, provided the period during which the changed time operated was limited to mitigate the agricultural disadvantages, the scheme ought to be adopted. He accordingly proposed to make a Defence Regulation advancing the clock by another hour from the night of Saturday, May 3, to the night of Saturday, August 9. The House of Commons would have an opportunity to debate this Regulation.

Distribution of Medical Man-power

Mr BROWN told Mr. Mander on March 6 that recommendations would shortly be published from the committee presided over by Sir Arthur Robinson to consider the steps necessary to secure a proper allocation of the available medical manpower between civilian and medical services. Mr. Brown added that in conjunction with the other Ministers concerned he was taking action on the recommendations. The committee sat for seven days and heard seventeen witnesses, of whom twelve were medical. As the inquiry was urgent and confidential the committee only called for such evidence from Government Departments and public bodies as it required to supplement the considerable knowledge of the subject possessed by its members. He would be glad to seek further competent advice if the recommendations proved that to be necessary. The committee's deliberations were confidential.

Sir LEONARD LYLE inquired on March 5 if Mr. Brown was aware of the shortage of doctors in many rural districts, especially when these were overcrowded with evacuees of all sorts. He asked what steps were taken to ensure that the younger doctors were not called up before the real need began for the use of their services by the Army. Miss HORSBRUGH replied that Mr. Brown was aware of the shortage of doctors in some rural areas and appreciated the difficulties. The measures which he was taking in conjunction with the Service Ministers and the Secretary of State for Scotland on the recommendation of Sir Arthur Robinson's committee were designed to reduce to a minimum the number of doctors to be called up from private practice. In selecting the individual doctors for commission the Central Medical War Committee and its local committees gave full weight to the special needs of the reception areas. A definite scheme was to be arranged to ration doctors both for the civilian population and the Army. The matter was being gone into and the doctors who might have been called up were remaining in their civilian practices. Answering Sir Francis Fremantle, Miss Horsbrugh said she could not give the date when the priority committee would get to work.

Casualty Services: Cardiff's Example

Dr. MORGAN asked on March 6 whether the attention of Mr. Brown had been called to the arrangements in Cardiff, in which every general practitioner had been provided with adequate equipment for dealing with air-raid casualties at the site of incidents, and had been informed exactly how the air-raid precautions services were organized and the part which he would have to play in them. He asked Mr. Brown to compel the making of similar arrangements in other towns. Mr. BROWN said he had received a report on the arrangements at Cardiff. While he approved them generally he was asking his medical officers to communicate with the responsible local officers on certain aspects of the scheme which required further consideration. His medical officers were constantly in touch with medical officers of health on the most suitable arrangements for utilizing the services of practitioners in the area. These must necessarily vary in detail according to local conditions.

Dr. MORGAN suggested that in many large towns a number of general practitioners had been given no opportunity to

acquaint themselves with the various phases of air-raid precautions work, or with the persons, the aid posts, etc., with which they would be required to co-operate in case of emergency. Mr. BROWN said medical officers of health were asked last year to make plans for reinforcing the hospitals and first-aid posts, in case of emergency, by practitioners not officially attached to those services. They had generally got into touch with the profession in their areas, by calling meetings or otherwise, in order to familiarize them with the services.

Trichiniasis

Dr. MORGAN referred on March 6 to the recent occurrence of cases of trichiniasis in parts of Great Britain and the identification of pork and pork products as their cause. He urged the compulsory heating and cooking of all such products, especially those used in the making of sausages. Mr. BROWN replied that investigations were in progress with regard to these occurrences. By wireless and in the Press it had been pointed out that provided pig meat was thoroughly cooked no risk would be run. He did not think it necessary to order the compulsory heating and cooking of all pig products.

London's Ambulance Service

On March 6 Mr. BARTLETT inquired how many ambulance stations in the London area were fully staffed on the scale laid down at the beginning of the war; and how many resignations and enlistments took place in the last six months. Mr. BROWN said in reply that the establishment of the London auxiliary ambulance service was not laid down in terms of stations, the staff of which could vary according to circumstances. The total staff of the service was somewhat below the authorized strength, but had proved adequate to meet the calls made on it. In the six months September, 1940, to February, 1941, resignations numbered 1,268 whole-time and 357 part-time staff, while enlistments numbered 608 and 275 respectively. Mr. Brown paid tribute to the courage and devotion shown by the ambulance staffs in maintaining this service.

Physiological Problems of Flying

Introducing the Air Estimates on March 11, Sir ARCHIBALD SINCLAIR said special attention was being paid to the problem of cold, to the supply of oxygen at high altitudes, and to night vision. The development of aircraft tended toward flying at great heights, and research was continuous to find a solution to the physiological problems involved. The problem of cold was being tackled by the sealing up—a difficult technical problem in a fighting aircraft—and the heating of cabins, and by provision of equipment, boots, gloves, helmets, and underclothing of special design. The psychological care of pilots was not less important. The early detection of signs of flying strain formed an important part of the duties of medical officers of the Air Force. The fighting spirit of the pilots was so strong that unless they were closely watched they kept on flying long after they should have been rested from operations. The doctor's duty was to catch them in time so that the squadron or station commander could make them rest. Good results had been achieved. The incidence of flying strain had been considerably lower than was expected before the war. The Ministry's four orthopaedic centres were second to none in the country to-day. Behind them were rehabilitation centres situated in the healthiest parts of the country, at which the most up-to-date methods were applied to secure recovery as quickly as possible. In addition, centres with the most modern forms of treatment for severe burns had been established.

Doctors' Duties in Invasion

Mr. GROVES inquired on March 11 whether any comprehensive scheme had been formulated and notified to all civilian members of the medical profession whereby their services were available and their precise duties known in case of emergency, whether due to air raids or invasion. Mr. BROWN answered that it was obviously impossible to assign precise duties in advance to every civilian doctor. The plans for reinforcing the hospital and first-aid post services in the event of military operations in this country were, as announced in the medical press last month, being worked out in conjunction with the appropriate R.A.M.C. officers and also, in order to secure consultation with practical medical bodies, with the secretaries of Local Medical War Committees. He had every reason to believe that this procedure would produce satisfactory and efficient schemes.

Shelter Conditions in Provinces.—Miss HORSBRUGH stated on March 11 that the attention of Mr. Ernest Brown had been called to Lord Horder's report on March 4 about children living in public shelters in the Provinces. Mr. Brown had recently inspected some of the shelters Lord Horder had in mind, and had under active consideration proposals for dealing with the matter.

Notes in Brief

Of the 42,319 claims for injury allowances up to February 1, 1941, from civil defence volunteers and other civilians, 3,438 were rejected, and of the 5,483 claims for pension 615 were rejected.

Medical News

The next meeting of the Association of Industrial Medical Officers will be held on Saturday, March 22, at 3 p.m., at the Engineers' Club, Manchester. The public business will begin at 3.45 p.m., the subject for discussion being "Toxic Substances in Industry," opened by Dr. S. A. Henry. Dr. M. W. Goldblatt will discuss the hazards of the chemical industry, Dr. A. J. Amor those of the welding industry, and Dr. A. L. Leigh Silver various health problems in filling factories. The discussion will be followed by a dinner at the Engineers' Club at 6.15 p.m.

Because of the frequency with which hospitals are bombed from the air, a fleet of twenty-five mobile *x*-ray plants, each capable of the most urgent work of a hospital radiographic department, is being built by the War Organization of the British Red Cross. Generally speaking, these units are built to the Society's design—a design which has stood the test of experience over a long period of time. They will be posted, in collaboration with the Ministry of Health, throughout the country, in districts where the Ministry thinks they will serve a useful purpose. All the usual accessories are housed in the vans, and the units are self-contained, being built to generate their own power.

The board of management and the medical staff of the Hospital for Sick Children, Great Ormond Street, are anxious to offer medical men and women from over-seas the opportunity of visiting the hospital during their stay in this country. The hospital block, the second section of the rebuilding scheme, was completed just before the war, and contains many interesting features in design and equipment, the product of the experience of the medical, nursing, and lay staff during the past quarter of a century. Doctors and nurses now in England, particularly those interested in the treatment and care of sick children, will be welcomed.

The Bombay Medical Council at a meeting last September resolved that "in the absence of a common Indian language medical education of the Western type should for the time being be imparted through English as is done at present." Reference was made to the impending retirement of General Buckley, who has been President of the Council for nearly four years, and a unanimous resolution was passed expressing appreciation of the valuable services he has rendered to the profession, and particularly to the Council, during that period.

The Royal Northern Hospital, Holloway, has received, through Mrs. Wales Latham of New York and Mrs. Edward Murrow of London, 30,000 dollars for six months' maintenance of the operating theatres and *x*-ray department. The gift has been received with this message: "Delighted that 'Bundles for Britain' and its 800 branches can share in your courageous work through the sympathy and generosity of the American people."

The New South Wales Health Department proposes to appoint at least 10,000 residents, both male and female, between the ages of 18 and 60, to participate in a blood transfusion scheme to provide a twenty-four-hour service of blood donors to hospitals and a supply of blood for transfusions in any emergency.

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics of the British Isles during the week ended February 15, 1941.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included); (b) London (administrative county); (c) Scotland; (d) Eire; (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each heading of disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	(b)	(c)	(d)	(e)	1940 (corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	378	26	81	2	—	560	25	114	1	5
Deaths		7	7				4	10		
Diphtheria	1,175	50	343	18	32	655	25	200	55	34
Deaths	46	1	13	2	1	20	1	11	1	1
Dysentery	174	11	30		—	61	2	25		—
Deaths			—		—			—	—	—
Encephalitis lethargica, acute	6	1	—		—	14	—	1		
Deaths		—	—				—	—		
Enteric (typhoid and paratyphoid) fever	18	2	1	4	1	13	2	2	5	4
Deaths	2	—	1	—	—	3	—	—	—	1
Erysipelas			65	4	2			45	5	5
Deaths		—	—	—	—		—	—	—	—
Infective enteritis or diarrhœa under 2 years	—	—	—	—	—	—	—	—	—	—
Deaths	36	1	5	1	3	43	6	10	4	6
Measles	16,654	387	177	—	18	5,055	46	55	—	316
Deaths	26	5	3	—	—	14	—	2	—	14
Ophthalmia neonatorum	62	3	20		1	72	10	18		—
Deaths					—					
Pneumonia, influenzal	2,106*	162	46	9	18	2,074	100	139	9	13
Deaths (from influenza)	324	50	24	4	5	521	47	86	11	15
Pneumonia, primary			411	15				492	15	
Deaths		130		19	18		96		23	40
Polio-encephalitis, acute	2	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	12	1	—		—	4	—	3		—
Deaths	—	—	—				—	—		
Puerperal fever	1	1	6	—	2	2	2	6	3	1
Deaths		—					1			
Puerperal pyrexia	199	10	14		1	151	15	27		—
Deaths										
Relapsing fever	—	—			2	—	—			—
Deaths										
Scarlet fever	1,198	63	164	60	28	1,019	44	113	56	61
Deaths	3	—	1	—	—	6	—	1	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	3,425	39	495		21	509	12	56		15
Deaths	35	3	17	1	—	5	—	1	—	2
Deaths (0-1 year)	469	36	86	37	24	578	73	115	52	32
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	7,734	1,350	912	243	208	8,807	1,299	1,186	295	314
Annual death rate (per 1,000 persons living)			19.9	16.1	18.2			22.7	19.9	27.6
Live births	5,416	386	899	318	226	6,226	895	917	279	247
Annual rate per 1,000 persons living			18.2	21.1	19.8			18.6	18.6	21.7
Stillbirths	213	21	42			256	31	35		
Rate per 1,000 total births (including stillborn)			45					37		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

Measles, whooping-cough, diphtheria, pneumonia, cerebrospinal fever, and dysentery have increased in incidence during the week. In Scotland notifications remained at approximately the same level, with the exception of whooping-cough, which showed an appreciable increase although deaths were fewer.

Cerebrospinal Fever

Cerebrospinal fever has appeared in fewer localities than last year—approximately two-thirds of the administrative health areas as against nearly five-sixths in the corresponding week of last year. Except for the highly industrialized centres of Lancashire and the West Riding of Yorkshire, local prevalences have nowhere reached the dignity of epidemics. The chief centres of the disease at present are Lancashire 57; West Riding of Yorkshire 28; London 26; Middlesex and Warwick 17 each; Chester 16; Glamorgan 15; Durham, Essex, and Surrey 14 each; Southampton 13; Stafford 11; Devon 10. Notifications for the week ending March 1 numbered 460. In Scotland just under one-half of the counties and burghs are affected, notably the counties of Dumfries 4; Ayr, Fife, and Lanark 3 each; and the burghs of Glasgow 25, Edinburgh 12, Ayr and Rutherglen 3 each.

Dysentery

Although the incidence of dysentery has been mounting in recent weeks it remains a comparatively infrequent disease, and at present has appeared in only fifteen of the administrative areas, three of which account for over three-fifths of the total, while only single cases were recorded in no more than a third of the areas. It is probable that the notified cases are an underestimate of the real incidence of the disease, as single cases of the prevailing mild Sonne type are readily overlooked. The areas chiefly affected were Lancaster 49, Essex 28, Bedford 27, London 11, Northampton 10, Kent 6. In Scotland the notifications were: Fife 3, Argyll 2, Dumbarton and Stirling 1 each, and in the burghs of Edinburgh 9, Aberdeen 5, Dundee and Glasgow 4 each, Paisley 1.

Influenza for Week Ending March 1

In the week ended March 1 267 deaths were ascribed to influenza in the great towns, 47 fewer than in the previous week. The age distribution continues to be normal: 5.7% only of the deaths were at ages under 25 and 55.8% at ages

Total of Influenza Deaths and Deaths in Age Groups in 126 Great Towns for Week Ending March 1

All Ages	A Under 1 year	B 1-5	C 5-15	D 15-25	E 25-35	F 35-45	G 45-55	H 55-65	I 65-75	J 75 and over
267	8	—	2	11	6	14	34	43	70	79

Regional Totals of Influenza Deaths for Week Ending March 1

South-Eastern Area:			Midland Area	54
Greater London	79		Eastern Area	5
Rest of S.E.	16	= 95	South-Western Area	7
Northern Area		102	Wales and Monmouthshire	14

Total for 126 Great Towns, including the Outer Ring 265

over 65. In the County of London the deaths have decreased from 26 to 20. The proportion of total deaths coming from the South-Eastern Area remains almost the same as last week—35.5%. This is the second week of decline in total mortality, and it is now improbable that this winter's experience will be as bad as that of 1940, when the epidemic was not very severe.

As the appeal of the Spanish Government for general vaccination has had little effect, the following method has been employed. Food cards will in future only be given on presentation of a vaccination certificate, and a vaccination department will be established close to the office for distribution of food cards where vaccination can be performed gratuitously.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

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B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Wild Plants as Sources of Vitamin C

Dr. W. J. BURNS SELKIRK (Birmingham) asks whether there is any objection to recommending the young leaves of the hawthorn for eating in place of fresh vegetables this year. He writes: Nasturtium leaves, I believe, can be eaten freely "as salad" component. It would also be interesting if you could publish from some Finnish source the recipe for making a conserve of wild rose hips, which, I understand, the Finns make and use through the winter, the hips being very rich in vitamin C. What book would you recommend dealing with the use of wild herbs? No doubt past generations of country folk were in the habit of using various herbs in the spring after winter deprivation of sources of vitamin C. The field dandelion, as used in salads by the French peasants, is one at least.

Coley's Fluid

Dr. W. R. STEPHEN (Lodge, near Wrexham) writes: Can Coley's fluid be used while the patient is still at work or in such a manner that he is off work as little as possible? I should be grateful for any advice.

Intestinal Flatulence in the Aged

"R. S." writes: I should be grateful for suggestions about the treatment of a case of intestinal flatulence, distressing to the patient. Liquid paraffin and pil. alophen have been prescribed to regulate the bowels, and carminatives have been administered. The patient is 78 years of age and of active habits.

Dysmenorrhoea

Mr. A. J. HOBSON, F.R.C.S. (Wimbledon, S.W.20), writes: I would like to reply to Dr. D. C. Miln (February 22, p. 304) under the headings he suggests. (1) The mixture should be commenced about a week before the period is expected and continued through the period itself. (2) I have to confess that the cases in which I have tried out this mixture have been chiefly among my friends and relatives, people whose intake of vitamin D is probably adequate. In these cases I have been extremely satisfied with the success of the prescription. In my hospital work, dealing with patients of a less sufficient dietary level and chiefly cases of delayed bony union, I give vitamin D and rely on injections of calcium Sandoz. (3) The rapid benefit I have obtained in cases of really bad chilblains would appear to show a very definite effect on vascular permeability. As to expense, I have no experience at all with national health insurance practice, but as I have yet to find calcium tablets of any use, I think that if more extended use of the mixture I put forward proves its value then a good case could be made out for its employment. Finally, I have always wondered why some young biochemist does not fully investigate calcium balance—intake and excretion—under different diets and treatments.

Dr. GEORGE HALL (Montreal) writes: When gynaecological findings were negative I have used the following recipe over a period of twenty-five years with very pleasing results—namely, saturated solution of pot. iodid. in aqua chlorof., mv, t.i.d., p.c., for two or three months. Tribute is paid to this treatment in his book *The Horse and Buggy Doctor*, by Dr. Arthur E. Hertzler, published by Harper Bros., London and New York. I am of the opinion that the majority of cases are psychological, but pot. iodid. will do the trick.

Treatment of Herpes

Dr. RANDAL A. STEWART (Hampstead, N.W.3) writes: With regard to the treatment of herpes, I have found the old A.C.M. lotion, when swabbed over the lesions three to four times daily, to be particularly effective in drying up the lesion and also in preventing a secondary impetigo. The formula is:

℞	Acetone	ʒij
	Cyllin	mxlviij
	Sp. vin. meth.	ad ʒv

The only disadvantage is that the application is rather painful when applied over large areas. It is very valuable in herpes labialis. The lotion is an excellent one in the preparation of the skin for surgical operations. The acetone has the effect of dissolving grease, thus allowing the disinfectant to act.

LETTERS, NOTES, ETC.

Scabies

Dr. E. A. WELSH (Felton, Morpeth) writes: I was very pleased to see the letter by a practising dermatologist on the subject of scabies. I have seen more of this condition during the past year than in the previous eighteen years I have been in practice. It may not be an infectious disease in the accepted sense, but in the ordinary sense it is the most infectious disease I know. Measles and whooping-cough are now notifiable, and their treatment is easy as compared to scabies. If it continues to increase at its present rate there will soon be few of us not in need of treatment. The impossibility of efficient treatment under adverse conditions and when a whole household has become thoroughly infested is such that some active interest is called for from the public health services.

Green Vegetables

"G. E." writes: As a doctor's wife who reads the *B.M.J.* even more methodically than he himself, may I state that in my opinion your correspondents have not looked at the above question from the woman's point of view. The suggested lower price of vegetables would not popularize them with the poorer members of the community. Even were they to be given away there is so much time and labour involved in cleaning and preparing them that the working-class woman is prejudiced from the start. In homes where a servant is kept there is usually no lack of properly cleaned and cooked green vegetables at meal-times, but the poorer housewife is not paid a wage for this "drudgery." Working-class children would receive ample supplies of these vital foodstuffs were it possible to obtain them in tins, or even packed ready cooked, like fish and chips, in newspapers!

Tourniquet for First Aid

Dr. THOMAS G. OSLER (Watford) writes: I wish to endorse the recent note in your *Journal* (February 15, p. 262) by Captain Farris, R.A.M.C., on a first-aid tourniquet made from strips cut out of discarded motor-car inner tubes, and am interested to note the good results he records. I have recommended for use a similar tourniquet in the Watford Borough A.R.P. casualty services, my pattern being 2 inches broad by 3 feet or 4 feet long, the different lengths being for the upper or the lower limbs respectively. These lengths give the advantage of obtaining obliteration by the pressure of several firmly applied turns as opposed to one or two very tight ones, and this also is an advantage in the gradual loosening of the tourniquet. Two tapes are fastened on to one end and are used for fixing the tourniquet on the limb; a small rubber loop is attached to the other end and serves to hold the tourniquet in a neat rolled-up position ready for immediate use.

Zinc Peroxide for War Wounds

Dr. W. J. BURNS SELKIRK writes with reference to the annotation on this subject (February 2, p. 285): I had a case of cancer of the mouth and pharynx, sloughy, foul, and fetid. The patient refused surgical treatment and I gave him large doses of pot. chlorate. The cancer became clean, lost its fetor, and the patient lost the foul taste from it. Otherwise, of course, the case progressed to a fatal termination.

Corrigendum

Dr. D. FITZGERALD MOORE writes: In my letter (December 14, 1940, p. 848) on nutritional disturbances and optic atrophy the reference to T. Moore in relation to animal experiments and optic atrophy should read L. A. Moore (U.S.A.). I also made the statement that manioc is fairly rich in riboflavin. It is, however, possible that processed manioc such as gari, in common use as a local food, may show a much lessened riboflavin content. It is hoped to get more definite information on this point in due course.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY MARCH 15 1941

SCHEME FOR STATE MEDICAL SERVICE

BY
S. TERRY PYBUS, M.D.

It is now generally agreed that in the near future we shall have some form of State Medical Service: I venture, therefore, to outline very generally my scheme for a complete service. Some may consider it too ambitious, but I contend that, when organizing so important a service and one which must make such great changes in our profession, we should do the job thoroughly at the start, rather than by a series of half-measures and makeshifts. Furthermore, only by bringing all medical services into one complete State organization can we attain the greatest efficiency and economy.

The tendency for some years has been for medical practice to be divided into too many separate departments—specialist, general, and panel practice, public health and preventive medicine with its special clinics, school medical service, and so on—many of them administered by such different bodies as the Ministry of Health, the Home Office, the Board of Education, local authorities, etc., each working in its own small sphere with but little attempt at co-operation. I suggest that under the State service all should be administered by one body working under the Ministry of Health, and that at least 50% of the members of this central administrative body should be medical men. I should include every branch of the profession in the State service—panel and private practitioners, consultants and specialists, public health medical officers, and also dental surgeons and nurses—and would take over all clinics—school, ante-natal, tuberculosis, venereal disease, etc.—hospitals—general, isolation, mental, etc.—as well as homes for old people and incurables. This is a very wide scheme, but it is thorough and would provide a medical service second to none.

To start with, the State service would provide medical attention for everyone with an annual income of £500 or less, men, women, and children, with the exception of members of the Army, Navy, or Air Force, who would be looked after by the Service medical staffs. Persons with an income of over £500 a year would have the choice of being attended under the State service at fees to be detailed later, or by any doctors who refused to serve under the State scheme. In time the latter would disappear, and all would enjoy the privileges of the State service. Sickness benefit would not be included in the scheme, but could be provided separately by a pensions department, which would also deal with old age, widows', and other pensions. Approved societies would cease to have any connexion with the State service or with sickness benefit payable by the pensions department. At the change over, wherever possible, doctors would be allowed to remain in the locality where they had previously practised if they so desired, although, in some areas, some redistribution would be necessary to provide adequate medical attention for the population. So far as possible patients would be given free choice of doctor and hospital.

Regionalization

The country would be divided into regions defined by geographical conditions and density of population. The headquarters of each region would be one of the big general hospitals, which would be the centre for the consultant staff of the region and the teaching hospital for medical students and for postgraduate courses. In addition to the clinical staff there would be the regional administrative staff and the regional public health staff (the latter replacing the present county medical officers of health) with offices in or near the hospital.

The regions would be subdivided into areas, each of which would have one of the smaller general hospitals as its centre and its own clinical, administrative, and public health staffs. On the clinical staff would be a full complement of consultants for every branch of medicine and surgery, who could be called in when required by the medical officers of the clinics in the area. There would also be a relief staff of medical officers for the clinics to take duty during vacations, sick leave, or epidemics. All mental and isolation hospitals, maternity homes, homes for incurables and the aged, sanatoria, etc., would be administered by the area administrative staff, who would also be responsible for the organization of all clinics from which the district staff would work.

The areas would be further subdivided into districts, with a clinic as headquarters of each. These clinics would replace the present surgeries, but, unlike the latter, would be equipped with up-to-date apparatus for diagnosis and treatment. They would take over the work of the present school, venereal disease, and ante-natal clinics, the public dispensaries, etc., as well as of general practice. Each would normally cater for about 20,000 inhabitants and would have a staff of from ten to fifteen medical officers; in some country districts a smaller clinic would be desirable. Attached to each clinic would be a small hospital of twenty to fifty beds for emergencies, cases under observation, maternity cases, and those not serious enough to send into the area hospitals or patients too ill to stand the longer journey. The clinic staffs would be encouraged to specialize in medicine, surgery, obstetrics, pathology, etc., according to their tastes and ability, with a view to promotion to the area and regional hospitals as vacancies occurred. Team work would be encouraged so that the patient would receive the best available treatment, but each case would remain under the care of its original medical officer, thus maintaining continuity of treatment from beginning to end. Each medical officer would attend the clinic at his own stated time daily (as our present surgery hours), but there would always be at least one doctor on duty day and night for emergencies. Night and Sunday duty would be taken in rotation, and every medical officer would have one free day each week at least, five weeks' annual vacation, and two weeks' postgraduate leave each year for study at an area or regional hospital. Where the demands of the district justified it, sub-clinics would be provided, which would be well-equipped surgeries where doctors from the clinic would attend at stated hours daily. The clinic medical officers would work in close collaboration with the clinical and administrative staffs of the area. Dental surgeons would be attached to regional, area, and clinic staffs on terms of service similar to those of the medical men, while district nurses would be included in the personnel of the clinics, replacing the present district nursing associations. These nurses would receive an adequate salary and would be given opportunities for promotion to other posts.

Remuneration and Practice Compensation

All newly qualified doctors on joining the service would spend their first two years as house officers at a regional or area hospital or as junior medical officers at a clinic, with a salary of £250 a year; after this they would be appointed to the regular clinic staff. Promotion on the clinic staffs would be by seniority of service; promotion from clinic to area, and later to regional, staffs would be by seniority and ability, for no medical man would be appointed to area or regional staff until he had obtained a higher or additional qualification in his special branch of work. Those wishing to do so could take duty on the administrative instead of the clinical work. Salaries of clinic medical officers would be £500 a year, rising to £1,250; the area staff would have a minimum salary of £750 a year, or the salary they were receiving when promoted from the clinic staff, rising to a maximum of £1,850 a year. The maximum for the senior man of any department of a regional staff would be £2,500 a year. All would contribute to a superannuation fund and would retire on pension, voluntarily at the age of 60 or compulsorily at the age of 65. In the case of retirement owing to ill-health a pension would be given according to the circumstances of the case.

As regards compensation to doctors for the loss of practices for which they had paid large premiums, I suggest that when a doctor gives over his practice to the State and takes a post in the State service the Government should recompense him for his loss of capital. As he would start in the State service with a salary and position in accordance with the years he had been qualified and his ability and would, in addition, be eligible for a pension, I suggest that he be given one year's purchase, based on the figures for the last three years. In the case of practices purchased through insurance companies or finance corporations, the State Medical Service Act must contain a clause whereby the sum to be repaid on the practice being sold to the State must in no instance be greater than the sum given by the State for the practice. This might hit the companies in a few cases, but it would be only fair; they should bear a small loss for the benefit of the State along with those doctors who had paid cash for their practices. I further suggest that instead of paying out the whole of the purchase price immediately, the State should pay it in bonds maturing in from five to twenty-five years, with interest at the rate of 5% per annum. This would spread the cost over a number of years and relieve the financial strain at the start of the scheme, when there would be other expenses, such as the cost of freeing hospitals from debt, equipping clinics, etc.

Financing the Service

The costs of the service would be borne by the Government, and the money raised by taxation and from the fees paid by certain patients. All persons with an income of £250 a year or less would be attended free of charge, either in clinic or hospital. Those with an income of from £250 to £500 would pay a fee of 3s. 6d. per consultation at a clinic, 5s. a visit, and, when in hospital, £1 a week for each £100 of income, plus a small operation fee. Those with an income of over £500 a year (voluntary members) would pay from 5s. to two guineas for a consultation or visit, a hospital fee of from five to twenty guineas a week, with an operation fee of from two to fifty guineas, according to income. Medicine would be supplied free to all with an annual income of £250 or less; prescriptions would be given as under the National Health Insurance Act, and chemists would be paid by the Ministry of Health. Persons with incomes of from £250 to £500 a year would be given a prescription but would pay the chemist themselves, an exception being made perhaps when exceptionally expensive drugs were essential. Voluntary members would pay for all prescriptions dispensed by the pharmacist.

Medical officers of health have been asked (*Circular 2254*) to supply the Ministry of Health with information concerning those men born in the year 1922 or between the years 1908 and 1919 inclusive who have a history of tuberculosis. The information should be supplied on Form T.147 in accordance with the instructions given in an earlier circular (*Journal*, October 12, 1940, p. 501).

MEDICAL BENEFIT IN NEW ZEALAND

It has recently been announced that Mr. Nordmeyer, who succeeded Mr. Fraser as New Zealand Minister of Health on the appointment of the latter as Prime Minister of the Dominion, has declared March 1 of this year as the appointed day for bringing into effect the general medical practitioner service and the hospital out-patient service provided under the Social Security Act of 1938 and its Amending Act passed in September, 1939. He has also stated that the establishment of a free pharmaceutical service may be expected on April 1 next. These announcements are somewhat surprising, though information reaching this country as to the progress of events in this regard during recent months has not been very definite.

In the *Supplement* of March 23, 1940, we gave an account of the then position of the administration of the health provisions of the Social Security Act, recording with satisfaction the acceptance by the Government of the British Medical Association's proposals in regard to maternity benefit and a watchful attitude on the part of the profession as regards hospital in-patient provision, but stating that the New Zealand Branch of the Association was opposed as strongly as ever to the general practitioner service, mainly, but not exclusively, on the ground of the universality of the proposed clientele. It was expected at that time that negotiations might continue in a friendly atmosphere, but it seemed probable that no attempt would be made to establish this part of medical benefit before the end of the war. These hopes have unfortunately now been disappointed, and the Government has decided to attempt to institute this service at once in spite of the opposition or attitude of non-cooperation of the Association.

Under these conditions, and so far as our information extends, it is difficult to see how any satisfactory general practitioner service can come into being. Hitherto the loyalty of members of the profession to the Association and their confidence in the leaders of the New Zealand Branch have been a very marked feature. For example, in their successful opposition to the original proposals for maternity benefit less than thirty practitioners out of well over 800 were willing to accept contracts. It would seem that the number willing to take part in the new service, even should the proportion be larger than that indicated, must be wholely inadequate. During the controversy that preceded the enactment of 1938 it was stated that in such an event the Government would be prepared to invite American *and German* doctors to settle in the Dominion and to place their names on the *Medical Register*. Circumstances have ruled that out, but it is possible that the New Zealand Ministry of Health has decided in some way to exploit the out-patient departments of hospitals to help out an unfortunate situation and justify a deplorable decision. It is to be hoped that the customary loyalty of the profession to its leaders will enable some reasonable change to be brought about.

Correspondence

Public Health Appointments in Wartime

SIR,—As a candidate who was interviewed for the appointment in the Department of Health for Scotland which was referred to in the letter in the *Supplement* of March 1 (p. 25), I should like to make some comments. There is no doubt that persons serving with the Forces are at a disadvantage in regard to these posts, and everyone would welcome the clarification which your correspondents request. But before this is attempted, it ought to be established as a principle that the disadvantage be shared equally by medical officers in the Forces and civilian medical officers. Many medical officers in public appointments are engaged in civil defence work, and it cannot be suggested that they are serving their country in any lesser capacity than those in the Forces. Personally, I am employed in a "front-line" borough, and although I am registered for military service and should welcome the opportunity to be in the Forces, the local authority has made representations to the Local Emergency Committee for my exemption and these have been accepted.

To make all public appointments temporary would transfer the disadvantage entirely to the civilian medical officers. The posts of most medical officers with the Forces are held open for them for the duration of the war, but if a civilian medical officer leaves a permanent appointment for a temporary one he may find himself unemployed at the end of the war or may be obliged to accept a post inferior to that which he originally held. I hope that these considerations will be borne in mind in any attempt to correct the present injustice to practitioners in the Forces.—I am, etc.,

March 3. DEPUTY M O H.

British Medical Association

Diary of Central Meetings

APRIL

2 Wed. Industrial Health, 2 p.m.

Branch and Division Meetings to be Held

ABERDEEN BRANCH: CITY OF ABERDEEN DIVISION.—At Forresterhill, Aberdeen, Thursday, March 20, 8.30 p.m. Prof. D. Baird, "The Problem of the High Stillbirth and Neonatal Death Rates." Members of the Aberdeen and Kincardine Counties Division are invited to attend.

GLASGOW AND WEST OF SCOTLAND BRANCH.—At 39, Elmbank Crescent, Glasgow, Sunday, March 16, 3 p.m. First of a series of three lectures by Drs. J. Nairn Hay and G. L. Pillans, "Recent Developments in the Diagnosis and Treatment of War Gas Casualties." All practitioners in the area of the Branch are invited to attend.

METROPOLITAN COUNTIES BRANCH: CITY DIVISION.—At B.M.A. House, Tavistock Square, W.C.1, Wednesday, March 19, 2.30 p.m. Papers by Prof. J. C. Drummond, "Nutrition in Time of War"; Prof. Major Greenwood, "Some Epidemiological Problems of the Air War"; Dr. J. C. Spence (Newcastle-upon-Tyne), "Clinical Aspects of Nutrition." All members and doctors in the area of the Branch are invited to attend.

NORTH OF ENGLAND BRANCH.—At Newcastle-upon-Tyne, Thursday, March 20, 2.30 p.m. Prof. E. Farquhar Murray, "Midwifery, Ancient and Modern"; 3.45 p.m., Messrs. H. Harvey Evers, William Hunter, and Stanley Way, Demonstrations. Members of the Services stationed in the area of the Branch are invited to attend.

Meetings of Branches and Divisions

SOUTH WALES AND MONMOUTHSHIRE BRANCH: SWANSEA DIVISION

At a meeting of the Swansea Division held at Swansea on January 26, with the president, Mr. HOWELL GABE, in the chair, Dr. W. ERNEST LLOYD gave a lecture on "The Investigation of Diseases of the Chest."

Dr. Lloyd emphasized that an accurate history was essential in diagnosis. Diseases of the chest often suggested themselves by their characteristic history—for example, the sudden onset, usually at night, of bronchial asthma, and the history of a precedent lobar pneumonia, especially in children, followed later by cough and by sputum, which might be purulent, thus suggesting bronchiectasis. Lung abscess, spontaneous pneumothorax, and pulmonary tuberculosis had characteristic features obtainable from the patient's history. Discussing physical examination, he said the impaired percussion note on one side as compared with the other, the diminished air entry on that side, and the position of the apex beat would suggest a pleural effusion. It was important to ascertain the position of the apex beat and to note any change from the normal. Thus the usual methods of examination, beginning first with inspection and palpation, followed by percussion and auscultation, would reveal any obvious differences in either side. Sputum, if obtainable, should be examined. This was especially important in the diagnosis of pulmonary tuberculosis. In cases often considered to be of chronic bronchitis the physical signs of the bronchitis often masked the presence of pulmonary tuberculosis. Radiology should be regarded as part of a complete investigation and should not replace a clinical examination. It was of the greatest value when physical signs were indefinite and the disease was limited to a small area, as in the earliest stage of pulmonary tuberculosis or a localized area of pneumonitis. In cases of pleural effusion a sample of fluid should always be removed for examination.

A vote of thanks to Dr. Lloyd for his address was proposed by Dr. H. R. FREDERICK and seconded by Dr. ESMOND REES.

SUSSEX BRANCH: WEST SUSSEX DIVISION

At a meeting of the West Sussex Division, held on February 6, with Dr. R. H. WILSHAW in the chair, Mr. A. H. MCINDOE read a paper on "Burns," in which he gave reasons for not using tannic acid treatment in certain cases and described his method of treatment. A good discussion followed, many questions being answered by Mr. McIndoe.

UNITED PROVINCES BRANCH

At a clinical meeting of the United Provinces Branch held at Lucknow on August 30, 1940, the chairman, Dr. B. B. BHATIA, showed a case of hypophysial cachexia which had been shown twice before. The patient had improved considerably in many respects and was shown before being discharged. Dr. Bhatia also demonstrated a case of an unusual macrocytic anaemia in a woman of about 35 years responding poorly to liver preparations. An interesting discussion followed.

At a similar meeting held on October 25, 1940, with Dr. BHATIA in the chair, Dr. MOIZUDDIN showed the following cases: (1) paraplegia of the upper motor neuron type of sudden onset; (2) cough and haemoptysis (blood-tinged sputum) without any temperature in a healthy man: x-ray examination of the chest revealed a localized circular shadow on the left side of the chest. The CHAIRMAN demonstrated a case of hysterical paralysis of the lower extremities in a girl of about 10 years. Colonel MOHANI I.M.S., read a paper on "Evolution of Modern Medicine."

B.M.A. LIBRARY

The following volumes were added to the Library during December, 1940, and January, 1941:

Bailey's Textbook of Histology. By Smith, P. E., Carpenter, R. L., *et al.* Tenth edition. 1940.
Bawden, F. C.: Plant Viruses and Virus Diseases. 1939.
Boyden, A. L.: Income Tax for Medical Practitioners. 1940.
Cushny's Pharmacology and Therapeutics. By Edmunds, C. W., and Gunn, J. A. Twelfth edition. 1941.
Davies, N., and Isenburg, U.: Standard Radiographic Positions. 1940.
Glover, E.: Investigation of the Technique of Psychoanalysis. 1940.
Hamblen, E. C.: Endocrine Gynecology. 1939.
Herms, W. B., and Gray, H. F.: Mosquito Control. 1940.
Hume, E. H.: The Chinese Way in Medicine. 1940.
Jensen, D. M.: Nursing Care Studies. 1940.
Joachim, H.: Practical Bedside Diagnosis and Treatment. 1940.
Jordan, H. E.: Textbook of Histology. Eighth edition. 1940.
Lawrence, R. D.: Diabetic Life. Twelfth edition. 1940.
Lyle, K., and Jackson, S.: Practical Orthoptics in the Treatment of Squint. Second edition. 1940.
Moorman, L. J.: Tuberculosis and Genius. 1940.
Ramazzini, B.: De Morbis Artificum. Revised and translated by Wright, W. C. 1940.
Robson, J. M.: Recent Advances in Sex and Reproductive Physiology. Second edition. 1940.
Relleston, H., and Monerieff, A. (Editors): Special Surgery in War Time. 1940.
Sigurjonsson, J.: Studies on the Human Thyroid in Iceland. 1940.
Smith, K. M.: The Virus. 1940.
Smith, R. C. F.: Hygiene for Schools. 1938.
Souttar, H. S.: Art of Surgery. Fourth edition. Two volumes. 1940.
Steinach, E., and Loebel, J.: Sex and Life: Forty Years of Biological and Medical Experiments. 1940.
Vernon, H. M.: Health and Efficiency of Munition Workers. 1940.
Wilson, S. A. K.: Neurology. Two volumes. 1940.
Zinsser, H.: As I Remember Him: The Biography of R. S. 1940.

Medical Services of H.M. Forces

Appointments

ROYAL NAVY

Surgeon Commander W. P. Vicary has been placed on the Retired List.
Surgeon Lieut.-Commander H. A. Clarke to be Surgeon Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Probationary Surgeon Lieut. G. Hayes to be Surgeon Lieutenant.
To be Temporary Surgeon Lieutenants: A. Macleod and R. W. Tizzie.
Probationary Temporary Surgeon Lieut. I. F. Logan to be Temporary Surgeon Lieutenant.

ARMY

Major-General F. D. G. Howell, C.B., D.S.O., M.C., late R.A.M.C., has retired on retired pay.
Colonel (temporary Brigadier) J. A. Mansfield, D.S.O., late R.A.M.C., to be Major-General.
Colonels J. S. McCombe, D.S.O., late R.A.M.C., and S. W. Kyle, late R.A.M.C., have retired and remain employed.
Lieut.-Colonels W. K. Morrison, D.S.O., from R.A.M.C., H. C. D. Rankin, O.B.E., from R.A.M.C., and E. Percival, D.S.O., M.C., from R.A.M.C., to be Colonels.

ROYAL ARMY MEDICAL CORPS

Lieut.-Colonel W. J. E. Bell, D.S.O., retired pay, has reverted to the rank of Major at his own request, whilst employed during the present emergency.
Major D. Crun to be Lieutenant-Colonel.
Major (acting Lieut.-Colonel) P. J. S. O'Grady, has retired and remains employed.
Lieut. W. Allen has resigned his commission.

ROYAL AIR FORCE

Flight Lieut. H. D. Conway has been granted a permanent commission in the substantive rank of Flight Lieutenant.

ROYAL AIR FORCE VOLUNTEER RESERVE

B. Cates, to be Squadron Leader.

Flight Lieut. G. D Dawson has relinquished his commission on account of ill-health.

Flying Officers J. Apley, K. D. F Marle, M. Stein, F. T. Dodd, E. I. B. Hawes, J. A. Partridge, K. A. Boughton-Thomas, E. O. Evans, and J. T. Burrowes have been promoted to the war substantive rank of Flight Lieutenant.

To be Flying Officers for the duration of hostilities: C. C. Edwards, V. E. Gillis, J. T. Murray-Aynsley, J. G. Mathewson, J. C Kitchin, E. H. Hudson, J. Heginbotham, A. Redmond, W. E. C. Taylor, C. W. Hutt, J. A. Ward, W. N. Riley, K. E. Guest, J. M Gray, D. C. Caldwell, R. G. Mayall, D. V. Porter, G. Levy, N. S. Gurrie, D M. Roberts, T. A. Shaw, D. E. Meredith, J. C. Hutchinson, D. O. Hicks, C. W. J. Claydon, L. H. Boyd, A. J. Barwood, J. L. Morgan, K. G. Reynolds, A. Reid, W. E. Rigby, J. S. Hall, K. Hazell, J. Greene, H. H. Glatston, D. R. Sloan, M. Wynne, W. Wynroe, S. D. Perchard.

REGULAR ARMY RESERVE OF OFFICERS

Colonels J P. Lynch, late R.A.M.C., and G. de la Cour, O.B.E., having attained the age limit of liability to recall, have ceased to belong to the Reserve of Officers.

ROYAL ARMY MEDICAL CORPS

Captain (temporary Major) (acting Lieut.-Colonel) E. G. H. Cowen, to be Brevet Major, under the provisions of Article 168, Royal Warrant for Pay and Promotion 1940.

Captains (temporary Majors) D. J. Battetham and G. H. Wood to be Brevet Majors, September 1, 1939, and March 4, 1941, respectively, under the provisions of Article 168, Royal Warrant for Pay and Promotion, 1940.

Captains F. K. Tomlinson, G. Fleming, and H. G. Dresing to be Brevet Majors under the provisions of Article 168, Royal Warrant for Pay and Promotion, 1940.

SUPPLEMENTARY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Lieut. (War Substantive Captain) M. Bradford has ceased to belong to the Supplementary Reserve of Officers on account of ill-health.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

War Substantive Major D. G. Coutts has relinquished his commission on account of ill-health and retains his rank.

Captain C. S. France, from Manchester Regiment, to be Captain, October 16, 1940, with seniority August 2, 1935. (Substituted for the notification in the *Supplement* to the *London Gazette* dated November 1, 1940.)

Captain P. J. Gibbons has relinquished his commission on account of ill-health. (Substituted for the notification in the *Supplement* to the *London Gazette* dated April 24, 1940.)

Supernumerary for Service with Aberdeen University Contingent (Medical Unit, Training Corps)—J. S. Young, M.C., late Royal Highlanders, to be Lieutenant.

Second Lieut. H. A. W. Smith, from Unattached List (Infantry), to be Lieutenant.

LAND FORCES: EMERGENCY COMMISSIONS

ROYAL ARMY MEDICAL CORPS

P K McCowan to be Lieutenant (without pay and allowances) and has been granted the unpaid acting rank of Lieutenant-Colonel.

The surname of J. MacArthur is as now described and not as stated in the *Supplement* to the *London Gazette* dated January 28.

Lieut. (acting Major) K. B. Dickson, T.D., to be Lieutenant, and has relinquished the rank of Major. (Substituted for the notification in the *Supplement* to the *London Gazette* dated March 19, 1940.)

Lieuts. (War Substantive Captains) S. F. Ferguson and A. de Redder have relinquished their commissions on account of ill-health.

The surnames of Lieuts. W. J. McGinness, F. B. Yonge, and Y. Ivenitzki are as now described, and not as notified in the *Supplements* to the *London Gazette* dated March 5, 1940, and January 10 and 14, 1941, respectively

Lieuts. V. W. Maxwell and A. G Martin have relinquished their commissions on account of ill-health.

Lieut. J H. Hill has resigned his commission.

To be Lieutenants: H. R. Chapman, H. S. Marwick, D. E. Dunnill, J. G Hughes, J. N. Strauss, R. D. Firth, D. N Kelsey, P. Franklin, B. P. Armstrong, A. M. Boyd, I. B. Cadas, A W. Chester, E. L. Cohen, D. V. Davies, J. H. Lancaster, T. E Jones-Davies, R. McNeilly, H. Matthews, J. Minton, H. B. Morris, S. H. Segerman, R. Shaw, D. W. Shields, R. West, J. Alcorn, G. W. Aston, E. McL. Barbour, E. M. Calvey, B. S. Carter, D. H. Cammack, J. T. Farr, H. J. Friend, C. E. Gorrod, J. W. Gibson, T. W. Greatorex, T. S. Heslop, R. S. Hynd, J. Irvine, W. M. Jones, J. D. McGregor, A. Rapoport, G B. Robinson, S. Smith, W. Somerville, H. E. Stewart, D W. Warren, R. T. B. Watson, G. A. Wilson, H. Burton, R. Carmichael, H. Doyle B Day, D. P. Clahane, J. A. Crawford, S. S. Davidson, D. Ferguson, A. Tober, A. Y. Adam, J. O. Collin, W. I. Daggett, C. G MacB. Donaldson, J. Essex, J M. Fleming, L. C. L. Gonet, A. D. Gould, G C. Gundersen, J Hynes, C. K. B. Lennox, E. R. R. Mellon, M C Muir M E Moore, E. A Ritchie, A. I. Shaw, R. H. Smythe, A. A. Spiro, D C Sturdy, W. G. Sugden, I. M. Vites, B. J. Wilton, W. T. J. Fowler C V. A Henriques, J. Lubran, F. H. Scoones, J. D. Burrows, T G Cameron, J. Cohen, K. A Flaherty, W. E Gifford, J. Gilchrist, K Kumar, K. C. Matheson, A. M Russell, J N. Shepherd, E. Snell, E. Davison, R W. R. Atcheson, C. Black, H. J. Brennan, D. Christison, P J R Davis, C. T J Drobig, C. B. Franklin, M E. S. Harrison, H Harris, C. K Holland, M. J. Ingram, W B. Kelsey, R. S. Kirk, W S McConnell, W. McManus, S H. Madden, T. J. Martin, F. S. A. Maw G S Moore, M J Murphy, P. H. Nankivell, W. F. O'Connell, T C Porter, C H. Robinson, D Romney, R J Russell, H. V. Sankarayya, R B Scott, P E Sundt, T. I Thomas, E. W. J. Townsend, D. R. Tully, A S Wigfield, F. Wilson, A. Winder, R. Wyllie, H. Fidler, E. A. Joyce, A L T Beddoe, W L B. Burns, J. B. W. Dunlop, P. E. Fitzpatrick, A C Gardner, V A Goldman, C B. Hinkley, J. Howell, I. Kirchlew, R W Patterson, E. H D. Phillips, S. B Rea, A. F. Ritchie, G. Savill, H Simmonds, T. Walker, J. Wallman, J. H. West, T. P. Williams, J. R. Winter, A. G. Stephenson, J Gordon-Wilson, S. Cohen, L. McAske, K. A. Moore M Shalet, G D W Adamson, G. A. S. Akeroyd, D W. Bailey, R. A Burn, W. K. Chalmers, J. Clutton-Brock, V. G. S. Damms, J. G. Gow, W G S Harden, J. N Hennessy, W. E Hick, L. Jaffe, M. E. M. King, F. W. McKenna, R R Maitland, G. W Miskin, A. O. Nairn, F. G. Neild, R Neilson, W B Nelson N. P. Orchard, W. L. Rose, L. R. Routledge, R W Rowan, F A. Sacco, F. Sandy, J. E. Schofield, J. C. Sergeant, M H Sherwell, H D. Whitley, R M. Ellison, T. A. Rean, J. P. Cosgrove, G Edwards, G. J Evans, E. J Ewell, J A. Jones, K Page, F. Besser, M Shepherd, K. S. Thom, G. P Christopoulos, J. J. McAndrews, H. M. Marks, J T Westby, C. R. Amies, J B Kershaw, E. B. Morley, B. Grellier, W J A MacMahon, A D. F. Cornzal, J. F Goodall, C. Gordon, J. S. Hollingworth, G H Johnston, A B Hay, J. S. MacRae, G. K. McGowan, R Mallinson, G B Petrie, A J Pirie, J. Renwick, G. H. Shaw, W. R. Thomson, W. G. Tregea, W. V. Wallace, M. H. Waters, A. M. W R. Murphy, J. I. Sapwell, G. W. Bathgate, S. F. M. Cressall, D. R. Da J. E. G. Earle, I. C. Fletcher, L. Greenbaum, G. E. Hyden, T. Las D. Matthews, J. F. Meredith, J. Meynell, W. O. G. Paget, M. R. W. Spa J. H. Taylor, O. S. Thompson, L. Tobias, G. F. N. Anderson, I. Ap-Thon J. W. Ashforth, W. Brown, F. R. M. Calder, J. L. Campbell, M. H. Cl W. C. Colville, M. I. Elliott, J. L. Fleming, J. B. Hannah, H. J. I A. W. Lees, I. B. MacKay, R. W. McNamara, T. W. Palmer, E. H. Pl D. F. Rees, N. C. Sharp, B. G. Thompson, A. J. Varga, E. P. Scott, A. Walker, T. S. Jones, J. D. O'Riordan, I. E. Harries, G. L. Simmons, W. J Taylor, J. D. Benjafield, G. A. Macadie, A. Cohen, W. Campbell, J. W. Co R. A. Corbett, J. A. Fraser, A. H. Granat, R. W. Hutchinson, A. F. Hutchis L. Ingram, J. B. Jack, L. Linnell, M. P. McCormack, J. H. Middlem A. J. Reeves, L. J Rosin, A. L. Thorp, J. W. Totten, J. Wainwri N. H. Wass, E. Samuel, M. M. Lewin, B. D. Consul, B. D. Merrin, A. Saleh, J. L. Morton, J. W Howie, J. McSorley, A. J. Gardham, M. Goldi D. D. Pinnock, P. K. D. Edmunds, H. M. Stephenson, W. K. Badgett, W. Clark, P. J. H. Clarke, A. Coleman, R. J. Edney, D. S. Edwards, S. Kul F. Luckett, W. W. Millen, T. V. Richard, V. St. G. Vaughan, L. R. Dalt G. P. Mitchell, F. W. Newby-Good, J. D. Philp, H. C. Dundon, A. M. Cant M. S. Chayen, E. Epstein, R. F. Fairweather, J. C. Hardy, G. O'Gorm E. W. Peet, H. A. Sharpes, J. Stern, B. Stone, P. A. Walford, C. C. Doherty, A. August, I. D. Campbell, F. B. Coates, H. Elliman, I. J. Epr E. Howitt, J. I. Sneider, H. Mattison, W. C. Mitchell, K. V. Robins A. L. Rosenthal, I. Smith, J. E. Vooght, W. Newlands, D. L. Bayley, A. Cook, M. Carr, K. Damodaran, H. V. Dicks, P. Esmonde, R. M. J. Fran D. J. H. Goodhew, R. Hylton, B. McD. Johnson, A. Kellner, G. K. Marsh A. B. Moffatt, C. J. B. Murray, E. D. V. Nicoll, J. W. E. Ord, N. Plummer, C. W. Stewart, T. Wright, G. E. Yardley, J. H. Yound, S. Levit

To be Medical Officers with the relative rank of Lieutenant: Christine F. Saville, Muriel H. E. Long, Jean M. Laidlaw, Edith K. P. Harris, Dorothea Graham-Service, Alice P. M. Hennessy, Albertine L. Winner, Bridget S. Gurney, Joan Halstead, Adelaide E. Anderson, Muriel B. O'Dogherty, Mabel Bain, Clare F. Lyons.

ARMY DENTAL CORPS

I. W. E. Snawdon, M.B., to be Lieutenant.

Postgraduate News

The Fellowship of Medicine announces the following postgraduate courses for Final F.R.C.S. candidates: (1) orthopaedics (theoretical lecture-demonstrations, illustrated by *x*-rays, on Wednesdays 2.30 p.m., at Medical Society of London, 11, Chandos Street, W March 26 to April 30; (2) comprehensive revision course at Roy Cancer Hospital, clinical and theoretical teaching, daily, 10 a.m. 1 p.m., March 31 to April 25; (3) practical operative surgery cours thrice weekly, 2 p.m., March 31 to April 25.

WEEKLY POSTGRADUATE DIARY

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpol Street, W.—*Brompton Hospital*, S.W.—Mon. and Thurs., 4.45 p.m. M.R.C.P Course in Chest Diseases. *West End Hospital for Nervous Diseases*— Tues. and Fri., 3.30 p.m. Clinical Demonstrations in Neurology. *Roya National Orthopaedic Hospital*, Stanmore.—Sat., 2.15 p.m. F.R.C.S. Clinica Orthopaedic Course. *Medical Society of London*, 11, Chandos Street, W.— Tues., 2.30 p.m. F.R.C.S. Neurological Surgery Course: (1) and (2) Sym pathetic Nervous System.

DIARY OF SOCIETIES AND LECTURES

ROYAL SOCIETY OF MEDICINE

Section of Pathology.—Tues., 3.45 p.m. Annual General Meeting. Papers by Dr. D. M. Pryce, A Simple Method of Growing Tubercle Bacilli in Sputum Films; Dr. R. A. Kekwick and Dr. B. R. Record, The Electrophoretic Fractionation of Diphtheria Antitoxic Horse Serum; Dr. Douglas McClean, The Capsulation of Streptococci and its Relation to Hyaluronidase (Diffuse Factor); Mr. A. D. McEwen, Problems Relating to the Immunization of Cattle against *Br. abortus*.

Section of Neurology.—Wed., 2 p.m. Exhibition of Pathological Specimens and Preparations. 2.30 p.m., Discussion, Fat Embolism of the Brain. *Openers*, Drs. A. H. Robb-Smith, Dorothy Russell, J. G. Greenfield, and A. H. Hunt.

Section of Dermatology.—Thurs., 4 p.m. Short illustrated papers on "Clinical Photography" by Drs. J. H. Twiston Davies, F. A. E. Silcock, F. S. Airey, and Mr. T. Pomfret Kilner. Histological sections will also be shown.

Clinical Section.—Fri., 2.15 p.m. Meeting at King's College Hospital, Denmark Hill, S.E.5. Cases and specimens.

Section of Radiology.—The meeting announced to be held on Friday, March 21, has been postponed. Further details will be announced later.

BIOCHEMICAL SOCIETY.—At University College Hospital Medical School, University Street, W.C., *Fri.*, 2 p.m. Meeting.

VACANCIES

EXAMINING FACTORY SURGEONS.—The following vacant apointments are announced: Sherborne (Dorset); Markinch (Fifeshire). Applications to the Chief Inspector of Factories, Cleveland House, Page Street, S.W.1, by March 25.

APPOINTMENTS

DICK, Nancy K., M.B., B.S., M.R.C.S., L.R.C.P., Deputy Medical Superintendent, South Middlesex Emergency and Fever Hospital.

BIDEN-STEELL, K., M.D., has been appointed one of His Majesty's Inspectors of Factories.

EXAMINING FACTORY SURGEONS.—G. T. Drummond, M.B., Ch.B., for the Coatbridge District (Lanarkshire); G. I. Lambe, M.B., B.Ch., B.A.O., D.P.H., for the Darlaston District (Staffordshire); G. S. Landon, M.R.C.S., L.R.C.P., for the Lewisham District (London).

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. The amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

BIRTH

REID.—On February 27, to Rosamund (*née* Hench) and Dr. T. H. Reid, of Woodnook, Selston, Notts, a son.

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CRUSH INJURIES WITH IMPAIRMENT OF RENAL FUNCTION

BY

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AND

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[WITH SPECIAL PLATE]

Amongst air-raid casualties seen at this hospital have been four cases of crush injury of the limbs which, because of the general similarity of their clinical course, were thought to represent a specific and hitherto unreported syndrome, and one which has been and will be seen elsewhere during the war. Such a condition may have been observed in civil practice, but we have been unable to find any account of it in the literature. The cases are of interest on account of the problem propounded by both pathogenesis and treatment. The picture presented by these four cases, and substantiated by others, is briefly as follows:

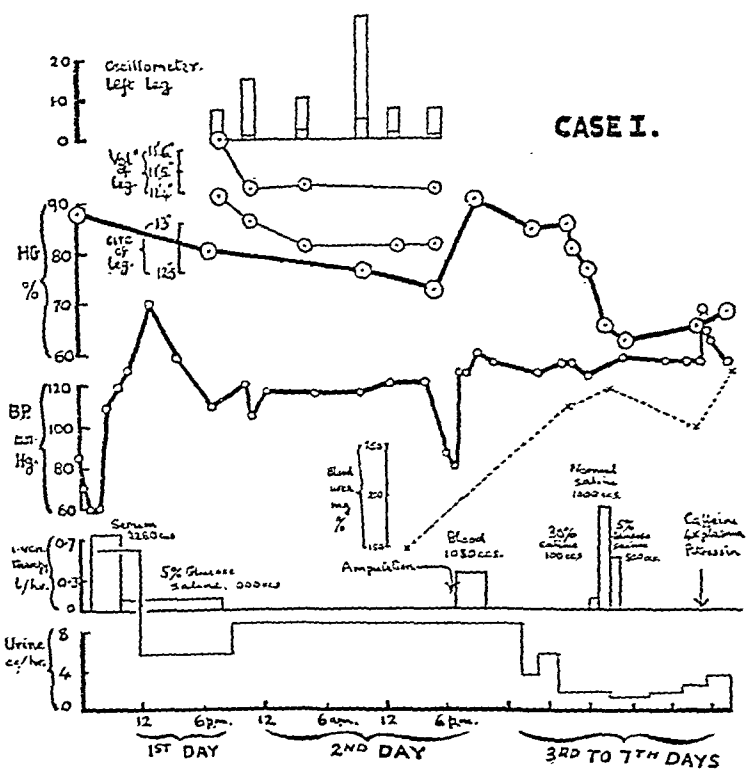


CHART I.—Case I.

The patient has been buried for several hours with pressure on a limb. On admission he looks in good condition except for swelling of the limb, some local anaesthesia, and wheals. The haemoglobin, however, is raised, and a few hours later, despite vasoconstriction, made manifest by pallor, coldness, and sweating, the blood pressure falls. This is restored to pre-shock level by (often multiple) transfusions of serum, plasma, or, occasionally, blood. Anxiety may now arise concerning the circulation in the injured limb, which may show diminution of arterial pulsation distally, accompanied by all the changes of incipient gangrene. Signs of renal damage soon appear, and progress even though the crushed limb be amputated. The urinary output, initially small, owing perhaps to the severity of the shock, diminishes further. The urine contains albumin and many dark brown or black granular casts. These later decrease in number. The patient is alternately drowsy and anxiously aware of the severity of his illness. Slight generalized oedema, thirst, and incessant vomiting develop, and the blood pressure often remains slightly raised. The blood urea and potassium, raised at an early stage, become progressively higher, and death occurs comparatively suddenly, frequently within a week. Necropsy reveals necrosis of muscle and, in the renal tubules, degenerative changes and casts containing brown pigment.

Case I

A female aged 17 had been buried for nine hours with heavy masonry lying across the left leg. On admission she showed slight bruises generally, and multiple superficial abrasions below the left knee. The leg was swollen and sensation was impaired at the ankle, where all power and movement were lost. Other limbs appeared undamaged. The skin was pallid and clammy; the blood pressure was 85/70 mm. Hg. The clinical course is shown on Chart I. Recalcified plasma-saline (Clegg and Dible, 1940) (subsequently referred to as "serum"), followed by 5% glucose-saline,

brought the blood pressure from 60 mm. Hg, where it had remained for one and a half hours, to 160 mm. Hg. Urine was passed containing neither albumin nor blood.

By 7 p.m. the haemoglobin concentration had fallen. Blisters were forming on the left knee, where there was a joint effusion. Less oedema of the leg was now present than on admission; measurements were made of leg circumference, of leg volume (by a tape method),* and of pulsation by means of an oscillometer. During the next twenty-four hours the volume and circumference of the leg decreased. However, the oscillometer readings, after a deceptive rise towards normal, fell to the low initial level, even though during this

TABLE I.—*Biochemical Findings in Case I: Blood*

Date	Time	Urea	Plasma Inorg. P	Plasma Chlorides (as NaCl)	Plasma Proteins				Alkali Reserve	Serum Potassium
					Total	Albumin	Globulin	Fibrinogen		
		mg. per 100 c.cm.	mg. per 100 c.cm.	mg. per 100 c.cm.	gm. per 100 c.cm.	gm. per 100 c.cm.	gm. per 100 c.cm.	gm. per 100 c.cm.	c.cm.[1]	mg. per 100 c.cm.
Dec. 5	2 p.m.	148	—	584	6.9	4.0	2.8	0.1	50	30
,, 7	10.40 a.m.	286	—	498	—	—	—	—	42	—
,, 8	11 a.m.	305	7.3	615[2]	6.2	—	—	—	40	31[3]
,, 10	2.30 p.m.	268	—	575	—	—	—	—	—	33
,, 11	12.20 p.m.[1]	320	7.7	496	6.6	3.7	2.7	0.2	—	34[4]

[1] At death.
[2] Received 1,000 c.cm. of saline.
[3] Uric acid 10.8 mg., creatinine 2 mg., plasma sodium 307 mg.
[4] Serum calcium 9.1 mg.

TABLE II.—*Biochemical Findings in Case I: Urine*

Date	Time	Volume	Protein	Urea	Chlorides (as NaCl)	Benzidine Reaction	Deposit
		c.cm.	mg. per 100 c.cm.	mg. per 100 c.cm.	mg. per 100 c.cm.		
Dec. 4	12 *noon*	96	0	—	640	Negative	
	9 p.m.	50	0	—	—	,,	
,, 6	10.30 a.m.	332	60	—	270	Positive	
	5 p.m.	22	350	—	360	,,	Hyaline, red cell, and granular casts
,, 7	7.30 a.m.	80	800	—	560	,,	Pus cells + bacteria
,, 8	11 a.m.	50	1,000	514	520	,,	
,, 9	10 a.m.	30	900	—	480	,,	
	9 a.m.	38	900	570	520	,,	
	5.55 p.m.	4.5	—	720	440		
	6.45 p.m.	14.2	—	680	440		
,, 10	8 p.m.	4.8	—	770	440		
	9 p.m.	3.4	—	750	410		
	10 p.m.	2.2	—	740	420		
,, 11	9.15 a.m.	38	—	770	420		

period the left leg had been bandaged and elevated to 50 degrees on a Thomas splint for two hours. The second specimen of urine still showed neither albumin nor blood.

By 6 p.m. the next day the left leg was cold below the knee and blue, and amputation was proposed. This was done under vinesthene and gas-and-oxygen. Citrated stored blood (Group O) was given during and after operation, restoring the blood pressure, which had temporarily fallen, to the pre-operative level. Urines collected after this showed albumin and gave a positive benzidine reaction; hyaline, granular, and what appeared to be red cell casts were noticed, besides free red corpuscles.

During the next five days the patient continued drowsy and apathetic, from which state she was easily roused by the slightest stimulus to become anxious and apprehensive, without, however, any loss of mental clarity. The output of urine became very small, despite a fluid intake by mouth of between 1.5 and 2.5 litres daily; vomiting continued (between 50 and 250 c.cm. daily). Normal saline (1 litre), 30% saline (100 c.cm.), and 5% glucose-saline, followed later by caffeine benzoate (140 mg.), 85 c.cm. of four-times-normal reconstituted dried serum (obtained from the Medical Research Council serum-drying unit), with, in addition, pitressin 1/100,000, were given intravenously, and hot bottles were applied to the loins. Despite these measures, directed towards restarting urine flow, the patient, whose blood pressure was maintained at 130/70, suddenly collapsed at 12.13 p.m. on the eighth day and died in three minutes. A systolic murmur at the apex and dropped beats had been noticed for forty-eight hours before death, and an electrocardiogram taken forty-one hours before death showed merely low voltage. A second, sixteen hours later, showed widening of QRS, higher voltage, increase in Q_1, and inversion of T_3. Biochemical findings are listed in Tables I and II. Necropsy was performed two and a half hours after death.

SUMMARY OF POST-MORTEM RECORD BY DR. THOMAS BELT

The point of major interest was the condition of the kidneys. They were large, weighing 210 and 230 grammes respectively, rather dark red and firm, quite smooth of surface, having tense capsules due to swelling of the cortices. The cut edges everted; the cut surfaces were wet and glassy owing to oozing of serous fluid. Parts of cortex midway between renal pyramids were blanched by a zonal ischaemia. There was no evidence of ascending infection. The bladder was slightly reddened, and contained a few drops of very thick cloudy urine. Subcutaneous and retroperitoneal tissues oozed serous fluid when cut, indicating a slight generalized oedema. Marked cyanosis was evident in the internal parts, but the skin was pale. Other organs and tissues presented no striking change.

Microscopical Examination.—Kidney: The main change was to be found in the tubules. The convoluted tubules and the loops of Henle were severely damaged. The cytoplasm of the lining epithelium was swollen, frayed, granular, and vacuolated. Individual cells here and there were devitalized and desquamated, while those that remained attached showed fairly frequent mitotic figures. The cast-off cells in various stages of disintegration merged in the lumina with loose collections of eosinophilic debris. In the loops of Henle and the collecting tubules there were numerous casts of dense eosinophilic material, most of which had a brownish colour, as though lightly stained with bile or blood pigment. These casts seemed to be all of the same substance, though their morphological appearance varied a good deal, depending upon the degree of condensation they had undergone. Some looked not unlike collections of disintegrating erythrocytes; others simulated shreds of fibrin or beaded ribbon, while still others were condensed into solid hyaline cylinders. They seemed to be compounded of dead epithelial cells, inspissated albumin, and perhaps hyaline material exuding from the lining of the tubules. One could identify an occasional erythrocyte within the tubules, but, so far as could be determined by histological means, the majority of the casts were not red cell casts, though some of their colour might have been due to haemoglobin. They were probably not of a specific type, as similar casts are to be seen in acute nephritis and other conditions where there seems to have been great reabsorption in the tubules, resulting in a scanty concentrated urine. Some of them were surrounded and invaded by leucocytes, and, in the lower reaches of the straight tubules, leucocytes were sometimes the predominant constituent. Here and there a cast-filled tubule was undergoing disintegration and was surrounded by inflammatory cells. Stains for iron were negative. Fatty changes were absent. The glomeruli showed no obvious structural change, though the frequent presence of albuminous material in Bowman's capsule suggests that they had not escaped injury. The glomerular tufts contained relatively little blood, but the vessels of the medullary parts were greatly engorged.

Other Tissues.—Thyroid: Signs of commencing activity with increased height of cells and many mitoses. *Liver:* cloudy

* Worked out in conjunction with D. K. Hill. An inextensible tape of width (w) is wound round the limb without overlapping. The length of tape (L), thus enclosing a certain volume (V) by a number of turns (n), is given by the formula:

$$L = \sqrt{\frac{4\pi nV}{kw}}$$

where k is a constant dependent on the shape of the leg. In Case I direct measurement of volume by water displacement gave k a value of 0.90.

swelling but no necrosis. Adrenal: patchy loss of cortical lipoid. Heart: vacuolation of neuromuscular fibres (bundle of His). Muscles of right leg: not abnormal.

The amputated leg showed haemorrhage in the popliteal fossa around the artery, extending along the intermuscular fascial planes. There was no oedema beneath the deep fascia, but slight superficial oedema with punctate haemorrhage was present over the pressure areas in the skin. There was a haemarthrosis of the knee-joint, with cracks in the patella and tibial cartilages, extending down across the bone of the tibial condyle. Sections of artery showed no lesion: sections of muscle (which macroscopically looked normal) revealed a few fibres (1%) undergoing necrosis, with loss of striation and staining power.

Case II

A female aged 45 had been crushed under a collapsed building for six hours. On admission there was a large scalp wound and lacerations and bruises of both legs, on which debris had been pressing. Both calves were extremely hard, swollen, and tense. The blood pressure was 130 98, and, despite considerable bleeding from the scalp, the haemoglobin amounted to 92%; the pulse was 130. (See Chart II.) Measurements were taken of leg volume. Pulsation (oscillometer) was decreased in both legs. The scalp wound was sutured under gas-and-oxygen and ether.

Two hours later haemoconcentration developed and the blood pressure fell. Repeated infusions of "serum," plasma, and saline restored the blood pressure to 115 mm. Hg; then, following a transfusion of citrated stored blood, to the abnormally high level of 160 mm. Hg. With the rise in blood pressure the volumes of both legs increased, and the oscillometric readings fell. Dark smoky urine was obtained by catheter next day, showing albumin and red cell and hyaline casts.

At 2 p.m. she was vomiting and had oedema of the face, eyelids, and arms as well as the legs. Venous blood showed raised urea (115 mg.), plasma chloride (801 mg. as NaCl), and serum potassium (28 mg.), and a lowered CO_2-combining power (41 c.cm. per 100 c.cm.). Pulsation had returned in the right leg but not yet in the left. The chloride content of the body was therefore reduced (by sweating, purgation, and replacement of gastric juice by sodium bicarbonate) and the oedema disappeared, except from the legs. During the next three days her condition remained the same: the blood pressure reached as high as 168 104, and, while the plasma chloride and alkali reserve fell, urea, phosphates, and potassium steadily rose. Urinary output was very low (50 c.cm. daily) in spite of a daily intake of between 1½ and 2 litres. The urine became blood-free but infected (catheterization), and showed a low chloride concentration.

On the sixth day at 11.15 p.m. the patient became distressed, cold, and wet with sweat: a systolic murmur was heard at the apex and the blood pressure fell to 106 85. An electrocardiogram taken before this (at 7 p.m.) showed bundle-branch block. The pulse suddenly fell to 70 (previously steady at 100) and showed dropped beats. She died at 12.10 a.m. on the seventh day. Biochemical findings are shown in Tables III and IV.

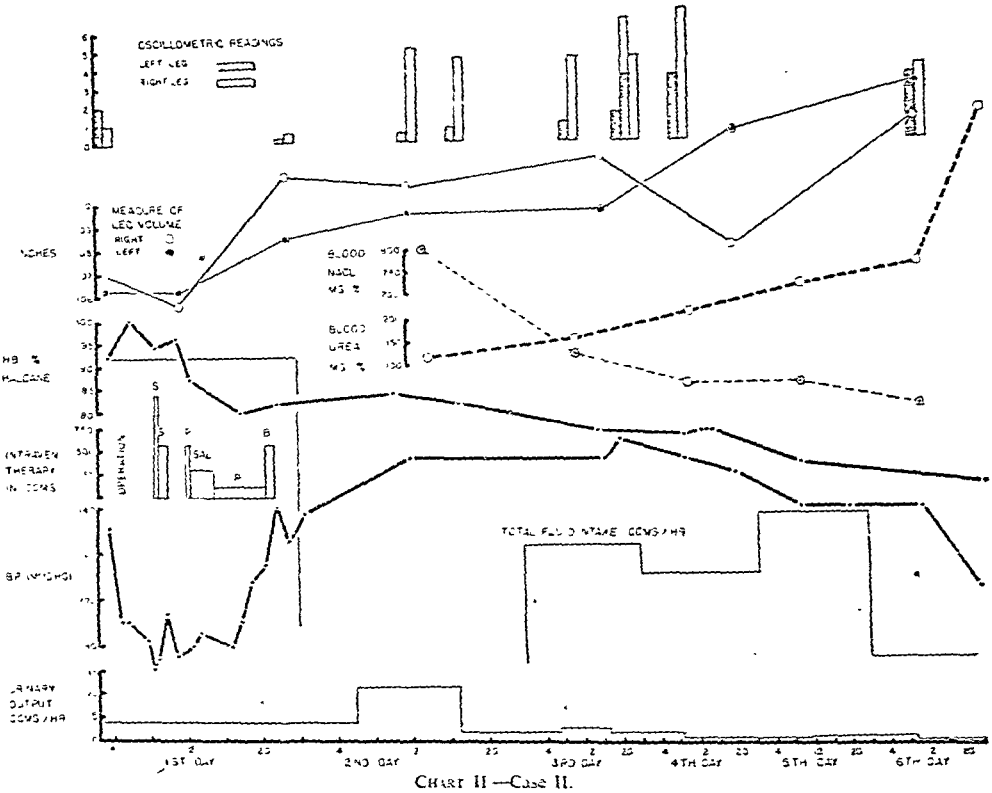


CHART II—Case II.

TABLE III.—*Biochemical Findings in Case II: Blood*

Date	Time	Urea	Plasma Inorg. P	Plasma Chloride (as NaCl)	Plasma Protein	Serum Potassium	Alkali Reserve
		mg. per 100 c.cm.	mg. per 100 c.cm.	gm. per 100 c.cm.	gm. per 100 c.cm.	mg. per 100 c.cm.	c.cm.
Dec. 5	2 p.m.	115	—	801	7.1	28	41
" 6	11 a.m.	156	—	572	—	—	49
" 7	11 a.m.	214	11.1	513	—	—	43
" 8*	10.30 a.m.	270	9.2	513	6.9	—	34
" 9	11 a.m.	314	12.9	464	—	32	30
	at death	640	—	—	—	34	30

* Uric acid 10 mg., creatinine 2 mg., and serum sodium 290 mg.

TABLE IV.—*Biochemical Findings in Case II: Urine*

Date	Time	Volume c.cm.	Protein mg. per 100 c.cm.	Urea mg. per 100 c.cm.	Chlorides (as NaCl) mg. per 100 c.cm.	Benzidine Reaction	Deposit
Dec. 5	6 a.m.	92	400	—	160	Positive	Dark and smoky. Many blood casts. Some red cells, few granular casts
	5.15 p.m.	134	—	—	180	"	
" 6	7.30 a.m.	25	400	—	240	"	Red cells. Red cell casts. Pus cells
	5 p.m.	20	300	—	180	"	
" 7	8.30 a.m.	21	160	—	180	"	
" 8	11.30 a.m.	15	400	520	240	"	Pus. Micro-organisms. Few red cells
" 9	10 a.m.	16	900	—	320	"	
	at death	16	800	670	240	"	

SUMMARY OF POST-MORTEM RECORD BY DR. THOMAS BELT

Necropsy twelve hours after death: Calf muscles on both sides showed widespread necrosis. They were blanched and swollen as if parboiled, and mottled with haemorrhagic areas. The vessels of the legs were apparently undamaged. The kidneys were relatively large (weighing 190 and 170 grammes), smooth, tense, and dark red. There was no pyelitis. The bladder mucosa was slightly reddened; the liver was swollen (1,830 grammes); and the lungs were slightly oedematous (500 grammes each).

Microscopical Examination.—Kidney changes were very much like those in Case I. There were perhaps more leucocytes in the tubules, and these occasionally extended right up into the cortex. The liver showed cloudy swelling but no necrosis. Muscle displayed widespread necrosis, chiefly coagulative but becoming liquefactive in small foci. There was much patchy haemorrhage and polymorph reaction in disintegrating areas, but no bacteria. Some small vessels in the section showed necrosis of the wall. The pancreas had a few patches of fat necrosis, and the adrenal gland showed patchy loss of cortical lipoid. Other tissues appeared normal.

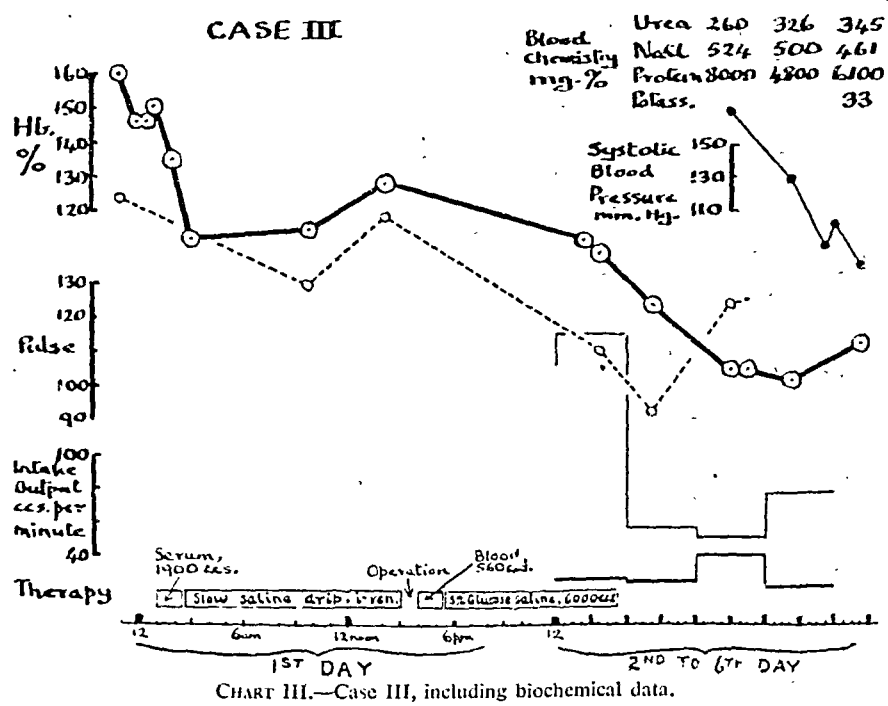


CHART III.—Case III, including biochemical data.

Case III

A male aged 34 was pinned down by beams across shoulders, arms, and thighs for twelve hours. On admission he was pale and shocked, with great swelling of both arms and thighs, and skin-whealing at pressure sites. There was occasional vomiting (about 120 c.cm. daily). The blood pressure could not be taken on account of the swelling. 1,900 c.cm. of "serum" was given intravenously over ninety minutes, reducing the haemoglobin from 160 to 112%. (See Chart III.) Next day the left arm appeared greatly swollen, and the hand blue, cold, and pulseless. An incision was therefore made from mid-arm to below the elbow, relieving the tension beneath the deep fascia so that the brachial artery again began to pulsate. This was followed by a transfusion of 460 c.cm. of blood (Group O). Urine was passed—specific gravity 1015—containing albumin and blood but no casts. On the third day the left hand was warm but still devoid of sensation and power: there was oedema of both thighs, but a radiograph showed that there was no bony lesion. The patient continued to vomit about 100 c.cm. daily; 6 litres of 5% glucose-saline had been given intravenously over this and the previous day. There was some incontinence of urine, of which, however, 655 c.cm. was collected. On the fourth day, despite a fluid intake of 1,340 c.cm., 590 c.cm. of urine was passed, still containing albumin. At 5 p.m. the temperature rose suddenly to 103.4°, and there was some redness around the site of the intravenous puncture. Sulphapyridine by mouth was started. On the fifth day vomiting, dyspnoea, and slight generalized oedema occurred, with crepitations at both bases and a pleuro-pericardial friction rub. A radiograph revealed slight basal congestion only; an electrocardiogram showed right axis deviation; the blood pressure was abnormally high (170–180 mm. Hg), and, despite a urinary output of 990 c.cm. in the day (on an intake of 1,230 c.cm.), the blood urea was 260 mg., the total plasma protein 8.0 grammes, and the plasma chlorides (as NaCl) 500 mg. per 100 c.cm.

During the sixth day the blood pressure fell progressively without further concentration. At 8 p.m. the patient had become delirious and disorientated, and the pulse rapid. The skin became cold, wet, and cyanosed. Coarse crepitations were heard at both bases: there was incontinence of urine, of which 530 c.cm. was collected, showing albumin and numerous red cells but no casts in the deposit. Oxygen was given. The fluid intake was 1,860 c.cm. The blood urea was 326 mg., the total plasma proteins 4.8 grammes, and the plasma chlorides (as NaCl) 500 mg. per 100 c.cm.

Death occurred on the seventh day, 160 minutes before death the blood urea was 345 mg., the total plasma proteins 6.1 grammes, the plasma chlorides (as NaCl) 461 mg., and the serum potassium 33 mg. per 100 c.cm.

SUMMARY OF POST-MORTEM RECORD BY DR. THOMAS BELT

Necropsy showed staphylococcal pyaemia due to thrombophlebitis of saphenous veins. There was extensive crushing of leg muscles. Microscopically, tubular changes in the kidneys resembled those of Cases I and II. There were numerous casts of similar character, but the picture was somewhat complicated by the presence of a few small pyaemic abscesses.

Case IV

A male aged 16 was buried under a collapsed house for eight hours, the left thigh being pinned down by a heavy load of masonry. On admission the systolic blood pressure was 140 mm. Hg, and superficial abrasions were present on the left thigh, later becoming whealed. On getting out of bed that afternoon he fainted. At 8 p.m. he suddenly collapsed; the haemoglobin had risen to 140% and the blood

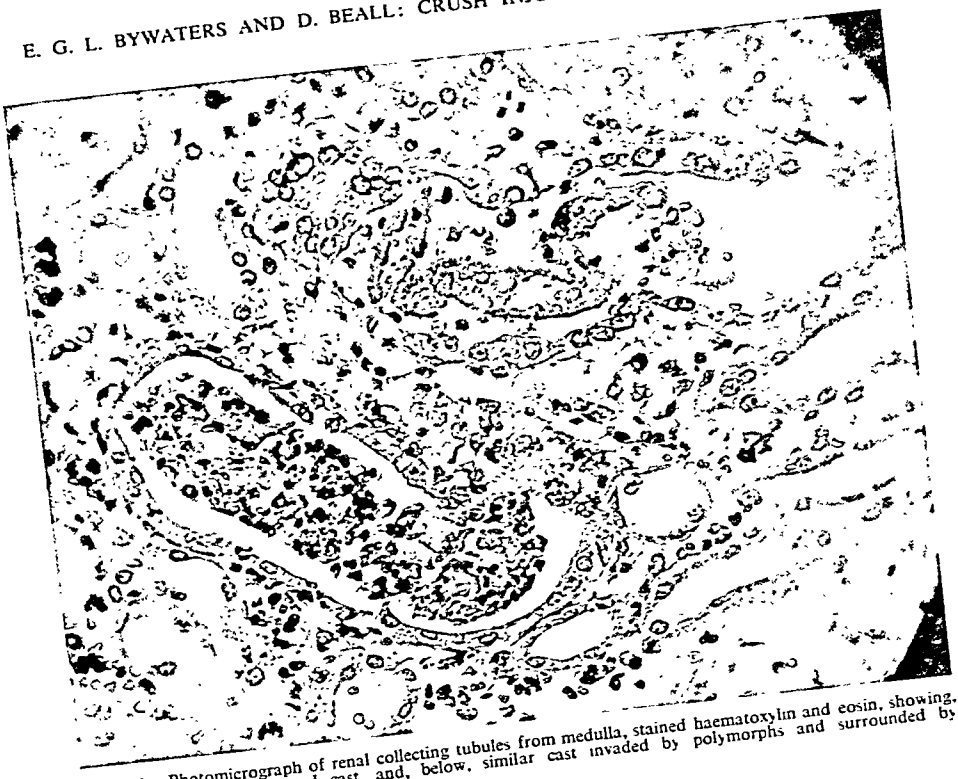


FIG. 1.—Photomicrograph of renal collecting tubules from medulla, stained haematoxylin and eosin, showing, above, ribbon-like pigmented cast, and, below, similar cast invaded by polymorphs and surrounded by desquamated epithelial cells. × 300



FIG. 2.—Photomicrograph of renal tubule from boundary zone, stained haematoxylin and eosin, showing necrosis of wall and commencing reactive changes. × 280.

pressure had fallen to 40 mm. Hg; the pulse rate was 108 per minute. Venous blood showed plasma protein to be 9.1 grammes and chlorides (as NaCl) 545 mg. per 100 c.cm. He was given normal saline, and then "serum" intravenously, which, as may be seen from Chart IV, brought the blood pressure to 96 mm. Hg, and the haemoglobin down to 85%; plasma protein was 7.9 grammes and chlorides (as NaCl) 705 mg. per 100 c.cm. This was immediately followed by serum, which effectively lowered the haemoglobin and

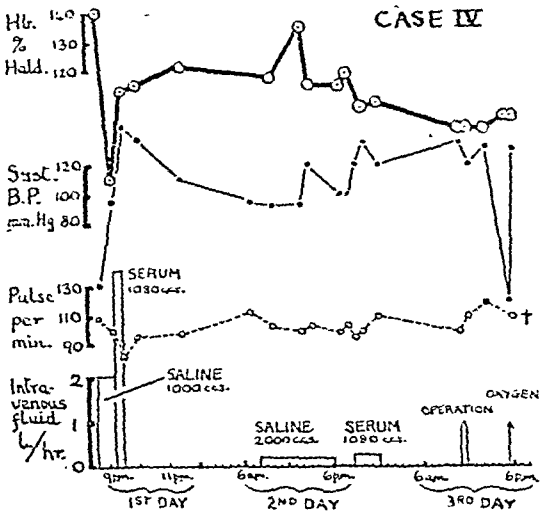


CHART IV.—Case IV (admitted nine hours before the beginning of this chart with a blood pressure of 140 mm. Hg).

raised the blood pressure to a comparatively high level. Next day further serum was given. On the third day the condition of the left foot, which had caused considerable anxiety, was worse: extensive oedema of the thigh had apparently cut off the circulation to the left foot, which was cold and pulseless. Under gas-and-oxygen and ether anaesthesia, incision was made into the left thigh to relieve pressure on the vessels: a feeble pulse was temporarily restored in the posterior tibial artery. Tissue fluid from the thigh contained 1.9 grammes of protein per 100 c.cm. Five hours after the operation the patient suddenly collapsed; although the haemoglobin remained at 105%, the blood pressure fell to 30 mm. Hg. After giving oxygen by B.L.B. mask the pressure rose to 130/82. This restoration of blood pressure was, however, only temporary, and the patient died three hours afterwards. During the last two days there was much vomiting and the abdomen was extremely tense. The urinary output was very low throughout.

Necropsy, by Dr. Keith Simpson, forty-eight hours after death, showed crushed and oedematous muscles of the thigh, with interstitial haemorrhages. There was no bony lesion, no injection, and no gross change in other organs.

On microscopical examination (Dr. Thomas Belt) the muscle showed patchy necrosis, and infiltration with polymorphs. The kidney and other organs were not thus examined.

Discussion

THE RENAL LESION

This consists structurally of severe degenerative changes in the proximal convoluted tubules and, in the more distal part of the nephron, brown pigmented casts of a colour, in unstained preparations, similar to that of blood corpuscles. There are reactive changes round the casts and desquamated epithelium in the medulla (Figs. 1 and 2 on Plate). The matrix of the casts is thought, on histological grounds, to be composed not of red corpuscles but of desquamated epithelial cells. The pigment might therefore be accounted for either by excretion into the lumen from the blood stream of haemoglobin, myohaemoglobin, or bile pigment, or possibly by the extrusion into the lumen of cells already pigmented.

Changes very similar to these are described following mismatched transfusion (Witts, 1929; Goldring and Graef, 1936; Baker, 1937). There is the same absence of changes in glomeruli, and similar changes in the convoluted tubules, in the interstitial tissue, and in the straight tubules. The casts are not composed of red cells, but sometimes there are spherical bodies resembling them. Baird and Dunn (1933) and others have noted similar casts containing "haemoglobin" in eclampsia.

The effect on function of blockage by casts is obscure: if this were the only lesion, what urine was secreted (through unobstructed tubules) should be of normal composition. The urine resembled, however, more a glomerular filtrate; there was no significant concentration of urea (hence no selective absorption of water), and in Case I there was failure to reabsorb chloride when the blood level was below 500 mg. per 100 c.cm. Case II showed some degree of chloride reabsorption. There thus appears to be dysfunction of the convoluted tubules. Whether partial blockage or blockage of a few tubules—cf. the kidney after mismatched transfusion, in multiple myeloma (Forbus *et al.*, 1935; Holman, 1939), and in calcification affecting the pyramids (Albright *et al.*, 1940)—can so raise the intrarenal pressure as to interfere with tubular function as well as with glomerular filtration is not known. It has recently been suggested (Navasquez, 1940) that the degree of tubular blockage is not sufficient to account for the symptoms associated with "transfusion kidney." The hypertension in Cases II and III, and also noted in the case reported elsewhere in this issue (Mayon-White and Solandt, p. 433), may be allied to other types of primary "renal hypertension."

It is possible that minor degrees of this renal damage may occur, since at least one patient with crushed limbs has been observed to recover completely (R. V. Christie, personal communication) with a raised blood urea and low urea clearance. In a similar case of muscle crush seen elsewhere (Beall, Belsey, Bywaters, and Miles, unpublished data) there was a definite tendency towards recovery of renal function, shown by the increasing resorption of both water and chloride. Certain cases of post-operative anuria may prove to fall into this category, but the majority of them appear to be associated mainly with decreased blood volume and blood pressure, since restoration of blood volume to normal improves the renal output.

In Case I fibroblast increase and tubular dilatation were much more prominent than in the other cases. The latter may in part be related to the strong therapeutic stimulation, as caffeine raises the glomerular capillary pressure, with a resultant increase in filtrate (Verney and Winton, 1930).

Aetiology of the Syndrome

Muscle necrosis is the one aetiological factor common to these cases and to those observed elsewhere. It was of limited extent in Case I, although comparison with the degree of necrosis in the other cases is difficult, since the leg was removed thirty-six hours after admission. It would seem of some significance that, in spite of amputation in this case, the time interval between injury and death was of the same order as in the others.

It is known that when muscle is injured its permeability increases and intracellular ions such as potassium leave it rapidly (Horton, 1930). This may be related to the early

increase noted in serum potassium. An evaluation of the relative importance of muscle injury, renal insufficiency, and possibly adrenal cortical deficiency in the composition of this biochemical picture must await the accumulation of further data.

Oliguria in shocked patients may be due to dehydration, sweating, and the fall in blood pressure (since a pressure below 75 mm. Hg is insufficient to produce urine in the absence of circulating diuretic substances—Winton, 1937). The fall in blood pressure lasted for one and one and a half hours only in Cases I and II. Such oliguria certainly facilitates the precipitation of relatively insoluble material in the tubules both in man (e.g., sulphapyridine calculi) and experimentally (e.g., haemoglobin, Yorke and Nauss, 1911). Another possible cause for anuria in air-raid casualties receiving sulphapyridine is the formation of calculi at the uretero-vesical junction (Sadusk *et al.*, 1940). None of these seemed to be of primary significance in the cases cited.

The part played by transfusion fluids (three of these patients received Group O blood as well as plasma and "serum") must be considered, inasmuch as the pathological changes resemble closely those of the "transfusion kidney." There was no evidence clinically of a transfusion reaction, although such can occur in the absence of one or, rarely, all of such symptoms as rigor, chill, backache, and jaundice. Plasma samples taken at seventeen and a half and forty hours after transfusion showed no increased colour. Further, although in Case I, before blood transfusion, haematuria and albuminuria were absent, the high blood urea and low urinary output suggested impairment of renal function. The case reported by Mayon-White and Solandt in this issue (p. 433), and six other cases of which we have heard, received no blood, but plasma or reconstituted serum only. Perhaps, however, the most potent argument against these being due merely to transfusion reactions is that no such condition has occurred in any of 25 shocked and injured patients without severe muscle crush treated in this hospital by blood or "serum" transfusion.

Treatment

The treatment of this condition so far has been by trial and error. It has been directed primarily to restoring urinary output by means of heat to the loins, by saline dilution of plasma protein (thus increasing the glomerular filtering force), by increasing blood volume with serum and hence blood pressure (thus increasing the glomerular capillary pressure), and by the use of diuretics such as caffeine. Decapsulation should perhaps be tried, as it has been shown to reduce the intrarenal pressure (Winton, 1937). In transfusion kidney this has been done twice with successful results (Bancroft, 1925; Younge, 1936).

The effect of adrenal cortical extract in this condition should also be observed, in view of the raised potassium. The development of electrocardiographic changes in Case I was not associated, however, with any significant alteration in serum potassium (cf. Thomson, 1939). In Case II the changes were similar to those seen in many patients a few minutes before death (Wood, personal communication). However, it is unknown whether changes in the heart muscle manifest electrocardiographically were concerned in the striking terminal collapse.

Prevention by early amputation was thought adequate in Case I; it is evident that thirty-six hours was not early enough. Whether there exists an alternative to immediate amputation we shall learn only by further and fuller investigation of such patients and by careful observation of the effects of treatment, or if the condition can be reproduced in the laboratory. Investigations which are designed to induce such a condition experimentally are already in progress at this institution.

Summary

Four cases of crush injury to limbs, producing shock, are described in which after recovery due to replacement of circulatory fluid the patients showed oliguria and pigment casts. They died in about one week with nitrogen retention. Necropsy revealed degenerative changes in the proximal convoluted tubules and pigment casts in the more distal part of the nephron. The aetiology and possible lines of treatment are discussed.

We are grateful to our colleagues engaged on shock research at the British Postgraduate Medical School for their co-operation and participation in this study—in particular to Prof. Dible and Dr. Thomas Belt, and to Dr. J. Clegg, who supplied the serum. Our thanks are also due to the Chief Medical Officer of the London County Council for permission to publish this report.

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A CASE OF CRUSH INJURY WITH RENAL FAILURE

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When a bomb demolished a hostel at 4 a.m. in January a young male leather-worker of 20, of medium height and good physique, was buried beneath the debris and his left leg was crushed against the side of an iron bedstead by a heavy metal girder. Morphine grain 1/4 and hot drinks had been administered and hot bottles applied to the trunk while attempts were made to extricate the man. When he was first seen at 1.30 p.m. the left leg was still trapped, his mental condition was apathetic, the extremities were cold, and no pulse was palpable at the wrists. He was finally released at 2.15 p.m., ten hours and fifteen minutes after the accident.

On admission to St. Thomas's Hospital the blood pressure was 110 mm. Hg systolic and 70 mm. diastolic, and the pulse rate 136 per minute. The haemoglobin concentration, determined by the Haldane method, was 150% (ear). He was pale and lethargic but not cyanosed, and complained of no pain. The left leg was swollen and

tense from six inches below to four inches above the knee-joint. There was no external wound of the limb, the pulsation of the dorsalis pedis and posterior tibial arteries was easily palpable at the ankle, and complete physiological interruption of the peroneal nerve appeared to be present. Physical examination revealed no further injuries. The temperature (mouth) was 97° F. on admission and rose rapidly to 99.6°.

During the first two hours after admission he vomited and his pulse rate tended to rise, while the haemoglobin concentration remained constant. He was therefore given 1,120 c.cm. of stored plasma in a hundred minutes. From this time onward the blood pressure began to rise, reaching 130 systolic and 88 diastolic twenty-four hours after admission, and 155 systolic and 100 diastolic on the third day. In spite of an adequate fluid intake the output of urine dropped from 650 c.cm. on the second day to 205 c.cm., by catheterization, on the third. At this time the patient was drowsy and occasionally vomiting small quantities. A loud systolic murmur was present at the apex, which was three and a half inches out in the fifth space. The left leg was swollen and tense from tip to ankle and showed pitting oedema. The pulse in both the dorsalis pedis and posterior tibial arteries was stronger on the injured than the uninjured side. A catheter specimen of urine was brown in colour, with a large dark brown sediment consisting chiefly of blood-pigment casts. *X*-ray examination disclosed a fracture of the tibia in the middle of the shaft without displacement. Venous blood at this time contained increased urea, potassium, and phosphate (see Table), and an electrocardiogram revealed slurring of the RST segment.

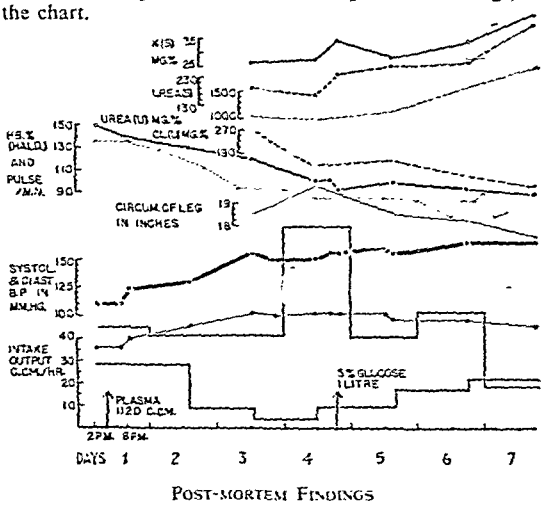
On the fourth day ineffectual vomiting continued. There was now no murmur at the apex. Swelling of the left leg above the knee had increased. The urine was a clear yellow fluid, and microscopically a rare blood-pigment cast was found. The benzidine test was negative. One litre of 5% glucose was given intravenously. After this, on the fifth day, the urinary output was 250 c.cm.; there was no sediment and the benzidine test was negative. The patient was still vomiting, drowsy, and slightly disorientated, but neither anxious nor apprehensive. The left leg had decreased in size. On the sixth day the patient seemed more alert and in good condition. The output of urine increased to 490 c.cm. and only an occasional pigment cast was present. There was less oedema of the thigh, but some pitting oedema had appeared in the right foot. The systolic pressure had risen to 165 mm. Hg and the diastolic had fallen to 95. After the first twenty-four hours the temperature had remained normal.

On the morning of the seventh day the patient complained of lack of fresh air. At 4 p.m., despite slight mental depression, he seemed quite well. At 6.15 p.m. he was still slightly disorientated, but both apprehensive and anxious. The nostrils dilated with inspiration, there were some cyanosis and marked stertor, and rales could be heard all over the chest. The heart rhythm was regular and the apex beat one inch further out. Both lung bases were dull to percussion. The venous pressure was not increased. Soon after the completion of catheterization the patient became intensely alarmed and broke into a profuse generalized sweat. The heart became grossly irregular; the pulse weakened but did not increase in rate. After an injection of morphine grain 1/4 and atropine grain 1/100 the blood pressure returned to 165 systolic and 90 diastolic within ten minutes; the pulse became regular. Thirty minutes after this recovery the patient was again alarmed by a sensation of imminent death; he began to sweat, the systolic blood pressure fell sharply from 155 to 135 and then to 30 mm. Hg; the pulse was irregular and he died in a few seconds.

Day	Serum						Urine					
	Urea mg. per 100 c.cm.	Inorg. P mg. per 100 c.cm.	Chlorides (as NaCl) mg. per 100 c.cm.	Protein gm. per 100 c.cm.	Potassium mg. per 100 c.cm.		Volume c.cm.	Protein mg. per 100 c.cm.	Urea mg. per 100 c.cm.	Chlorides (as NaCl) mg. per 100 c.cm.	Uric Acid mg. per 100 c.cm.	Benzidine Reaction
3rd	188	7.7	480	6.9	26	(2) (3)	205	80	1,050	258	28	Positive
4th	165	7.7	488	—	27	(3)	100	80	1,000	136	21	Negative
5th	235	6.7	525 (4)	6.4	34							
6th	270	6.7	515	6.4	28	(3) (5)	250	70	1,120	156	17	"
7th	278	8.7	432	—	34		490	60	1,580	103	16	"
8th	393	11.1	430	—	43		530	60	1,920	60	14	"
8th (1)	393	11.1	430	6.5	43	(6)						

(1) At death. (2) Fibrinogen 0.4 gramme. (3) Direct van den Bergh negative, bilirubin 0.8 mg. (4) Received 1,000 c.cm. saline. (5) Calcium 10.6 mg. (6) Uric acid 10 mg. Creatinine 4 mg.

The biochemical findings are recorded in the appended table and are shown graphically, in conjunction with the fluid balance, pulse rate, and blood-pressure readings, in the chart.



POST-MORTEM FINDINGS

Necropsy was performed sixteen hours after death. The macroscopic appearances were as follows: *Kidneys*—Swollen; the cortex was very pale and there were interrupted red streaks in it. The weights of the kidneys were: right 6 oz., left 8 oz. *Heart*—All chambers were full of fluid blood. Otherwise the heart appeared normal. Weight 12 oz. *Aorta*—The aorta was normal except for slight atheromatous change. No thromboses in iliac, femoral, or popliteal vessels. *Muscle*—The muscle in the left leg, in the crushed area, was pale and friable and showed a large number of haemorrhages. The main muscle groups affected were the peroneal group, soleus muscle, and the lower part of the vastus externus. There was a subperiosteal fracture of the left tibia. *Lungs*—Both bases were somewhat collapsed and the upper lobes showed petechial haemorrhages. The left lower lobe was completely collapsed and the bronchi were full of pus. *Liver*—Appeared normal macroscopically, though rather congested. *Spleen*—Small white areas were seen on the surface of the

spleen. These extended about 0.2 centimetre into the substance of the spleen. There was a small amount of perisplenitis on the area in contact with the kidney. *Suprarenals*—No obvious macroscopic change. *Stomach*—Very congested. Appearance of acute gastritis. No definite ulceration. *Pancreas*—Appeared normal. *Intestines*—Normal. *Bladder*—Normal. *Rectum*—Normal. *Thyroid and parathyroid glands*—Normal. *Brain*—There were a number of small (?) cystic spaces in the left posterior cerebrum. These did not appear to have any acute origin. *Pituitary*—Appeared normal. No bony damage to the skull.

HISTOLOGICAL FINDINGS

The following tissues were examined histologically: kidney, lung, liver, spleen, myocardium, pancreas, brain, stomach, voluntary muscle of leg, adrenal, thyroid, and pituitary.

Renal Changes.—The most important changes were those found in the kidneys. In these there were slight oedema of interstitial tissue and changes in the glomeruli and tubules.

The glomeruli: The capsular space was distended by material stained pink with eosin. In the majority of glomeruli this material formed either a net or a net together with a little granular material; in other glomeruli the material was globular, the masses often being about the size of erythrocytes.

Tubules: The majority of the tubules throughout the cortex and in the medulla contained material similar to that found in the glomeruli. In many tubules in both cortex and medulla there were casts of granular brown material, and in some a few clumps of erythrocytes.

In frozen sections no trace of fat was found either in the tubules, cells, or capillaries. These sections did, however, show that the pink material in the tubules and glomeruli filled the spaces more completely than it appeared to do in the paraffin sections. Many stains were tried in an attempt to identify the material in the tubules and glomeruli, but without success apart from a positive stain for fibrin (Weigert's fibrin stain). The material giving a positive stain appeared only in the distal part of the tubules and never in the glomeruli in this kidney. The brown material did not give a positive reaction for free iron.

Other Organs.—Spleen, myocardium, pancreas, adrenal, thyroid, and pituitary were all normal. The lungs contained focal haemorrhages, patches of oedema, and slight acute inflammatory infiltration. The liver showed parenchymatous degeneration and also oedema in the region of the portal systems with dilated lymphatics. In the stomach there were minute haemorrhages in a congested mucosa. In the brain there was a little old and recent haemorrhage in wide perivascular zones in the white matter beneath the cortex in the left temporal lobe. In the voluntary muscles of leg histiocytic reaction was found in the periphery of degenerate partly calcified muscle bundles from the thigh.

Our thanks are due to Mr. W. H. C. Romanis for permission to publish this case.

Although the activities of the National Smoke Abatement Society have had to be limited owing to the war, it has been found possible to continue some of the work and to issue publications, and the financial position is satisfactory. After a meeting held at Manchester the executive committee put forward a comprehensive resolution pointing out that in view of the need to eliminate all forms of waste, attention ought to be directed to the gross and expensive waste causing and caused by the smoke nuisance—a waste not only of fuel and power, and of money, labour, and skill, but of health and amenity; the society viewed with anxiety the deterioration in atmospheric conditions which had occurred during the war. The intensification of the war, however, soon after this resolution was framed, prevented any considerable action upon it or any campaign on the ground of fuel economy against industrial smoke. The president of the society is Dr. H. A. des Vœux, and the British Medical Association is represented on its council by Dr. G. Clark Trotter and Mr. Bishop Harman. The society's eleventh annual report has just been issued.

A CASE OF LIMB COMPRESSION ENDING FATALLY IN URAEMIA

BY

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(From the S.W. London Emergency Blood Supply Depot)

In this issue of the *Journal* (p. 427) Bywaters and Beall report four cases of renal failure in air-raid casualties, three of which received blood transfusion. The pathology of these cases is very similar to that resulting from incompatible blood transfusion. The following case is reported because, though it is clinically similar to and in its essential pathology identical with the cases of Bywaters and Beall, there is the vital difference that blood transfusion played no part in its treatment.

Case Report

A girl aged 11 was pinned under bomb debris for about three hours on a night of October. Members of the rescue party stated that she was lying on her right side, body tilted head downwards at an angle of 45 degrees, the legs acutely flexed at hips and knees. In this position she was compressed, though not actually crushed, by the dead bodies of her parents; a heavy beam lay upon her left thigh.

On admission to hospital she was conscious and rational as she had been all the time rescue work was proceeding. Though rather pale and complaining of pain in both legs, she seemed comparatively unhurt. Full examination revealed no evidence of injury save some swelling of the left thigh. The blood pressure was not taken, but the pulse was said to be of normal rate and fair tension. During the early morning she passed 4 oz. of smoky red urine which was said to have given a positive result to the tinct. guaiac. test for blood. Radiography showed no evidence of bone injury. The swollen thigh was thought to be due to a deep-seated haematoma from injured muscle.

Next night she was first seen by one of us (O. M. S.). She presented a typical picture of uraemia. She was drowsy and irritable, her skin was dry, her respiration deep and sighing. Her mouth was dry, the tongue covered with brown fur, and the lips cracked. The left thigh was very much swollen, pitting oedema extending from the hip to the toes. The greatest swelling was in the thigh; there was no discoloration of the skin to suggest an underlying haematoma. The left arm was also oedematous. During the next five days the oedema increased and spread till the whole body below the level of the nipples showed pitting on pressure; the swelling was always greater on the left than on the right side. There was no oedema of the face. The patient was nursed throughout in a semi-sitting position, this being the only one she would tolerate. The bladder was never palpable. There was complete anuria save for a few cubic centimetres passed incontinently on the nights of October 30 and 31. Attempts to collect a specimen of urine by catheterization proved the bladder to be empty.

Her condition progressively deteriorated. She became more and more irritable, being much troubled by thirst and by her inability to move her oedema-bound legs. She remained conscious, though increasingly stuporous, until an hour before her death. She died at 4.30 p.m. a week after admission. At no time was the patient jaundiced, nor was there an icteric tinge to the plasma of any blood sample taken for haematological readings.

Treatment.—In an endeavour to cause a diuresis 3,000 c.c. of 5% glucose in normal saline was given by intravenous drip over a period of thirty-six hours from October 29 to 31. In view of the increasing oedema and decreasing fluid

proteins (from 6.4 to 4.8—see table), and since no diuresis had ensued, this was abandoned. Mersalyl 1 c.cm. was injected intramuscularly on October 31, and a similar dose intravenously on November 2.

Table Correlating the Treatment, Blood Pressure, Urine Excretion and Blood Estimations

Date*	Blood Pressure	Blood Urea mg. per 100 c.cm.	Hb %	Haematocrit (% R.B.C.)	Plasma Protein gm. per 100 c.cm.	Treatment	Urine Output
Oct. 28	—	—	—	—	—		4 oz.
,, 29	132/100	154	124	54.0	6.4	3,000 c.cm. 5% glucose-saline	Trace
,, 30	125/90	210	94	42.0	4.8		,,
,, 31	140/100	295	—	—	—	100 c.cm. 4×N serum	None
Nov. 1 (a.m.)	140/100	295	98	42.5	4.3	400 c.cm. 4×N serum	,,
(p.m.)	140/110	309	90	40.0	4.9		
,, 2	150/110	327	88	39.5	4.3		,,
,, 3	145/110	369	76	35.5	4.6	200 c.cm. 4×N serum	,,

To raise the plasma proteins and because of its diuretic action (Anderson and Boyle, 1940) concentrated human serum was given intravenously. The serum used was the dried serum supplied by the Medical Research Council's serum-drying unit. It should perhaps be emphasized that the serum from Group A (II), B (III), and AB (I) donors is pooled before filtration and drying, and that the effect of this pooling is to render the agglutinin content negligible (Levinson and Cronheim, 1940). A solution of four-times-normal concentration was made. Intravenous injection of 100 c.cm. on October 31, and 400 c.cm. (by intravenous drip) on November 1, produced a rise of plasma protein from 4.3 to 4.9. Coincidently the patient seemed more comfortable. A further infusion was started at 11 a.m. on November 3. 200 c.cm. had been administered by the time she died. (On this last occasion 0.5 gramme of evipan intravenously was necessary to restrain the patient while the cannula was inserted. Anaesthesia lasted twenty minutes. On November 1 sodium amytal grains 1½ by mouth was sufficient.) No reaction was caused by the serum. The patient's temperature remained subnormal throughout her stay in hospital.

Pathology

The post-mortem examination was performed by Dr. J. V. Dacie. The chief findings were as follows:

General: Symmetrical oedema of body from nipples to feet. Arms oedematous below mid-point of humerus.

Thorax: No excess of fluid in pleural cavities. Slight excess of clear fluid in pericardium. Heart normal. Fluid blood in great vessels.

Lungs: Pale and bulky. Slight basal congestion (detached portions floated in water).

Abdomen: Slight excess of peritoneal fluid. Stomach, liver, spleen, and mesentery normal. Considerable injection of the mucous membrane of the bowel from the duodenum to the sigmoid colon. Kidneys large and pale, foetal lobulations well marked. On section the kidney cortex seemed paler than normal. The differentiation between cortex and medulla was very clear. The capsule stripped readily. Ureters normal, bladder empty. No other abnormalities were found.

Thigh muscles: Oedematous but otherwise normal. No extravasation of blood, no microscopical evidence of necrosis.

It is the microscopical appearance of the kidney that is the chief point of interest in this case. Most of the tubules contained a granular debris that stained a brick-red colour with eosin. This material could be found in all parts of the tubule from the capsular space to the duct of Bellini. Proximally it was small in amount and was often embedded in an albuminoid substance, but in the collecting tubules the granules were tightly packed, forming a solid cast of the lumen. At first sight some of these granules seemed to be red blood corpuscles; on closer inspection and comparison with intact corpuscles in the vessels it was evident that the tubular contents were frankly granular, though "ghosts" of broken cells could be seen in some places. In an unstained section the tubular contents were the golden-red colour of unstained red cells. The tubular epithelium in some places showed evidence of degeneration. Some of the cells had lost their outline. There were some pyknotic nuclei. This degeneration seemed to bear no constant relation to the amount of material in the tubule. The glomeruli were normal; the capsular space was not dilated. Special staining showed no fat and no free iron in the kidney substance or in the tubules.

Summary

The case is reported of a patient who died from uraemia following a type of injury that often produces shock. The micropathology resembles that of incompatible transfusion. Unlike similar cases reported in this issue there can be no possibility here of incompatible transfusion, since no blood was given to our patient. Herein lies the importance of this case and the reason for reporting it.

We wish to thank Dr. A. T. Moon for allowing us access to his patient and Dr. J. V. Dacie for performing the necropsy and preparing sections of the kidney and other organs

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ANTIBODY RESPONSE AND SYSTEMIC REACTIONS AFTER INOCULATION OF A NEW TYPE OF T.A.B.C. VACCINE

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An account was given in last week's issue (p. 391) of the experimental work that led to the preparation of a new type of typhoid vaccine killed and preserved with alcohol. The object of the present paper is to record the results of comparative trials in man, carried out with the new and the old types of vaccine. Observations were made on the local and general reactions produced by the inoculations, and the immunity response was measured by the estimation of the Vi and O antibody content of the sera.

From the experiments described in the preceding paper it seemed justifiable to expect that alcohol-killed and alcohol-preserved vaccines would stimulate Vi antibody response in an outstanding manner and could, by this property, be distinguished from ordinary heat-killed and phenolized vaccines. To test this point, and also to ensure the unbiased reading of the agglutination tests, the first three trials were so arranged that the samples of serum reached one of us (A. F.) labelled only with serial letters and numbers, without indicating which of the vaccines tested had been used for the inoculation of any particular group of volunteers. It will be seen from the following tables that in each of the three trials the group

suspended in buffered formalin–saline solution (Felix and Gardner, 1937). The sensitiveness of the suspensions was in each test checked against standard O agglutinating sera. The serum samples from the naval recruits were tested independently by two of us (S. G. R. and A. F.), using the same batches of suspensions and standard sera and the same technique. Thanks to this precaution the results obtained by the two observers were in good agreement.

The following serum dilutions were tested for O antibodies against the various suspensions:

Bacterial Suspensions	Sample of Serum taken before Inoculation	Sample of Serum taken after Inoculation
Bact. typhosum	1 : 50 1 : 100 1 : 200	1 : 50 1 : 100 1 : 200 1 : 500 1 : 1,000 1 : 2,000
Bact. paratyphosum B		
Bact. paratyphosum A	1 : 25 1 : 50 1 : 100	1 : 25 1 : 50 1 : 100 1 : 200 1 : 500 1 : 1,000
Bact. paratyphosum C		

In order to detect even a very slight increase in O antibody content the titre was assigned to the highest dilution of the serum which showed a "last trace" reaction, visible by means of a magnifying lens. Any difference in titre between the two corresponding samples of serum that amounted to one dilution in the series tested—i.e., an increase of 100%—was taken as "significant." With this very sensitive method of measurement the high figures of "significant" reactions that have been recorded in Tables I, II, and III were obtained.

No attempt was made to express the degree of antibody response in terms of average titres observed in the various groups. It is well known that the ability of different individuals to produce high-titre agglutinins varies over a very wide range. Groups comprising much greater numbers than those tested in these trials would be needed to counteract the effect of individual differences and to produce statistically significant figures. Most of the titres observed with the two sensitive suspensions TO and BO varied from 1 in 100 to 1 in 500, only very few reaching or exceeding a titre of 1 in 1,000. With the less sensitive paratyphoid A and C suspensions the O titres usually varied from 1 in 25 to 1 in 100, and very rarely reached or exceeded 1 in 200.

The readings of the O agglutination tests were taken after two hours' incubation at 37° C., and a further twenty-two hours at room temperature. It was found that O agglutinins of titres as low as those occurring in the serum from inoculated subjects do not withstand prolonged heating at 50° to 52° C., the temperature usually employed for incubating diagnostic agglutination tests. It is known from earlier work (Eisenberg, 1906) that diluting the serum increases the heat resistance of agglutinins, and this is of particular importance in the case of the O agglutinins, which are less resistant to heat than H agglutinins (Felix and Olitzki, 1929). Many of the O reactions recorded in Tables I, II, and III as positive would have been missed had incubation at 50° to 52° C. been employed.

Technique of Typhoid Vi Agglutination Tests

The Vi agglutination tests were carried out with a batch of suspension prepared by Lieut.-Colonel R. F. Bridges at the Standards Laboratory, Oxford, using the sensitive strain Vi I of Bhatnagar (1938). The agglutinability of the suspension was checked against the provisional standard serum which was described in connexion with the standardization of therapeutic anti-typhoid serum (Felix, 1938). It was soon found, however, that the standard of agglutination chosen in that work, and employed also in diagnostic Vi tests to indicate the Vi titre of a serum, was too high for the measurement of Vi antibodies of titres as low as those induced by T.A.B.C. inoculation. A lower standard had therefore to be adopted for the purposes of this investigation. This was chosen at half the original value, so that the standard agglutination which determined the Vi titre was that occurring in the dilution 1 in 1,200 of the provisional standard serum. The degree of this reaction with the suspension that was employed throughout this investigation was a full reading estimated with the naked eye.

The two corresponding samples of serum taken from eac volunteer before and after inoculation were tested against th Vi suspension in the dilutions 1 in 10, 1 in 20, 1 in 40, an 1 in 80, and any increase in titre of 100% or more was cor sidered as "significant." In the series of 227 naval recrui recorded in Table III 34 significant Vi reactions were foun The following titres were observed: 15 had titres of 1 in 1(11 of 1 in 20, 7 of 1 in 40, and 1 of 1 in 80.

Local and General Reactions

The reactions following the administration of th alcohol-killed and alcohol-preserved vaccine were com pared with those produced by the other batches of vaccin employed in the trials. Notes were made separately o the reactions following the first and second doses o vaccine. Records were kept of temperature readings take during the first two days after the injections and of th occurrence of any of the symptoms that are associate with T.A.B. inoculations. Under local reactions th diameter of erythema and the degree of tenderness wer recorded, and special attention was paid to involvemen of axillary glands and to any serious complaints o inability to use the arm.

In the course of the three trials described in the pre ceding sections, and in a few others not hitherto mentioned about 140 adults were given alcohol-killed and alcohol preserved vaccine in doses of 0.5 and 1 c.cm. About 10(of the inoculated were men and 40 were women, including 20 nurses. It was soon found that the reactions produced by the new type of vaccine differed in two respects from those caused by ordinary vaccine.

(i) *General Reactions.*—There was a remarkable absence of severe general reactions. Temperatures over 99° F. were recorded in a number of cases within twelve to twenty-four hours, especially among the female volunteers, but the slight malaise was transient and did not cause the nurses to go off duty.

(ii) *Local Reactions.*—The injection is felt as a sting lasting for a fraction of a minute. This is due to the alcohol contained in the vaccine. The early local reactions, consisting of erythema and swelling, were similar to those produced by ordinary T.A.B. vaccine, though they were usually milder and rarely involved the axillary glands. As a rule there was no pronounced muscular stiffness and the arm could be used freely. The inoculated naval ratings, for instance, did not require to be excused duty, which included physical training. The redness and swelling persisted for two or three days and then subsided rapidly, but a small palpable nodule was left in most cases, and this persisted for about ten days before passing off gradually. In some cases the nodule, about the size of a split-pea, could still be felt after three weeks.

In 3 cases out of 140 that were given the customary large doses of vaccine the local reaction has been different— in 1 male and 1 female after the first dose (0.5 c.cm.) and in 1 male after the second dose (1 c.cm.). In these cases there was some local induration, which appeared about the fourth day after the injection and by the sixth day had developed into a small fluctuating area at the site of the injection. This delayed local reaction was not accompanied by any general reaction, did not interfere with the free use of the arm, and disappeared spontaneously in the course of two or three weeks.

The alcohol-killed and alcohol-preserved batches of T.A.B. and T.A.B.C. were the only vaccines that produced the subcutaneous nodule. The vaccine which was killed by alcohol but suspended in saline containing 0.5% phenol (see batch P in Table III) produced both general and local reactions of the type seen after inoculations of ordinary heat-killed vaccine. There can be little doubt, therefore, that the alcohol that is injected with the vaccine is in

some way responsible for the modified reaction. Rabbits inoculated subcutaneously with alcoholized vaccine develop similar nodules. It is possible that histological examination will suggest an explanation of how alcohol and bacterial toxins, when contained in the vaccine, combine to produce the lesion. The absence of more severe general reactions is probably due to the fact that the absorption of toxic substances from the bacterial bodies is delayed as a result of the action of alcohol.

Antibody Response and Severity of General or Local Reactions

Some workers hold the view that the severe reactions that occur after inoculations with ordinary T.A.B. vaccine are of value in enhancing antibody production and thus are not wholly a disadvantage. Ramon's (1926) method of producing artificial sterile abscesses in horses undergoing immunization in order to increase the amount of antitoxin in their blood is sometimes quoted in support of this view. It has been mentioned already that according to Bensted (1940a) ordinary T.A.B. vaccine occasionally stimulates a certain amount of Vi antibody, though it is demonstrable only during a very short period after the inoculation. Bensted found such results solely in men who had suffered from a very severe reaction after receiving a dose of ordinary T.A.B. vaccine.

We have searched very carefully for a possible correlation between Vi antibody response and severity of general or local reactions but have failed to detect any evidence of such correlation. Tables II and III show a few instances of a significant Vi antibody response in subjects inoculated with different batches of heat-killed vaccine. The persons who had these significant Vi titres were, however, not among those who had developed the most severe general or local reactions. The numerous significant Vi reactions that were found amongst the volunteers inoculated with alcoholized vaccine also did not suggest any relation between typhoid Vi antibody and severity of reactions. The same was true with regard to the titres of O antibodies against the four bacterial species tested. Nor was there any constant relation between significant Vi titres and high O titres, or between high O titres for one particular bacterium and those for one or more of the other types.

It seems therefore to be safe to conclude that the severe reactions caused by the ordinary T.A.B. vaccine are not only undesirable, for a variety of quite obvious reasons, but are of no value as a factor contributing to good immunity response. It has been shown in Tables II and III that the alcoholized vaccines, which produced the subcutaneous nodule, were in respect of O antibody formation not superior to any of the other vaccines. It has not yet been established whether the presence of the nodule has any effect on the persistence of demonstrable O or Vi antibodies. This point is now being investigated.

Experiences with Smaller Doses of the New Vaccine

Those who have had personal experience of T.A.B. inoculation of large groups of civilians have long formed the opinion that the doses of 0.5 and 1 c.cm. of vaccine of the usual strength that are employed as standard doses for members of the armed Forces are too large for the less robust average adult civilian. Even half these doses may cause severe reactions, as has been recently stated by Bensted (1940b). Reduced doses of vaccine, carefully graded according to age, sex, body weight, and physical condition, must be employed in the mass inoculation of the civilian population if unduly severe reactions are to be avoided.

Very few data have been published to show the effect on antibody response of reducing the dose of T.A.B. vaccine. Henderson Smith and Brooks (1912) showed that, up to a point, antibody response increased with increase of antigen. More recently Topley (1930) demonstrated in experiments with paratyphoid B bacilli in rabbits that a relatively large increase in the dose of antigen administered resulted in a relatively much smaller increase in the amount of antibody produced. Since, however, these experiments were concerned only with H agglutinins, the results are not necessarily applicable to O or Vi antibody response following administration of T.A.B. vaccine. Our own observations so far consist only of two preliminary trials on small groups, while comparative trials on a larger scale are at present in progress. The results of the preliminary tests, for what they are worth, are illustrated in Tables V and VI.

TABLE V.—*Showing Effect on O and Vi Antibody Response of Reducing the Dose of Vaccine*

T.A.B. Vaccine Batch No. 2 Killed and Preserved with Alcohol			Interval between 1st and 2nd Injections	No. Inoculated	Percentage Frequencies of Significant Increase in Agglutinin Titres 10 Days after Second Dose			
Stored at 1° to 2° C. for	1st Dose (c.cm.)	2nd Dose (c.cm.)	(Days)		TO	BO	AO	Typhoid Vi
6 months	0.5	1	10	22 adult males	90.9	90.9	59.0	22.7
"	0.25	0.5	14	20 adult females	70.0	75.0	50.0	20.0

The two groups recorded in Table V consisted of adult mental patients. It will be seen from the table that the reduction of the doses to half the amount was followed by a noticeable drop in O antibody response. The low figure for the Vi antibody showed no significant change.

TABLE VI.—*Showing Effect on O and Vi Antibody Response of Reducing the Dose and Prolonging the Interval between the Injections*

T.A.B.C. Vaccine Batch A Killed and Preserved with Alcohol			Interval between 1st and 2nd Injections	No Inoculated	Percentage Frequencies of Significant Increase in Agglutinin Titres 14 Days after Second Dose			
Stored at 1° to 2° C. for	1st Dose (c.cm.)	2nd Dose (c.cm.)	(Weeks)		TO	BO	AO	Typhoid Vi
3 months	0.5	1	1	5* adult males (naval ratings)	84.2	87.7	84.2	40.3
6 "	0.2	0.4	2	19 adult females (nurses)	57.9	57.9	36.8	36.8
6 "	0.2	0.4	3	20 adult females (nurses)	90.0	75.0	75.0	35.0

The first group recorded in Table VI is identical with the fourth group shown in Table III, and has been included here for purposes of comparison. The table shows that the reduced doses given at two weeks' interval produced a much lower O antibody response than the full doses at one week's interval. The response was greatly improved by increasing the interval between the injections from two to three weeks. Again there was no significant difference in the figures for the typhoid Vi antibody.

These results seemed to indicate that the doses cannot be reduced drastically without a corresponding decrease in the immunizing effect produced, but that, up to a point, the effect of decreasing dosage can be counterbalanced by increasing the interval between the injections.

So far, reports have been received on the reactions observed in about 250 adult females and 150 adult males who were given reduced doses of the alcoholized T.A.B.C. vaccine. Adult males received 0.25 c.cm. of vaccine

followed by 0.5 c.cm., and adult females had 0.2 c.cm. followed by 0.4 c.cm. Among 210 inoculated nurses only 3 had to go off-duty after the first dose of vaccine, none after the second dose. No case of delayed local reaction was observed amongst the 400 subjects who had been inoculated with the reduced dose of vaccine.

Suggested Doses and Recommendations for the Administration of the Alcoholized Vaccine

The alcoholized T.A.B.C. vaccine is equivalent in composition and total bacterial count to the customary vaccine—i.e., it contains 1,000 million *Bact. typhosum* and 500 million each of *Bact. paratyphosum* A, B, and C per c.cm. The following doses of this vaccine are recommended:

	First dose	Second dose
For adult males	0.25 c.cm.	0.5 c.cm.
For adult females	0.2 ,,	0.4 ,,
For children (male or female):		
From 16 to 18 years	0.2 ,,	0.4 ,,
,, 13 to 15 ,,	0.1 ,,	0.2 ,,
,, 9 to 12 ,,	0.05 ,,	0.1 ,,
Under 8 ,,	0.05 ,,	0.05 ,,

These are maximum doses and should not be exceeded: the next smaller dose in the series is advised for subjects in each category who are below average in physical vigour or development.

The interval between the two injections should be three weeks. If this cannot be adhered to and the choice is, say, two weeks or four weeks, it is preferable to choose the longer interval. Revaccination is advisable one year after the primary immunization: a single dose of the size of the first dose mentioned above is sufficient.

General reactions—i.e., languor with slight fever—are as a rule either absent or quite trivial after the small doses of vaccine. If the precaution is taken to make the injections as late as possible in the day—preferably not earlier than six hours before bedtime—any general reaction will go unperceived and only a very small proportion of inoculated subjects will find themselves unfit for work on the following morning.

The local reaction is hardly ever of such a degree as to prevent free use of the arm. This is equally true of the delayed reaction mentioned previously, which was observed in 3 out of 140 subjects who had been given the large dose of vaccine. So far this type of local reaction has not yet been seen in any subject who received the reduced dose of vaccine. It is to be expected, however, that certain persons who are especially susceptible may develop a small fluctuating area even after the injection of a small dose. No treatment of any kind is necessary or advisable for such a local reaction. It is nevertheless emphasized that the quantity of vaccine injected as the second dose must not be increased in these cases. Such susceptible subjects should receive as their second dose only half the quantity of vaccine injected as the first dose.

Summary

A new type of typhoid-paratyphoid vaccine, killed and preserved with alcohol, was compared with ordinary heat-killed T.A.B. or T.A.B.C. vaccine from various sources. Two marked differences were found between groups of subjects inoculated with the two types of vaccine: (1) The alcohol-killed and alcohol-preserved vaccines stimulated demonstrable typhoid Vi antibodies in a relatively high proportion of cases, whereas the Vi antibody response to ordinary vaccines was almost negligible. No significant difference in O antibody response was observed. (2) The reactions produced by the alcoholized vaccine were much milder than those caused by ordinary vaccine. General reactions were as a rule either absent or quite trivial. The local reaction was of a modified type and hardly ever prevented free use of the arm.

No correlation was found between Vi or O antibody response and severity of general or local reactions.

Recommendations are made with regard to the dose of vaccine and the interval between the two injections.

This investigation was made possible by the co-operation of Air Vice-Marshal H. E. Whittingham, Director of Hygiene, Air Ministry; Captain M. O. D. Ellwood, D.S.O., R.N.; Surgeon Commander T. G. B. Crawford, M.B., R.N., and his staff; Prof. H. P. Himsworth of University College Hospital Medical School; Dr. Nora Archer of the City Isolation Hospital, Headington, Oxford; Dr. M. L. Rosenheim and Dr. J. F. Stokes of University College Hospital, London. We are glad of this opportunity of thanking all of them for their help and the many volunteers for their kindness.

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Clinical Memoranda

An Unusual Injury to the Larynx

The injury in the following case seems to be unusual enough to be worth recording.

CASE REPORT

One night during the black-out a constable, after leaving a brightly lit police station, collided with a pillar-box in the street. The upper edge of this obstruction struck him on the thyroid cartilage. At once he experienced pain in the front of the neck and his voice became husky. The degree of huskiness gradually increased, reaching a maximum four hours after the accident. The next day his voice was still very rough, and there was tenderness to the left of the laryngeal cartilages. An examination of the larynx revealed the presence of a sausage-shaped haemorrhage under the mucosa of the left ventricular band. This haematoma almost completely obscured the view of the left vocal cord, though the extreme edge of this structure became visible when the cords were in full adduction. The possibility of a recurrent laryngeal nerve lesion was eliminated by the fact that both cords moved normally. The condition remained stationary for four days and then gradually improved. On the following day—that is, five days from the infliction of the injury—the voice still sounded deeper than usual. The haematoma was much decreased in size and the ventricular band looked purplish and swollen, but the vocal cord was clearly visible. It took twelve days for the voice to become quite normal, and in eighteen days all signs of the injury had disappeared.

Commentary.—Fatal and non-fatal cases involving injury to the neck are relatively common in police work. This particular case seems to emphasize the necessity for examining the interior of the air passages in all non-fatal medico-legal cases involving injury to the neck. Very often the assaulted person complains of pain and tenderness near or over the larynx, but apart from the tenderness that can be discovered externally there may be no concrete clinical findings that will serve as indisputable proof of injury received. Marks of finger-nails and bruising may be found externally; but this is not invariable, and the bruising may take several days to appear on the surface. In all such cases, therefore, a laryngeal examination might prove valuable.

GILBERT FORBES, M.B., F.R.F.P.S., F.R.C.S.Ed.,
Police Surgeon, City of Sheffield;
Lecturer in Forensic Medicine,
University of Sheffield.

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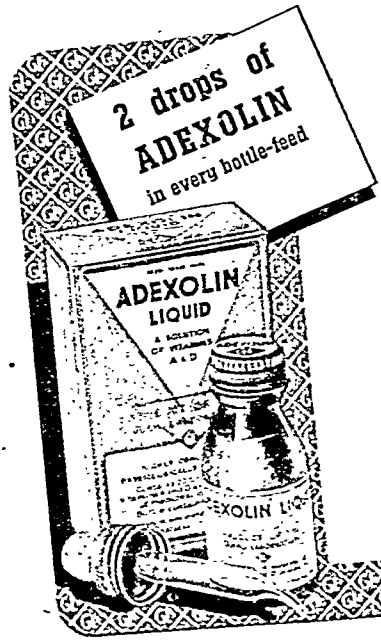
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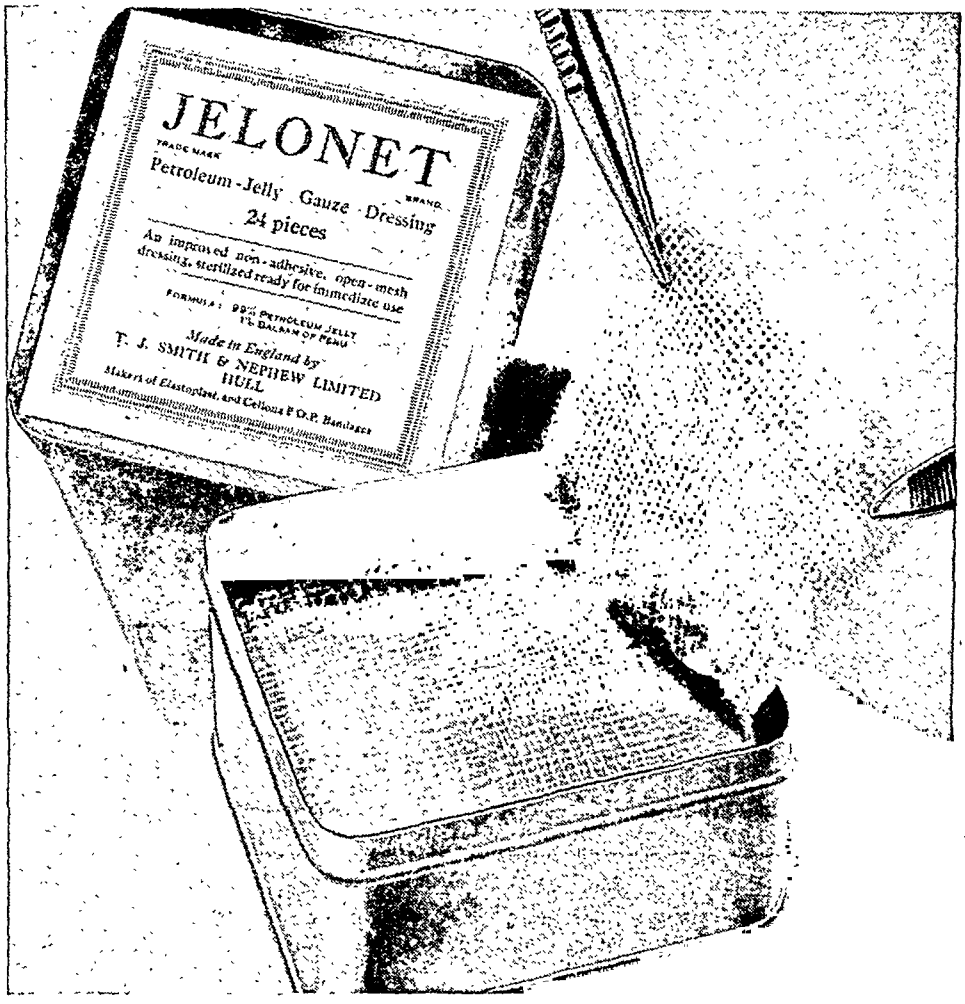
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An Advanced Case of Cerebrospinal Fever

Remarkable recoveries from cerebrospinal fever are often observed with modern methods of treatment. The following account of a case of unusual severity may be of interest because the patient was completely restored to health although he had been moribund and paralysed for a considerable period.

CASE HISTORY

On May 28, 1940, an Italian café proprietor aged 42 was admitted to hospital. For ten days before admission he had a severe headache, with pyrexia on the third day, and for two days before admission he was comatose.

On admission the patient obviously was desperately ill. The respirations were Cheyne-Stokes in character, the rate being 28. There was no fever. Pronounced neck retraction and a right-sided hemiplegia were present. Lumbar puncture showed the cerebrospinal fluid pressure to be 260 mm., and 20 c.cm. of thinly turbid fluid was withdrawn from which meningococci were cultivated.

Sulphapyridine was given immediately. The dosage is shown in the accompanying table. After twelve hours the

Table of Treatment

Day	Sulphapyridine gm.	Serum c.cm.	C.S.F. Pressure	Vitamin B_1 mg.	Condition
0			260 t.		Bad
1	9	25 B. & W.	260 f.		
2	8	25 "	260 t.		
3	8	30 M. "			
4	6	30 "		10	
5	6	30 "	150 c.	10	
6	4	30 "		10	Critical
7	4	30 "	150 c.	10	
8	6	30 "		10	
9	6	30 "		10	
10	6	30 "		10	
11*	6	30 "		10	
12	3	30 "		10	Improvement
13	3			10	
14				10	

B. & W.=Burroughs and Wellcome. M.=Mulford. t.=turbid. f.=flocculent. c.=clear. * Blood transfusion.

patient was even worse, and a further lumbar puncture was performed. The pressure was again 260 mm., and 10 c.cm. of fluid was removed; this time it was flocculent. Fluids were administered intravenously, as the man was very dehydrated and it was considered that this fact might be contributing to his grave condition. On May 29 daily intramuscular injections of anti-meningococcal serum were begun, being continued for the next eleven days. Vitamin B_1 was injected daily in doses of 10 mg. for about three weeks, when the dose was diminished to 2 mg.; this treatment was continued until full recovery occurred. The frequency with which lumbar puncture was performed is shown in the table. On the fifth day after admission the cerebrospinal fluid pressure was approximately normal and the fluid was clear.

By the end of the first week of his stay in hospital the patient showed no sign of return of consciousness and the respirations were still grouped; a few days later he developed bronchopneumonia. During the second week, while the temperature, pulse, and respirations were still raised on account of the chest condition, indications of improvement were observed: at times during the day he would take notice of what was going on around him. It was considered that recovery might be encouraged if he were given a blood transfusion. Accordingly 500 c.cm. of fresh blood was administered, following which daily improvement was observed. Some days before he began to talk his sense of humour returned. He now became aware of his incontinence, and this was the first step towards its control; then the plantar response on the right side became flexor and the leg showed signs of returning function. The hand was the first part of the upper limb to manifest improvement, and a week later the shoulder muscles, encouraged by massage, followed suit. After six weeks he could walk with help and sign his name with a rather childish hand. When last heard of he was completely restored to his normal health.

I am indebted to Drs. A. C. Hampson and W. S. Hunt for permission to publish this case.

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Pulmonary Tuberculosis in Soldiers

The admission of men with pulmonary tuberculosis to the Army is of extreme importance from both the economic and the hygienic points of view, and therefore analysis of the data from the first 100 cases personally examined and "boarded" out of the Army may be of interest, especially in regard to evidence of disease previous to entry and likely factors in causing promotion or exacerbation of symptoms.

The age incidence in this series was: 9 patients under 20 years, 78 from 20 to 30, 9 from 30 to 40, and 4 over 40. Of these, 22 gave a history of active pulmonary tuberculosis in members of the immediate family circle—mother, father, brother, sister, or wife.

There was clear evidence that 18% had been in sanatoria and 15% more were suffering from the disease previous to admission to the Army. In 41% the condition was manifest within a month of recruitment, another 11% within three months, 16% in six months, 16% within a year, and only 16% first showed symptoms after a year. The value of medical supervision and weight recording in the first three months of Army life is therefore obvious. Cooper (1940) says that 5% of recruits to the 6th Division of the A.I.F. were turned down by medical boards on account of phthisis and that another 0.9% were later discovered by microradiography, of which over half appeared to be active. These figures bear out the importance of the recommendations of the Committee of the Ministry of Labour and National Service (1940), presided over by Lord Horder, that (1) medical boards should obtain from recruits a signed statement that to their knowledge they have never suffered from pulmonary tuberculosis; and (2) that district medical officers of health should (*a*) furnish all men likely to be called up, and known to be suffering from phthisis, with a certificate to that effect, and (*b*) notify the Ministry of Health of this fact, so that medical recruiting boards might have this information before them.

Analysis of the clinical records of the 100 cases shows that 15 had a definite past history of pleurisy and that in 22 the onset of the condition was made manifest by an attack of pleurisy. In 27 haemoptysis was the first symptom, in 29 cough, in 16 general symptoms of lassitude, loss of weight, etc.; in 7 the onset was acute and was first mistaken for pneumonia, and in 3 the main symptoms were gastric, the cases being sent up to the medical specialist clinic as suffering from peptic ulcer. In addition 1 came under attention with tuberculide, 1 with ischio-rectal abscess, and 1 was diagnosed when admitted for acute appendicitis. When medically "boarded" out of the Army 42 of the men had bilateral and 41 unilateral infection, the right lung being affected slightly more often than the left. In 48 of 78 cases the sedimentation rate was definitely increased, and in only 2 cases in which the sputum was loaded with tubercle bacilli was the sedimentation rate under 10 mm. Westergren at the end of one hour.

Factors in causation suggested by the men were: prolonged exposure to severe weather and damp, 32; heavy work and lack of sleep, 32; poor ventilation due to black-out and housing difficulties, 14; and difficulty in obtaining adequate food (in Belgium), 10. 31 of the men could find no exception to any condition under which they had had to work.

G. D. KERSLEY, M.D., M.R.C.P.,
Major, R.A.M.C.

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Reviews

BOVINE TUBERCULOSIS

Man's Greatest Victory over Tuberculosis. By J. Arthur Myers, Ph.D., M.D., F.A.C.P. (Pp. 419; illustrated. $5.00 post paid or £1 7s. 6d.) Baltimore: Charles C. Thomas; London: Baillière, Tindall and Cox. 1941.

A wealth of medical and scientific knowledge has been assembled to prevent, diagnose, and treat tuberculosis. The disease is no longer solely one of medical significance and relegated entirely to the physician and surgeon. Its social and economic implications are far-reaching, and the anti-tuberculosis worker, whether he be administrator or clinician, throws his net widely and seeks aid from many quarters to combat the disease.

It is well known that a certain proportion of human tuberculosis, especially that of children, is caused by bovine tubercle bacilli, and that human beings may be infected through the ingestion of tuberculous milk or tuberculous meat. It has been estimated that not less than 40% of all the cows giving milk in England are infected with tuberculosis, so that there is every possibility of bovine infection. The proportion of cows actually yielding tuberculous milk is still probably between 1% and 2%. It is here that the veterinarian steps in to contribute his wide knowledge of tuberculosis in cattle towards preventing the disease in man. The link between medicine and veterinary medicine is an important one and mutually beneficial. This was a lesson that Sir William Osler was never tired of preaching, and he put his words into practice, for he had a teaching post at a veterinary college in his younger days, and made notable contributions to comparative pathology—for example, by his investigation of hog cholera. Sir Clifford Allbutt, also, realized the importance of epizootic disease in its relations to man, and was largely responsible for instituting a section of comparative pathology in the Royal Society of Medicine.

In tackling the problem of bovine tuberculosis the United States has obtained great success. This book by Prof. J. A. Myers of the University of Minnesota tells the story of the struggle and the triumph. The earlier chapters deal with the dependence of mankind upon domestic animals, particularly cattle, the development and progress of veterinary practice, and its value in solving important economic and public health problems. The prevention, diagnosis, and treatment of tuberculosis in cattle are discussed.

In the diagnosis of bovine tuberculosis main reliance is placed on the intradermal or intracutaneous tuberculin test. It is curious that the author makes no reference to the prolonged and careful work of the Tuberculin Committee of the Medical Research Council on this test, which is embodied in two reports, published in 1925 and 1928, or to the double intradermal method which the committee advocated. As regards the immunization of cattle against tuberculosis, Prof. Myers rules this question out of practical politics. He writes (p. 196): "Although B.C.G. and all other proposed methods of immunizing cattle against tuberculosis have been given adequate trial in North America they were found wanting and were completely discarded by the veterinary profession." So sweeping a conclusion would hardly receive general scientific acceptance, for a good deal of research work on this problem was done in this country up to the war by Buxton, Stanley Griffith, and others.

Prof. Myers gives details of the work done in the various States of the Union. He records with justifiable pride American achievement in eradicating reactors from tuberculous herds and in the building up of clean herds. Such achievement is equally possible in this country, but, as was the case at first in America, the question of expense has frightened stock-owners, although Jordan's work for the Medical Research Council has shown that good results can be secured in heavily infected herds at small cost. Prof. Myers notes that by eradication methods from 1917 to 1939 inclusive the incidence of reactors in tested areas decreased from 3.2% to 0.5%. This reduction must undoubtedly diminish the sources of bovine infection in human beings. At the same time a good deal of credit is due to the pasteurization of milk supplies, which is much more extensively done in the United States than in this country.

The final chapter of the book is entitled "Lessons for Physicians in Human Medicine." Here Prof. Myers claims that veterinarians are in advance of the medical profession. He holds that contagious tuberculosis is primarily a disease of adult life, that brief exposure to infection is dangerous, and advocates a much stricter segregation of tuberculous patients, to be enforced if necessary by legislative action.

All will not agree with Prof. Myers's conclusions, but his book is a mine of information on its subject and stimulates thought. The chief reflection it inspires is that the United States is far ahead of this country in dealing with the problem of bovine tuberculosis. This is not the fault of the British medical and veterinary professions, but because public opinion still fails to realize that much disease and suffering are brought about by drinking tuberculous milk, and legislation waits on public opinion.

WAR AND CRIME

War and Crime. By Dr. Hermann Mannheim. (Pp. 208. 10s. 6d. net.) London: Watts and Co. 1941.

A discussion of the influence of war upon crime can never depart very far from a consideration of the relationship between war and crime in general. It certainly seems as though a diminution in crime among "civilized" States ran with an increase in the ferocity of their wars. Dr. Mannheim's book indicates a great many attractive lines of thought which start from this central fact of the common factor between crime and war. He clarifies, first of all, two essential points of contrast: crime is an individual action, war a group action; crime is always a wrong, war is wrong only according to circumstances. He then inquires how far the various factors likely to produce crime may also be held responsible for the causation of war, and vice versa; and the further question of how far war itself causes crime. His final section deals with the attitude of international law as it exists to-day towards the distinction between just and unjust wars, and with analogies between war aims and aims of punishment.

Dr. Mannheim concludes that if the conception of war is restricted to unjust war, the difference between war and crime dwindles away almost to nothing. There exists accordingly a strong affinity between the causes of war and those of crime, and the methods which have been suggested for securing peace and for overcoming crime are, he points out, in many ways identical. They include institutional and social improvements, and, probably more important, psychological remedies which in their various ways canalize and deflect the aggressive spirit. In considering the influence of war on crime, he finds at first sight a contradiction. He believes, and gives plenty of evidence for the belief, that war is a potent source of crime and invariably increases the crime rate. On the other hand, he sees indications that war is sometimes a substitute for crime. At many points he finds the proba-

bility that war and crime may in some way be subject to the principle of indestructibility of matter: if either evil is discouraged in one form it may show itself in the other. Serious crimes of violence may decline owing to the competition of war as a more impressive form of violence, and they might increase if war were completely suppressed. Economic crimes, however, he finds, invariably thrive during and after wars.

His reasoning on the aspect of war as an international crime has intimate application to the present day. The dilemma with which he is confronted is that on the one hand it is vital for the upholding of decent standards of national and international morality that criminal responsibility should be extended to corporations and nations; on the other hand, criminal responsibility cannot be separated from the idea of guilt. This world is not one in which each individual can be the sole master of his acts, and so it seems hardly unfair to hold the entire community responsible for collective misdeeds which are only made possible by the support which the leader receives from the majority of the members.

This work, faithfully documented and factual as Dr. Mannheim's work always is, forms a substantial contribution to present-day sociological thought.

RADIOLOGY OF DIGESTIVE DISEASES

Clinical Roentgenology of the Alimentary Tract. By Jacob Buckstein, M.D. (Pp. 652; 525 illustrations. 50s. net.) Philadelphia and London: W. B. Saunders Company. 1940.

Recent books on *x*-ray work either deal elaborately with the technique and details of interpretation of radiographs or present a series of pictures in the form of an atlas of reference. Dr. Buckstein's volume is almost a textbook of diseases of the digestive tract written from the point of view of the radiologist. Full descriptions are given of the normal and pathological *x*-ray appearances of the whole of the alimentary canal with short notes of illustrative cases. The author treats the subject not as a specialist but as a physician who can take and interpret *x*-ray pictures, and he has made his book so readable and accurate that it may be recommended to a large public. The usual and well-known characteristics of gastric and duodenal ulcer, cancer of stomach and colon, and diverticula and ulceration of the colon are here well described; while the author's sound judgment is illustrated in his description of the care needed in assessing the progress of gastric ulcer by the amount of healing and size at the same exposure, especially the character of the edges and rigidity of the surrounding stomach wall, in the sections on the diagnosis of appendicitis, on enteroptosis and the relation of constipation and spastic colon.

This book is comprehensive enough to be of value to radiologists and students of radiology, and to the clinician it offers many admirable features. There is a useful bibliography and the illustrations are well produced.

DISEASES OF URETHRA AND PENIS

Diseases of the Urethra and Penis. By E. D'Arcy McCrea, M.D., M.Ch., F.R.C.S.I., F.R.C.S. (Pp. 306. 21s. net.) Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall, Ltd. 1940.

The publication of this book is a welcome sign of the vitality of medicine in this country even under wartime conditions. The author (whose recent death by enemy action will be in the minds of many readers) has produced a monograph on diseases of the urethra and penis which contains a wealth of material for the urologist and the general surgeon, and as such is a valuable book for the specialist. The general arrangement of the work is excellent, it is written throughout with clarity and lucidity, and it might well serve as a guide to many medical writers. The printing and the high standard of the many illustrations and drawings are of the quality which is associated with Messrs. John Wright and Sons of Bristol.

The book opens with very good accounts of the anatomy, developmental anomalies, and congenital malformations of the urethra and penis. The illustrations in these sections and in that dealing with epispadias and hypospadias are particularly valuable in elucidating the text. There is a full account of acute and chronic urethritis, their complications and treatment. The subject of urethral stricture is amply covered, its treatment well described, and the various operative procedures clearly illustrated. The various types of peri-urethritis due to extravasation of urine and acute infection, the chronic indurative type, and the rarer types due to tuberculosis, syphilis, etc., are all described in detail. Other sections of the book cover calculus and fistula of the urethra, tumours of the urethra and penis, and injuries and inflammations of the penis. Medicine and surgery in this country often have to carry on in the face of the most serious material and physical difficulties, and in this respect the Manchester urologists have had their share of difficulties. It is therefore all the more pleasurable to welcome a urological monograph of such high standard and critical outlook in wartime, but this feeling is tinged by sadness at the untimely death of the author.

Notes on Books

Electrocardiography, by Drs. C. MAHER and P. H. WOSIKA, is an elementary book intended as an introduction to the subject. The normal and the chief types of abnormal curves are illustrated by means of 100 tracings, and accompanying each are an analysis and interpretation. The figures are adequate but not first class, and the heavy time lines and horizontal 1 mm. lines impair their clearness, while the absence of any lettering on the waves makes the student's task more difficult. In one or two instances there are inaccuracies in the descriptions of the tracings, and the section on coronary disease lacks a good illustration of RS–T deviation in acute cardiac infarction. As a whole, however, this book well meets the requirements of the beginner. The third edition is published in Baltimore by the Williams and Wilkins Company, and in London by Baillière, Tindall and Cox at 22s.

Dr. DAVID FERRIMAN has written a useful monograph on *Acrocephaly and Acrocephalosyndactyly* (Oxford University Press, 10s. 6d.). It is based upon his own observations of eighteen cases of acrocephaly and an extensive investigation of the literature. The particular value of this monograph lies in the author's painstaking efforts to sort some order out of a complicated nomenclature—he asserts, for example, that Crouzon's disease (cranio-facial dysostosis) and acrocephaly are one and the same disease—and also in his insistence that treatment of a surgical nature to prevent optic atrophy must be undertaken early, certainly before the age of 5 years and probably better in the first or second year of life. Dr. Ferriman's evidence clearly points to familial transmission of the disorder almost certainly as a dominant, since one of the families investigated by him showed unquestionable evidence of the disease in three consecutive generations.

The *Dentists Register* for 1941 has now been published for the Dental Board of the United Kingdom by Constable and Co., price 12s., post free 12s. 9d. The total number of names appearing on January 1 of this year is 15,032, being twenty-two more than the figure for 1940. All the new entries added during the year were of persons registered as graduates or licentiates, and 1940 was thus the first in which no persons were registered without qualifications under the provisions of the Dentists Act, 1921–3.

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VACCINATION AGAINST TYPHOID

It may not be generally known that the method of making T.A.B. vaccine has passed through several stages of development during the last ten years. The antigenic analysis of the typhoid bacillus on which these developments are based has been largely the work of Dr. A. Felix, whose paper in our last issue (p. 391) described a further stage in the refinement of this product and the theoretical basis on which it rests. With S. G. Rainsford and E. Joan Stokes he reports in this issue (p. 434) the results of practical trials of the new vaccine, and makes recommendations about the method of its use. The difference between this vaccine and its predecessors is that in a considerable proportion of individuals it stimulates the production of Vi agglutinin, an antibody which hitherto has only been known to be produced in man by actual infection. That this antibody is important is self-evident from this fact alone; other evidence of its value involves a consideration of the various methods of estimating the immunizing power of a vaccine experimentally. One of these is the active immunization test in mice, in which administration of the vaccine is followed by inoculation with varying doses of living bacilli. This test, which has been extensively employed for some years, discloses no differences in immunizing power between vaccines killed and preserved in various ways, some of which are known to destroy the Vi antigen. Passive protection tests, on the other hand, tell a different story: the vaccine is here used to immunize a rabbit or other animal, and the protective power of this animal's serum is then estimated by administration to mice together with lethal doses of typhoid bacilli; this power has been shown to depend on its Vi antibody content. This antibody is also considered to be the most important element in the new therapeutic anti-typhoid serum.

There is therefore evidence from three directions that a vaccine which stimulates Vi antibody formation will immunize better than one which does not. The next question is how to prepare a vaccine which will do this. Experience with horses used in the preparation of anti-typhoid serum shows that heat-killed vaccines have not this effect; formalinized vaccines have, but the Vi antibody formed is functionally deficient, as indicated by the results of passive protection tests in mice and the study of phagocytosis-promoting property. The only type of killed bacterial suspension found to stimulate the production of efficient Vi antibody is one treated with alcohol. The two present papers record a study of the effects of such a vaccine in the human subject. It was first shown that an alcohol-killed vaccine, made of course from virulent cultures containing adequate Vi as well as O antigen, does in fact stimulate the production of Vi antibody in a substantial proportion of immunized individuals, although by no means in all. This property, however, was lost on preservation with phenol or tricresol. Tests were therefore made with a vaccine not only killed with alcohol but preserved in it, the respective concentrations used being 75% and 25%. With this method of preservation, which is fully efficient for averting contamination, the capacity for stimulating Vi antibody formation is retained for nine months at least. Such a vaccine causes the formation of as much O antibody as an ordinary heat-killed vaccine preserved with phenol. Since alcohol destroys flagella, an alcohol-killed vaccine naturally produces less H agglutinin; it was hoped that it might produce none, since this antibody has now been degraded to the status of a mere source of confusion in interpreting diagnostic agglutination tests, but the quantity formed is sometimes such that this difficulty still exists. Alcohol-treated vaccine causes less severe reactions than the old type of vaccine—a secondary but nevertheless important point in its favour. Those who are accustomed to regard severe reactions as an accompaniment of more efficient immunization may at first sight be suspicious of this, but a study has been made in the course of this work of the possible relation between degree of reaction and extent of antibody response, and no such relation has been found. A further study of the effect of different doses on antibody response suggests that the usual doses may safely be somewhat reduced, and a longer interval between them is advised.

Presumably this vaccine will shortly be issued in place of the old type of vaccine, which has been extensively used recently, and indeed is still in use, in areas and among persons possibly exposed to an unusual risk of enteric fever. It may be long before any conclusive evidence of its protective power is obtained in the form of data on the incidence of the disease in vaccinated subjects. It is one of the major misfortunes of immunology that the typhoid bacillus should not be pathogenic for any animal in the manner in which it is for man; really appropriate tests of immunizing procedures are therefore not possible in animals. The disease itself has usually so low an incidence that for any significant test in man the numbers employed must be very large. Thus, although anti-typhoid vaccine has perhaps as sound a theoretical claim as any bacterial vaccine to be considered effective, and has certainly been more used than any other, practical proof of its efficacy is difficult to obtain. It is a somewhat disturbing thought that such proof as we have relates mainly to immunization with vaccines prepared without any regard to the nature of their antigenic content, and certainly lacking the distinctive property of the new material. In the action of the new vaccine itself there is one disappointing feature—namely, that it by no means always elicits Vi antibody production when given to human subjects in customary doses, but only in a proportion which is sometimes about one-half and sometimes less. It is possible that the method of preparation may be improved still further, and in the meanwhile all the evidence obtainable by laboratory methods indicates that progress is being made in the right direction.

CRUSH INJURY AND KIDNEY FUNCTION

Wars have a habit of throwing up new medical problems or putting old problems in a new perspective. The cases reported in this issue of fatal renal failure after burial under debris may fall into either category. In the typical case the patient has been pinned by the limbs under fallen masonry and released usually after many hours. There may be no fracture and no external wound except superficial abrasions only. These abrasions become whealed and the limb swells, while at the same time plasma constituents are lost, the haemoglobin concentration rises, and the blood pressure falls. This stage of "shock" is satisfactorily treated by transfusion of serum or of plasma. It is then found that the urinary output is falling off, often with blood casts in the scanty urine. Vomiting becomes persistent, the blood urea rises, and many patients die in the course of a few days with renal failure as the predominant manifestation.

These initial communications are concerned more with a description of the clinical, biochemical, and pathological manifestations than with any attempt to explain the underlying mechanism. Although the pathological appearances in the kidney bear a resemblance to the transfusion kidney, transfusion of incompatible blood may be excluded as a cause. The diminution of urinary output after operations has usually been ascribed to low blood pressure, but hypotension seems to have been promptly treated and transient in those crushed patients whose records are adequate. A characteristic finding appears to be the rise of serum potassium, which cannot be ascribed to the renal damage. The workers at the British Postgraduate Medical School regard muscle injury as the most significant feature in the "crush syndrome," although histological evidence of this was rather scanty in one of their cases, while Mayon-White and Solandt failed to find any. None the less, "biochemical" damage may exist without there being any gross histological manifestations, and the mass of muscle which may be involved precludes full histological examination. Oedema of the crushed area and haemoconcentration have been fairly constant events, and it is also of interest to note that the blood pressure has been high in many of the patients after the initial shock.

The publication of these case records is timely for many reasons, apart from the immediate urgency of the problems they raise. First, crush injuries to limbs may prove to be common during the course of the war, and the collected material is a useful basis on which to build up further observations on the clinical course. Secondly, attention is drawn to the importance of more careful study of kidney function in trauma of all types. It is probable that the extreme and fatal picture presented by eleven out of the sixteen cases represents one end of a scale in which there may be all gradations. Thirdly, the subject is of great interest and significance in relation to general problems of extrarenal azotaemia and renal disease. The attempts made to explain the rising blood urea of hypochloraemia, gastro-intestinal bleeding, Addison's disease, diabetic acidosis, etc., have usually invoked the idea of lowered blood volume and diminished renal blood flow. It is possible that in these cases of crush injury some other factor is operating—perhaps autolytic products liberated in dead or dying tissues. In this connexion the resemblance to the toxaemic state commonly found in concealed accidental haemorrhage in pregnancy is worthy of note. In the majority of instances the toxaemia conforms to the characteristic eclamptic picture, but, in some, suppression of urine and a rapidly rising blood urea are followed within a short time by death from renal failure. In such cases it has been shown that a large area of the detached portion of the placenta has undergone necrosis while still incorporated with the remaining placenta and its circulation.[1] There are also resemblances to the toxaemia of severe burns, in which similar biochemical changes occur in the blood.[2]

The observations that have so far been made point to the need for amplification and clarification by animal experiment, and in view of the urgency of the problem we hope that such work will be pursued with an energy appropriate to the times. On the therapeutic side there are as yet few clear guiding lines as to what should be done. In at least one instance fairly early amputation of the affected limb failed to save life, while in others recovery occurred without amputation. It therefore cannot be said that crushing is in itself an indication for removal of the limb. There is a case for the trial of suprarenal cortical hormone with careful biochemical control, although it should be noted that the suprarenals showed little change at necropsy. The situation may be clarified by further and perhaps earlier studies. It is important that crushed casualties should be admitted whenever possible to hospitals where there are facilities for full investigation. Minor crushes are of great importance, and necropsies should be performed on those patients who die soon after release. When such studies have been made, together with control observations in other types of injury and with careful animal work, we shall be nearer an understanding of this new medical problem.

TUBERCULOSIS IN WARTIME

Tuberculosis has attracted much attention since the outbreak of hostilities. There are three reasons for this. First, when war was declared tuberculous patients were discharged wholesale from institutions, without any arrangements having been made for their alternative treatment and care. Secondly, there is the fear that the well-known effect of the war of 1914–18 on the incidence of tuberculosis may be repeated to-day. And, thirdly, it is increasingly realized that men with unsuspected pulmonary tuberculosis that could be detected by mass radiological examination have been admitted into the Services. In a supplement to the August–September issue of *Tubercle*, E. L. Collis examines statistically the incidence of tuberculosis and influenza in relation to the war of 1914–18. (The value of the ten graphs accompanying the paper is unfortunately diminished by absence of captions to most of them.) He concludes that the war years 1914–18 saw the mortality from tuberculosis steadily rising, but only in early life; then "suddenly, in 1918 came the great influenza epidemic as a famine pestilence, which struck in the

[1] Young, J. *J. Obst. Gyn. Brit. Emp.*, 1914, 25, 1
[2] Wilson, W. C., MacGregor, A. R., and Stewart, C. P. *Brit. J. Surg.*, 1938, 25, 826.

same period of life previously selected by tuberculosis." Heaf and Rusby in another paper review in detail the present position of tuberculosis. They discuss the pre-war background, the period of anticipated bombing, the effort to return to normal services, mass radiography and the examination of recruits, the threat of invasion, the period of intensified bombing, evacuation and tuberculosis, nutrition and rationing, rehabilitation in wartime, medical education, and "the future." There is much in this comprehensive review that will give food for thought to all tuberculosis workers, even if they may not agree with some of the views expressed by the authors. Perhaps the picture drawn of the pre-war background is far too rosy. It is said, for example, that "the strenuous efforts of Hawthorne and Esther Carling to obtain a safe milk supply *throughout the country* [our italics] were at last reaping their reward." Although due importance is given to rehabilitation, too little is said about institutional treatment; this is still so unsatisfactory that even before the war only an insignificant proportion of sputum-positive patients were discharged as quiescent. Finally, it is said that "too scathing a criticism" would be out of place in considering the policy adopted of evacuating tuberculosis institutions to make room for air-raid casualties. But the evacuation of these institutions before alternative arrangements had been made for the treatment and care of the large number of tuberculous patients affected emphasizes how uninformed is the official attitude to this common infectious disease, the most important cause of death in adolescence and early adult life.

PROBLEMS OF DENTAL CARIES IN CHILDREN

The aetiology and prevention of dental caries are complicated, and the subject is controversial. It is clear that individual cases can prove nothing, but unfortunately for those who want to give the best advice statistical studies of large numbers of children are likely to be difficult to interpret. Such a criticism, implying a lack of statistical training in the reader, may be made of an interesting study by B. R. East and Hilda Kaiser[1] on the relation, in rural American children, of dental caries to sex, age, and environment. These workers hoped to throw some light on the part played by vitamin D in the prevention of caries by studying the mean caries rate of children living in areas where climatic and other conditions were known to produce variations in the amount of solar ultra-violet radiation at the earth's surface, or to modify the conditions of exposure. They selected three climatic variables: mean number of hours of sunshine per annum, latitude, and mean winter temperature. The incidence of caries in children in 358 rural or semi-rural counties of twenty-four States of the U.S.A. was taken from data collected under the direction of the American Dental Association and the U.S. Public Health Service. Rural children were chosen for study because it was thought that they would be ethnologically more uniform than city children. White children only were studied, in order to exclude so far as possible the variable which cutaneous pigmentation might introduce. The caries rate at three different age periods (6 to 8, 9 to 11, and 12 to 14 years) for each sex was correlated with each of these climatic variables, and from a calculation of the correlation coefficient it is concluded that a statistically significant association could be established. But since the climatic variables were to some extent dependent on each other, it was desirable to measure the relation of the caries rate and each of the independent variables free from the influence of the remaining two. This was achieved by the statistical device of a partial regression equation. From this it is seen that the relation of dental caries to latitude and sunshine is what might be expected from the measures of ultra-violet solar radiation if vitamin D is an aetiological factor in caries. The greater the amount of sunshine available at a given place the lower is the caries rate. The more northerly a county the higher is the caries rate of the children. It appears that when the overlapping influences of sunshine and latitude are separated out there is little relation of winter temperature to caries rates except in the oldest and youngest groups of girls. The suggestion is made that the younger girls are more likely than their brothers to be kept indoors when the weather is cold and that the older girls in country districts are likely to have indoor duties. Apart from these speculations, the facts and the statistical conclusions drawn from them seem to establish very clearly an environmental factor in the aetiology of dental caries; they point the way to at least one method for preventing and controlling this disorder—the supply of sunshine, natural, artificial, or "bottled," as a vitamin D supplement. A recent statistical study in these columns[2] enabled Irene Allen to point to another factor. She was able to show a fairly high negative correlation between the increase in the average caries figure at 5 years of age and the increase in the nutrition figure. That is to say, at this age the greater the increase in a specially chosen nutrition index (indicative of improvement in nutrition), the less the increase in dental caries. At 6 years of age the same relation was found to exist, but not at 7 years, when the position is complicated by the shedding of so many of the deciduous teeth.

It may be concluded that even in children who have not received any special dietary treatment an improvement in general nutrition, as gauged by the weight and height index, is found in conjunction with increased resistance of the deciduous teeth to dental decay. Thus yet another factor in the tangled story seems to be established and an obvious practical step indicated in prevention and control. The individual child, though deprived of sunshine and inadequately nourished, may still turn up with a good set of teeth to disconcert the investigator; but such an event is a rarity and should not influence those who aspire to prevent or control dental caries in the young.

[1] *Amer. J. Dis. Child.*, 1940, **60**, 1289.

DARK-ADAPTATION TESTS FOR VITAMIN A DEFICIENCY

Since our last reference[3] to night-blindness and vitamin A further reports have appeared of attempts to use modifications of the biophotometer for the determination of the vitamin A intake of human beings. Isaacs and his colleagues[4] use an adaptometer made according to the specifications of Hecht.[5] They stress the importance of having control subjects in their experiments and of statistical analysis of results to prevent the drawing of unsound conclusions. In their own work they were unable to produce recognizable vitamin A deficiency by giving large doses of liquid petrolatum (5 c.cm. per kilogramme body weight) daily for periods up to 131 days in twenty-eight normal young adults. During this time twenty-nine untreated normal young adults were also under observation. Moreover, a diet containing only 74 U.S.P. units of vitamin A daily failed to produce definite measurable visual evidence or subjective signs of deficiency in three subjects in forty-three to forty-nine days. Nor when they

[2] *British Medical Journal*, 1941, **1**, 44.
[3] Ibid., 1940, **1**, 536.
[4] *Arch. Ophthal.*, Chicago, 1940, **24**, 698
[5] *J. optic. Soc. America*, 1938, **28**, 269.

were given massive daily doses of 300,000 U.S.P. units of vitamin A with 2,700 units of vitamin D in the form of a vitamin concentrate did they show any improvement. There was some trend towards increased dark-threshold levels between September and December in both the experimental and control groups. These workers conclude that the standard of vitamin A intake on which subjects are judged to be deficient is questionable, and that the procedures being used for measurement are probably recording something other than vitamin A deficiency. Blanchard and Harper[6] used a regenometer which also conformed to the specifications laid down by Hecht. It breaks down the visual purple of the retinal rods by a bright light and then measures the speed with which this rod pigment is regenerated. It measures the length of time required by the subject to perceive light of a fixed intensity instead of the intensity that can be perceived at a given moment. Ten students of 19 to 24 years of age were fed on diets low in vitamin A (300 to 550 U.S.P. units per day). At first the times required to see the test light varied from one to three minutes. As the time of the low vitamin intake went on, the time needed to see the test light rose to four to twenty-four minutes, the increase being gradual at first but more rapid later. On being given extra vitamin A improvement was detected in one to three hours, and a return to the normal range was obtained within two to ten days in six subjects, and in rather longer times in three more. The dose required for this was 1,500 to 3,600 U.S.P. units a day. Massive doses up to 250,000 U.S.P. units were not proportionately more effective than the smaller ones. A dose of 500 units caused some improvement but did not restore the subject to normal. Experiments with the biophotometer were made on the same subjects at the time when the regenometer recorded the longest adaptation times. Most of the subjects were found to be within the normal range by the biophotometer, and the workers conclude that the regenometer has a greater sensitivity in the detection of early stages of vitamin A deficiency. No clinical symptoms of vitamin A deficiency were observed during the course of the experiments.

ACUTE PULMONARY OEDEMA

Acute pulmonary oedema is considered by most clinicians to be a manifestation of failure of the left ventricle. The signs and symptoms are usually explained by the inability of the left ventricle to expel the blood delivered by the right ventricle, with consequent congestion in the pulmonary vascular bed. This explanation seems straightforward and reasonable; it provides a superficial explanation of the association of acute pulmonary oedema with disease or strain of the left ventricle, of the clinical picture, and of the benefit which results from venesection. Unfortunately, as experimental and clinical observations on pulmonary oedema have accumulated it has become clear that the validity of the "back pressure" or "left ventricular failure" theory can no longer be considered as established. In a recent review of the subject Luisada[7] emphasizes that pulmonary oedema cannot be produced experimentally by overloading the left ventricle or, indeed, by any mechanical procedure which would be expected to produce pulmonary congestion. He suggests that the primary factor is neurogenic, and that it is only when this is present that simple mechanical changes in the cardiovascular system can produce pulmonary oedema. The nature of this neurogenic factor is obscure. Various lesions in the central nervous system have been shown to lead to pulmonary oedema. Reflex stimuli arising in the heart and large vessels and in the hollow viscera may be precipitating factors. This review by Luisada is valuable, not because it clarifies the physiological processes involved in pulmonary oedema, but because it stresses certain inadequacies in the generally accepted theory that the disease is due to left ventricular failure. Another type of pulmonary oedema which is of more than topical interest is that produced by poison gas, and in the case of phosgene it has been stressed repeatedly[8] that vagal stimulation may be in part, at least, responsible for the pulmonary oedema. Only brief mention of this is made by Luisada, and he concludes that, although the inhalation of irritating gases may cause pulmonary oedema by direct damage to the capillaries, there are additional factors, nervous in origin, which are of importance.

NEUTRONS IN THE TREATMENT OF CANCER

The biological effects of fast neutrons have now been sufficiently investigated to permit their use in the treatment of cancer. Stone, Lawrence, and Aebersold[9] have had the use one day each week of a cyclotron, in which a beryllium target is bombarded by deuterons with energies of 8 million volts, producing a beam of neutrons with an intensity of 3 *n*/min. at a distance of 70 cm. from the target. The "*n*" unit is an arbitrary measurement of the intensity of a neutron beam, being that quantity of neutrons which produces the same amount of ionization in the thimble chamber of a Victoreen dosimeter as would 1 *r* of *x* rays. Thus the doses of neutrons and of *x* or gamma rays to effect the same biological change may be compared. As pointed out in a recent paper by Gray, Mottram, Read, and Spear,[10] neutron ionization is usually more efficient, even when the fullest allowance has been made for the uncertainties of neutron dosimetry. The ratio of the gamma-ray dose in *r* to the neutron dose in *n* for the same biological effect is usually of the order of 4, while in one case—the lethal effect on bean roots—it is as high as 11. Gray, taking into account the fact that neutron radiation produces in tissue seven times as much ionization as in an equal mass of air, whereas the absorption of gamma-ray energy is very nearly the same per unit mass of air and of tissue, has defined a neutron unit based on the increment of energy in unit volume of tissue, and this fortunately appears to be roughly equal to the arbitrary *n* unit of Lawrence and Aebersold. Gray and Spear find that there is a qualitative difference between gamma rays and neutrons in their inhibitory effect on mitosis in tissue culture, as well as the quantitative difference which alone has been found in previous experiments. As is well known, there is a threshold of intensity and dose below which gamma rays have no observable effect, but for neutrons this appears to be zero. Stone also describes a small qualitative difference in the erythema produced by neutrons: it appeared earlier and had more dry flaking of the skin than the corresponding *x*-ray erythema. The average single dose given on a 10 by 10 cm. field was 150 to 200 *n*, which had the same effect as 900 *r* of 200 kV *x* rays. Twenty-four patients with advanced lesions were treated in the preliminary experiment, and in every case there was some decrease in the size of both the primary growth and the metastases, in spite of the fact that they were single-dose treatments, not fractionated and not approaching the skin tolerance. Perhaps the most promising observation was that the metastases in the cervical glands responded better than the primary growth, although, in the absence of any measurement of the percentage depth dose, it is

[6] *Arch. intern. Med.*, 1940, 65, 661.
[7] *Medicine*, 1940, 13, 475.
[8] *Proc. roy. Soc. Med.*, 1937, 31, 1535.
[9] *Radiology*, 1940, 35, 322.
[10] *Brit. J. Radiol.*, 1940, 13, 371.

difficult to assess its significance. Stone now has a new cyclotron of double the power to be used largely for clinical purposes, so that he is able to give fractionated treatment, each dose being 50 *n* at the rate of 5 *n*/min. He appears to have solved the problems of collimating neutron beams and of protection of the personnel, and his further results will be awaited with interest.

ECONOMY OF DRUGS IN WARTIME

Our *Supplement* this week reproduces substantially in full a memorandum, drawn up by the Therapeutic Requirements Committee of the Medical Research Council, on economy in the use of drugs in wartime. For the convenience of readers we have regrouped the complete list of drugs into the four categories adopted by the committee instead of printing them all in alphabetical order as one very long table with key letters. The committee, at the end of a prefatory note, makes it clear that this list is primarily intended to secure the wisest economy in drugs for human and veterinary use in this country and that other considerations may affect the importation or manufacture of drugs for the export trade. The committee also indicates the reasons underlying its classification of drugs and puts forward a number of points for the information and guidance of medical and veterinary practitioners when prescribing under the conditions of to-day. Economy in the use of a drug may be necessary in wartime because the drug is imported or because its manufacture at home diverts materials and skill from other essential services. An appendix (which we do not reproduce) gives a list of the drugs whose production the committee recommends should be encouraged either in the United Kingdom or in the British Empire. The pamphlet is published as M.R.C. War Memorandum No. 3 by H.M. Stationery Office, price 3d.

IMPETIGO

Impetigo contagiosa is perhaps the commonest of skin diseases. But although much work has been done upon it, both clinically and bacteriologically, since it was originally described and differentiated by Tilbury Fox nearly eighty years ago, the question of its aetiology is still open to debate. Soon after the beginning of the present century Sabouraud appeared to have proved that impetigo was always caused by the streptococcus. That the staphylococcus was often grown from impetiginous lesions was thought to be accounted for by the fact that staphylococci tended to swamp streptococci when grown under aerobic conditions; the staphylococci were considered to be secondary contaminations. Bullous impetigo was well known clinically, but the bullae were regarded merely as overgrown vesicles, and vesicular impetigo with typical "stuck-on" crusts was known to be of streptococcal origin. Of late years, however, the position has changed. Pemphigus neonatorum, which has always been recognized as closely related to bullous impetigo, and in point of fact can be considered as an extensive and virulent form of that eruption, is now generally acknowledged to be the result of a staphylococcal infection. A number of observers have also shown that bullous impetigo is always of staphylococcal origin. It now appears, therefore, that there are two types of impetigo which can usually be differentiated clinically, though the two types are sometimes mixed. At Jadassohn's clinic all the workers on this disease used to record their opinions about the type of each case, and after a while there was almost always unanimous agreement on whether a case was streptococcal, staphylococcal, or mixed. Epstein,[1] who originally worked in Jadassohn's clinic but is now in America, has lately done much to support the theory that there are two types of impetigo, which may become mixed in the same patient. He studied the staphylococci obtainable both from cases clinically characteristic of staphylococcal impetigo and from those of streptococcal impetigo, in which staphylococci could only be looked on as secondary contaminations. Epstein found that in the former every case studied yielded the same type of staphylococcus; in the cases which were clinically streptococcal numerous staphylococci were isolated.

The great difficulty in studying the bacteriology of the skin is that normally all types of micro-organisms are constantly present on it. With suitable methods of cultivation a great variety of cocci, fungi, and yeasts can be grown from the skin. Nevertheless the constant appearance of one type of staphylococcus in clinically distinguishable cases strongly suggests that this type is the causal organism. Epstein has also experimentally produced bullous staphylococcal impetigo by inoculation with a pure culture of *Staphylococcus aureus* obtained from lesions of bullous impetigo. Another point in favour of staphylococcal impetigo as a clinical entity is the fact that staphylococcal and streptococcal impetigo vary in frequency according to age groups, the former being relatively commoner in adults. It is also found oftener in some localities than others.

A TRIBUTE FROM NEW ZEALAND

Many kind things about our Centennial number have been said by readers at home and abroad. We take particular pleasure in quoting as follows from an editorial in the *New Zealand Medical Journal* for December, 1940:

"The official Journal of the parent body celebrated its centenary on October 5, 1940. Thus the birthday number of the most widely circulated and most influential medical periodical in the world was constructed and published in London after weeks of intensive air raids. To this creative effort, and indeed to the sustained excellence of the *British Medical Journal* under extreme duress, we do homage. Perhaps we in New Zealand, who can only speculate as to what the future has in store, will see some special significance in this particular number from Tavistock Square, which deviates not one iota from the traditional dignity and excellence of its forerunners and which betrays not by so much as a misplaced comma the magnitude of the difficulties which must have attended its birth. If men of great courage and high ideals can successfully prosecute the dissemination of professional knowledge under conditions of total war, which we can only dimly comprehend, then the ultimate future of our ideals and of our profession must be secure. We are told there is an intellectual black-out in Europe at present; but there has been no black-out of the *British Medical Journal* or, indeed, of any other of the well-known medical journals of the United Kingdom on which we rely so much."

[1] *Arch. Derm. Syph.*, Chicago, 1940, 42, 840.

Mr. Gilbert H. Carr, honorary secretary of the American Committee for Air Raid Relief and of the Advisory Committee of the British War Relief Society of America, has been appointed Director-General of the American Ambulance, Great Britain.

FURTHER CASES OF CRUSH INJURY

COLLECTED BY THE MEDICAL RESEARCH COUNCIL SUBCOMMITTEE ON TRAUMATIC OEDEMA

With the kind permission of the physicians and surgeons concerned abstracts are appended of 11 case reports sent to the Medical Research Council. All these patients were pinned under debris for a period between three and twenty-six hours.

Group A: Fatal Cases.—Cases I to VI proved fatal between the fifth and tenth days: they ran a course similar to that of the cases details of which are given in the papers in this issue contributed by Bywaters and Beall (p. 427) and Mayon-White and Solandt (p. 433), with hypertension, blood-stained urine, oliguria, and oedema of the crushed limbs. These had plasma and serum transfusions only. Cases IV and V showed albuminuria only. *Post-mortem* examination revealed what appeared to be blood casts in the renal tubules in 4 cases.

Group B: Cases with Recovery.—Blood was found in the urine of Cases IX, X, and XI, and in the cases without haematuria (VII, VIII, and IX) the urinary output rose to normal on the fifth or sixth day. Case IX had no intravenous therapy, but the blood pressure rose to 176/110 mm. Hg. Although in this second group of cases the degree of swelling and the duration of crush differ little from those of Cases I to VI, yet the patients recovered, except for local tissue death.

Case I

A man aged 20 was pinned down by debris on the left lower leg for ten hours.

Examination.—Hb 150%. P. 135. B.P. 110/70. 1,120 c.cm. plasma given.

2nd Day.—Hb 130%. P. 110. B.P. 130/88. Intake by mouth 1 litre. Urine 650 c.cm.

3rd Day.—Drowsy. L. leg tense and swollen with pitting oedema. Pulse palpable; better on injured side. Anaesthesia of left leg. Fracture of tibia (radiograph). Slight vomiting. B.P. 155/100. Hb 120. Blood urea 188. Blood potassium 26 mg.; plasma chloride 480 mg.; blood phosphate 7.7 mg. per 100 c.cm. Urine (catheter) 205 c.cm., smoky, with pigment-cast sediment. E.C.G. showed slurring of QRS.

4th Day.—B.P. 150/100. Hb 100. Vomiting, drowsy, hiccup. Urine 100 c.cm., clear yellow. Microscopically: rare pigment cast. Intake 1,350 c.cm. 1 litre of 5% glucose given intravenously.

5th Day.—B.P. 160/100. Hb 98%. Vomiting, drowsy, slightly disorientated. Intake 990 c.cm. Urine 250 c.cm., clear. No sediment.

6th Day.—Urine 490 c.cm. A few casts.

7th Day.—Died very suddenly with marked stertor and irregular pulse. Observations on swelling of the leg were made and daily biochemical analyses of blood and urine were performed. These are included in the fuller account of this patient published in this issue at p. 432.

Necropsy (Dr. Miles).—Gross necrosis of muscles with fracture of tibia. Collapse of right lower lobes of lung. Kidneys pale. Microscopically: Tubular degeneration and pigment casts in the collecting tubules.

Case II

A youth aged 17 was pinned down by three dead bodies under timber and rubble for fourteen hours.

Examination.—Drowsy. P. 96, volume good. Abrasions on arms and whealing on right foot, leg, and lumbar region. Impaired movement of right chest.

3 Hours after Admission.—B.P. 100/70.

7 Hours after Admission.—Condition poor. B.P. 80/60. P. very poor (120). Some slight vomiting. Was given oxygen, morphine, coramine, 200 c.cm. of twice-normal reconstituted dried serum (M.R.C.), and 5 c.cm. desoxycorticosterone.

2nd Day (12 Hours after Admission).—120 120 c.cm. dark brown urine obtained by catheter; contained large number of blood casts. P. 104. B.P. 100 80. Was given plasma, 1,680 c.cm., 560 c.cm. 2½% glucose. B.P. rose to 140/90. Still vomiting; some brawny oedema of right lower abdominal wall. Hb 95%. Blood urea 101 mg./100 c.cm. Later—4.3% sodium sulphate, 560 c.cm., and 5% glucose, 1,180 c.cm. given intravenously. Total urine for the day 170 c.cm. Condition fair but restless.

3rd Day.—Urine 60 c.cm., dark, and contained a few casts. P. 104. B.P. 150/100. Vomiting. 900 c.cm. Sweating. Drowsy, restless, oedema of right foot. Intake 2,110 c.cm. by mouth. 5 c.cm. desoxycorticosterone and 5 minims adrenaline given. Blood urea 45 mg. 100 c.cm. Hb 98%.

4th Day.—Patient more drowsy. Continual vomiting. Oedema of right leg. P. 112. B.P. 175 85. Blood urea 69 mg. 100 c.cm. Urine 45 c.cm. A few casts still present. Sodium sulphate, 840 c.cm., and glucose saline, 1,680 c.cm. In spite of this, condition deteriorated. He became flushed, breathing stertorous, and moist sounds were heard all over the chest. P. 120. B.P. 180 80. *Patient died on 5th day.*

Necropsy.—Lungs: fibrinous exudate over left lung and congestion. Kidney: cortex pale. Spleen: congested. Microscopically: pigment casts in the collecting tubules.

Case III

A man aged 28 was pinned under debris by the right leg for six hours.

Examination showed a few grazes only, no fracture (radiograph).

2nd Day.—Marked swelling of upper thigh. Plasma, 560 c.cm. preceded by saline, 1 litre, given intravenously. 1 hour after completion of plasma transfusion, 120 c.cm. of dark smoky urine passed.

3rd Day.—A small amount of urine passed.

4th Day.—A small amount of urine passed.

5th Day.—Began to sweat. A small amount of urine (a few ounces) was passed daily for this and the next four days, containing albumin, blood, and casts. The pulse varied from 55 to 80. B.P. rose to 150 100. Despite intravenous 50% glucose and mersalyl he died on the *10th day.*

Necropsy (Dr. Powys): 24 hours after death.—Slight right-sided dilatation of heart with petechiae of pericardial surface. Massive collapse of both upper lobes of lungs with oedema elsewhere. Liver: congested, cloudy swelling. Kidneys: cloudy swelling and mottled cortex. Microscopically (Dr. Bryson): blood casts in tubules.

Case IV

A girl aged 15 was buried under debris for thirteen hours. She complained of numbness of right leg and pain in right hip.

Examination: Large raised wheal over right buttock and across abdomen. Tender over right hip. Radiograph showed linear fracture of right pelvis. Pulse 124. B.P. 98/70. T. 100°. Has passed urine. Anaesthesia of right thigh, right leg, and right foot. Very thirsty.

10 Hours Later.—Restless. Mentally very alert. Hb 120%. Pallid, cyanosed, and vomiting. B.P. unobtainable. Plasma given intravenously. Urine 180 c.cm., obtained by catheter, containing albumin; sp. gr. 1016. Complained later of abdominal pain with rigidity in right iliac fossa. Blood drip started.

2nd Day.—B.P. 90 70. Less vomiting. Less abdominal pain. Urine 360 c.cm., nothing abnormal detected; sp. gr. 1018.

3rd Day.—Still very thirsty and mentally alert. Some return of sensation in upper right leg.

4th Day.—Tense swelling of upper right thigh. B.P. 100/70. Slight vomiting. Intake 1,140 c.cm. by mouth. Urine 90 c.cm., containing small amount of protein, moderate number R.B.C., and nothing else abnormal except a few bacilli. Blood urea 228 mg./100 c.cm.

5th Day.—Tense oedema of right thigh, right leg. Vomiting, hiccup. Cystoscopy showed small amount of blood at base of bladder. Blood urea 360 mg./100 c.cm. Clotting times done. 200 c.cm. 50% sucrose given, and later intravenous saline.

6th Day.—Condition worse. Mentally still very alert. Pulse irregular. B.P. not obtainable. Hiccup, vomiting. Hb 90%. Blood urea 398 mg./100 c.cm.

7th Day.—Patient died in coma.

Necropsy.—Lungs: basal collapse. Haematoma in buttocks and near sciatic nerve. The left kidney showed yellow spots all over it and on the cut surface. Bladder showed oedema and a little fluid blood. Microscopically (Dr. Pragel): pigmented casts in collecting tubules and some hyaline materials in Bowman's capsule and convoluted tubules in the lungs. The lungs showed early bronchopneumonia and small areas of haemorrhage with a few capillary hyaline thromboses.

Case V

A man aged 35 was buried under debris with legs between planks for three to four hours.

Examination.—Swelling of right forearm, both thighs, and left calf, with a few abrasions and considerable whealing. Tenderness over pubis, with fracture of pubis (radiograph) but no displacement. P. 102. B.P. 102/70. Hb 150%. R.B.C. 7,200,000. Blood N.P.N. 76 mg./100 c.cm. Urine (by catheter) 150 c.cm., containing heavy albumin deposit. Exploratory laparotomy was done (? laceration of bladder). Following this a further 480 c.cm. of urine was obtained. B.P. 124/94. Total fluid intake for the day, 3.6 litres. Slight vomiting.

2nd Day.—Intake 720 c.cm. Vomiting 420 c.cm. Urine 390 c.cm. Hb 136%. R.B.C. 6,200,000. N.P.N. 120 mg./100 c.cm.

3rd Day.—Pulse 76. B.P. 140/104. Intake 1,320 c.cm. Vomiting 180 c.cm. Urine 450 c.cm. Hb 119%. R.B.C. 6,200,000. N.P.N. 144 mg./100 c.cm.

4th Day.—N.P.N. 168 mg./100 c.cm.

5th Day.—Hb 108%. Faint trace of albumin in urine.

6th Day.—Temperature rose, due to haemolytic streptococcal infection from left leg.

7th Day.—Died. Septicaemia.

Necropsy.—No visceral injury in abdomen or pelvis. Kidneys large (320 grammes), blurred definition of kidney markings. Petechiae in pleura and on heart surface. No microscopical examination made.

Case VI

A woman aged 27 was buried under debris (?) hours. On admission she passed a fair quantity of blood-stained urine.

Examination (2nd Day).—Cold, pulseless, and shocked. 5 pints plasma in 2½ hours raised B.P. to 110/70 and P. to 120. There was slight external bruising of chest and flanks.

3rd Day.—Started to vomit. No urine for 24 hours; 225 c.cm. blood-stained urine by catheter. 4 pints saline given.

4th Day.—Blood urea 164 mg./100 c.cm.

7th Day.—540 c.cm. bloody urine passed, with clots. Caffeine and sodium salicylate grains 7 given subcutaneously.

8th Day.—Bloody urine again, with clots. Patient perfectly rational.

9th Day.—11.30 a.m., patient suddenly died "for no apparent reason."

Necropsy.—Macroscopically: cystitis only. Microscopically (Prof. G. R. Cameron): Lung showed pulmonary oedema. Liver and spleen normal. Kidney showed finely granular exudate in Bowman's capsule and convoluted and collecting tubules. Blood casts and free red cells in the lumen. Focal haemorrhages interstitially. Extensive subpelvic extravasation of blood.

Case VII

A man aged 34 was crushed beneath debris, with pressure on both lower limbs, for twenty-two hours.

Examination.—On admission cheerful; no shock; erythema on legs, with numbness and difficulty in moving them. P. 120. R. 18. T. 100°.

2nd Day.—P. 100. Intake 3,510 c.cm. by mouth. Vomiting, 2,100 c.cm. Urine 300 c.cm.

3rd Day.—Abdominal rigidity. Intake by mouth 60 c.cm.; by vein, plasma 560 c.cm., saline 1,120 c.cm., 4% dextrose 1,120 c.cm. Vomiting, 750 c.cm. Urine 420 c.cm.

4th Day.—Intake by mouth 1,920 c.cm. By vein the same as previous day. Vomiting, 930 c.cm. Urine 420 c.cm. P. now 90. Both legs swelling rapidly and becoming oedematous.

5th Day.—Intake by mouth 1,650 c.cm.; by vein 600 c.cm. No vomiting. Urine 2,190 c.cm. P. now 80.

6th Day.—Urine over 660 c.cm. Evacuated to country.

Examined at base hospital on the sixth day. Anaesthesia and oedema of the foot, with skin sloughs. All pulses palpable. Extremely excitable. B.P. 120/70. Urine sp. gr. 1010 Guaiac test negative. No albumin. Volume about 2 litres daily.

10th Day.—Blood urea 192 mg./100 c.cm. Hb 85%. B.P. 135/88.

13th Day.—Blood urea 84 mg./100 c.cm. Urea clearance 50–60%. B.P. 126/84.

14th Day.—Blood urea 43 mg., plasma chloride 538 mg. per 100 c.cm. B.P. 126/80.

16th Day.—B.P. 126/84. Urine normal.

21st Day.—Blood urea 60 mg./100 c.cm. Urea clearance 45–55%. Slough separating over right outer shin.

25th Day.—Blood urea 30 mg./100 c.cm. Granular and cellular casts in urine in centrifuged deposit. Slough separated —tendons exposed.

3 Months.—Urea clearance 55–68%. Blood urea 30 mg./100 c.cm.

4 Months.—Apparently recovered except for slowly healing ulcer on right outer shin extending down to bone and tendons. Feels well, and ambulatory with leg in plaste B.P. 110/70. Blood urea 28 mg./100 c.cm. Urea clearan 69–71%. Urine sp. gr. 1012. Nothing abnormal.

Result.—Recovered.

Case VIII

A woman aged 28 was trapped under debris for twenty- hours. She complained of numbness and inability to use th left arm and left leg.

Examination.—"Shocked," with shallow gasping respir tion. Subnormal temperature. P. 124. The left chest w flattened and showed poor air entry but no fractured rib Apex beat not displaced. The left leg showed oedema an pressure blisters. There was numbness on the left side of th body. Blisters also on right buttock and left shoulder.

2nd Day.—Hb 104%; T. 100.6°; P. 140. Intravenou plasma 150 c.cm. was given, leading to rigor, followed b 2,400 c.cm. dextrose (4%) saline. Hb fell to 90%. P. 11(Urine 300–350 c.cm.

3rd Day.—Fluids by mouth, 3 litres. Urine output 300–35(c.cm.

4th Day.—Fluids by mouth, 3 litres. Urine, 960 c.cm.

5th Day.—Fluids by mouth, 3 litres. Urine, 1,530 c.cm The left thigh extremely oedematous; a large sloughing are on right buttock, which in the next few weeks separated t expose the gluteus maximus.

10th Day.—Sulphapyridine and blood transfusion given.

5th Week.—Granular and hyaline casts found in urine.

Result.—Recovered.

Case IX

A man aged 31 was buried under debris compressing both legs from below the knees for seventeen hours.

Examination.—Condition good. B.P. 110. Legs painful, with three small abrasions. Loss of touch, impairment of pain sensation, and some loss of muscle movements in both legs below the knee. Urine 390 c.cm., blood-stained. Intake by mouth ? 1,320 c.cm. Pulse rose from 68 on admission to 120 five hours later.

2nd Day.—B.P. 176/110. P. 110. Intake by mouth 2,790 c.cm. Urine 150 c.cm., blood-stained, at 4 a.m. 360 c.cm. clear urine subsequently.

3rd Day.—Now considerable swelling of legs. Intake over the next few days by mouth ranged from 1,260 to 2,670 c.cm. Urine output 720 c.cm., 750 c.cm., 600 c.cm. on succeeding days, rising abruptly to 1,740 on the eighth day.

16th Day.—Still gross oedema; skin glossy, flushed, and hot, with pitting oedema.

4th Week.—Oedema now almost disappeared.

Result.—Recovery.

Case X

A girl aged 17 was buried under debris for thirteen hours.

Examination.—Drowsy: abrasions to face; fracture of forearm; burns both hands and feet. B.P. 110/80.

9 Hours Later.—Restless. B.P. falling (90/80 and lower). Intravenous plasma and proseptasine given.

2nd Day.—B.P. 115/100. Swelling of right knee and of face. Over 360 c.cm. urine containing albumin; sp. gr. 1024.

3rd Day.—Left foot cold, blue, and mottled. Firm oedema below knee. No pulsation felt at ankle. Bruising of left thigh. Under gas-and-oxygen, multiple incisions, evacuating much fluid, made into deep fascia.

4th Day.—Condition poor; vomiting. 5% dextrose and heparin given intravenously. Foreign body removed from left eye.

5th Day.—Gangrene left toe.

6th Day.—Condition better. No more vomiting. Oedema less.

7th Day.—Transferred.

At Leavesden Hospital the left leg became less swollen but still showed anaesthesia. Amputation through the tibia was done (for gangrene). The muscles had undergone avascular necrosis. Three months after accident general condition good.

Case XI

A youth aged 17 was trapped by legs under debris for twelve hours.

Examination (36 hours after injury).—Restless. B.P. 120/74. P. 88. Pitting oedema left and right legs. Right foot blue and cold, and dorsalis pedis not pulsating. Macroscopic haematuria, which diminished during the next four days. 8.5 grammes of sulphapyridine on first, second, and third days. 2 pints Group O blood on second day.

5th Day.—Circulation returned to leg, which showed blebs. No haematuria.

8th Day.—Blood urea 40 mg./100 c.cm. Several hyaline and granular casts noticed.

12th Day.—Superficial gangrene of leg. Considerable number of casts.

25th Day.—Hb 60%. Osteomyelitis and osteoperiostitis of tibia and fibula.

47th Day.—Muscle slough separating.

Result.—Recovery.

It is to be hoped that in future cases particular attention will be paid to: (1) Presence of anaesthesia or whealing. (2) Oedema—daily extent and progression (circumference measurements). (3) Pulse in the limbs, and, if possible, oscillometric readings. (4) Blood pressure, initial and daily readings. (5) Initial haemoglobin measurements and biochemistry of blood (serum for potassium and urea). (6) Urine, daily from time of entry, quantity, colour, and examination for blood, albumin, and casts.

The Subcommittee on Traumatic Oedema of the Medical Research Council desires to thank the following for their kindness and co-operation: Mr. Romanis (Case I), Miss Margaret Louden (Case II), the Chief Medical Officer of the L.C.C. (Case III), Dr. Avery Jones and Dr. Abdullah (Cases IV and X), Dr. Pochin and Dr. J. Squire (Cases V and IX), Dr. Whittingham (Case VI), Prof. Christie, Mr. Naunton Morgan, and Mr. Hosford (Case VII), Mr. Naunton Morgan (Case VIII), and Dr. Bolton (Case XI).

AWARDS FOR GALLANTRY IN CIVIL DEFENCE

The award of the George Medal to Dr. O. M. Holden, medical officer of health, Croydon, is announced in a *Supplement* to the *London Gazette* dated March 7.

DR. OSCAR MADELEY HOLDEN: "A heavy calibre bomb hit a report centre, completely demolishing it. There were five telephonists in the room at the time, three of whom were killed instantaneously and two ultimately rescued alive. One of the latter was trapped under tons of debris, but was able to communicate with the rescue party personnel. It was seen that she had been severely injured. Dr. Holden, at great personal risk, crawled under the wreckage and proceeded in the most difficult conditions imaginable to administer morphia to her. Owing to the abnormally confined space in which he had to work Dr. Holden was only able to come out by crawling backwards. During the time he was working debris was continually shifting and he was in great danger of being buried under the ruins."

The award of the George Medal to Dr. D. C. Logan, assistant medical officer of health and resident hospital medical officer, Clayponds Emergency Hospital, and to Dr. M. Kamill, house-surgeon, Clayponds Emergency Hospital, is announced in a *Supplement* to the *London Gazette* dated March 14.

DR. DANIEL CRAWFORD LOGAN and DR. MOSTAPHA KAMILL: "A time bomb penetrated the roof of the diphtheria block at the Clayponds Hospital, coming to rest among debris on the floor of the bathroom, without exploding. Dr. Logan and Dr. Kamill, who had experienced the results of previous bombings on the hospital, arranged for the evacuation of the patients. They carried out their duties with coolness and courage, regardless of any danger to themselves, and prevented the possibility of great damage being done to the hospital buildings and to the houses of people adjoining. There is no doubt that by their initiative and devotion to duty Drs. Logan and Kamill saved many lives."

Local News

AUSTRALIA

The Australian Red Cross Society

The Charles Mackay Oration was delivered recently at the Institute of Anatomy in Canberra by Dr. J. Newman Morris, C.M.G., whose subject was the origin and growth of voluntary aid to the medical services in time of war. After a sketch of the policy and structure of the Red Cross movement, he dealt with the history of the Australian Red Cross Society, which was founded in 1914 as a branch of the British Red Cross organization, and in 1926 became a national society on its own. Voluntary aid detachments have been a recognized technical reserve of the Australian Army Medical Corps ever since the last war, and the administration is vested in a joint council as in Great Britain. One service of the Australian Red Cross in the present war was specially mentioned by Dr. Morris—namely, the organization of blood transfusion. It was considered necessary to provide an emergency transfusion service among women, who have readily volunteered, and the technical work has been done almost entirely by women doctors. The transfusion service of the Australian Imperial Forces has found this Red Cross emergency service of the greatest value, and it has been worked in association with the Commonwealth Serum Laboratories. The latest contribution of the women has been to give large quantities of blood serum, which is preserved and forwarded over-seas to be used for wounded men of the A.I.F. Other work of the Australian Red Cross has been the maintenance of a Red Cross unit in the Middle East, the provision of sixty-three ambulances for service with the Forces and of six mobile advanced dressing stations, and the establishment of convalescent homes for sick men of the Forces in three States. It is probable that since the oration was published, in November of last year, these provisions have been largely exceeded.

INDIA

The Health of Bombay

The Province of Bombay has a population of close upon twenty millions and a birth rate of 39 per 1,000, which is nearly three times the birth rate of Manchester. The infant mortality rate (152.7 per 1,000 births) in 1939 was the lowest ever recorded in the province. The increase of population is regarded with some disquiet. As the annual report of the Director of Public Health points out, at one time a high birth rate was taken as an index of the prosperity of the country. Evidently, an unhealthy population cannot be expected to have a high birth rate, but at the same time it is not impossible for a prosperous and healthy country to have a comparatively low one. A reasonably low birth rate is far to be preferred, says the Director, to the excessive one of over 50 per 1,000 which is recorded in several districts of the province. The death rate in Bombay (25 per 1,000) is going down, and the decrease applies to almost every one of the common causes of mortality. It is pointed out that the total death rate in recent years has been scarcely affected by any decrease or increase in deaths due to epidemic diseases. It depends mainly upon constitutional rather than accidental causes. The latter have in recent years been brought under control to a great extent, so that it is now unusual for an epidemic to run like wildfire and cause enormous waste of life as formerly. The only diseases for which an increase in the death rate is recorded are plague (a slight increase) and smallpox (a considerable increase, from 0.24 per 1,000 in 1938 to 0.38 in 1939). Although there was a decrease in the number of deaths from tuberculosis, 23,195 persons died from the disease in the year 1939, and the total deaths due to all epidemic diseases do not amount even to one-half of the deaths caused by tuberculosis. It would therefore be unwise to assume that the spread of tuberculosis has been checked, or that the factors causing constitutional diseases—low standard of living being the most prominent—have been removed. The cholera epidemic of 1939 was of a mild nature, and the number of deaths was the lowest since 1932. The annual report bears encouraging witness to the growth of urban and rural sanitation in Bombay and the activity of many health movements, especially maternity and child welfare and school hygiene.

Reports of Societies

WAR INJURIES OF THE SPINE

A meeting of the Section of Surgery of the Royal Society of Medicine was held on March 5, Mr. J. B. HUNTER presiding, at which a discussion took place on "War Injuries of the Spine."

Mr. JULIAN TAYLOR, after some reference to the historical aspects of the subject and his own experiences during the last war, said that the injuries fell into two classes, the larger being what might be called the civil group, in which motor cars or falling masonry were the usual causes; and the smaller, the group of injuries caused by projectiles. The damage to the cord and the effect on the functions of the victim were similar in both classes, and in all cord injuries and in both groups there was a high proportion of neurologically complete interruptions. Interruption of conductivity of the cord might be due to one or more factors. Thus there might be complete severance, physiological interruption due to crushing without section, or what was called spinal concussion or shock. These were instantaneous events, but at the site of crushing there usually occurred some bleeding later, which tended to spread up and down the substance of the cord in more or less cylindrical form, giving place still later to cavities containing clear fluid.

The effect on the conductivity of the cord of all these agencies, except severance, might be transient; part of the immediate effects might be due to temporarily acting conditions, part to permanent. Theoretically, by adding a fraction of the temporary to a fraction of the permanent a complete interruption might be made, and thus it would not be possible to say what chance there was of improvement of a temporarily complete paraplegia. Unfortunately there was no such ground for uncertainty, for it was the experience of Sargent and of Trotter that with early complete paraplegia no return of function was to be seen. The speaker himself had never found evidence of recovery in such cases.

Interruptions of the Spinal Cord

Haemorrhage into the substance of the cord was capable of producing increasing degrees of interruption after an accident. The increase was due at first to continued effusion of blood, and later to the reaction to its presence in the tissues of the cord. A partial lesion might be recognized clinically by persistence below its site of skin sensibility or of motor power or of reflex activity. There was such a thing as the academically incomplete lesion—one which showed during its later history that it was not quite complete, but which gave back no useful function, although some slight return of sensibility might be seen.

Although partial lesions revealed their nature at once or in an early stage, he did not wish to imply that they proceeded to complete recovery either invariably or rapidly. But the fact that a lesion was a partial one indicated that the violence which reached the cord was slight, and thus it might be hoped that useful recovery would occur, although a year or longer might elapse before recovery was established. These partial lesions were obviously the only ones which, from the point of view of the cord, were worth operative or manipulative treatment with the object of relieving pressure. Experience of the present war had suggested that partial lesions were of great rarity in both the groups he had named. Dr. Gordon Holmes in his Goulstonian Lectures in 1915 mentioned 300 cases in only forty-five of which were incomplete lesions found. In less than one-sixth of the projectile cases the question of surgical relief of pressure might be considered, and in the majority even of these it was likely ultimately to be rejected.

Injuries caused by Projectiles

In an incomplete lesion the presence of metallic or bony fragments might cause persistent pressure on the cord, and these should be removed. It was rare for metallic fragments to be held up in the spinal canal, for a projectile which had the energy necessary to penetrate the canal or fracture its walls had usually enough left to carry it out again into other tissues. Another reason for removing metallic fragments, irrespective of the position of the foreign body, was the prevention of infection. As an infected track must pass by the cord or meninges, an infected wound was an obvious source of meningitis. When entrance wounds were suppurating freely, as was usually the case, the rule should be to bring the wound to as clean a state as possible by a superficial drainage operation before removing the foreign body. Meningitis in penetrating wounds of the central nervous system was extremely common in neglected cases, but mortality from it was low. In discussing the treatment of the infected focus Mr. Taylor mentioned the new bactericidal drugs, but stressed his view that these were adjuvants to surgical treatment, though he agreed that sulphapyridine had in certain cases cleared up staphylococcal meningitis when no other treatment, not even by lumbar puncture, had been employed.

In at least five cases out of six, transport, nursing, and management of the bladder were the beginning and end of treatment. The primary needs of the patient with the anaesthetic back were distributed pressure, continual changing of the sites of pressure over bony prominences, and cleanliness of the skin. Whereas water beds and sorbo-rubber mattresses permitted all of these, plaster beds invariably gave rise to bedsores.

Management of the Bladder

Finally, Mr. Julian Taylor dealt with the management of the bladder, the most important duty of the medical attendant. When there was retention of urine, which almost

invariably occurred, there were three methods available: regular catheterization, the tied-in catheter, and suprapubic drainage. Each had its disadvantages. For the patient who might recover his vesical function he recommended regular catheterization, and the same procedure for the patient likely to develop automatic micturition. For the patient who was not going to improve or to develop automatic micturition—for example, one suffering from a cauda equina lesion—he recommended suprapubic cystotomy with lavage of the bladder at low pressure. For the patient who had to travel a long distance in an ambulance a catheter tied in and scrupulously arranged was probably the least harmful expedient.

Types of Fractures

Mr. R. WATSON JONES divided injuries of the spine into three groups: compression fractures of the vertebral bodies, avulsion fractures of the transverse and spinous processes, and penetrating wounds of the spine. Investigations he had pursued in recent weeks showed that the surgeons of the Royal Navy, of the Royal Air Force, and of the Emergency Medical Service were faced to-day, exactly as in days of peace, with a very large number of uncomplicated fractures and a very small number of spinal cord injuries. He mentioned a form of fracture almost unknown in this country until twelve months ago. It was called "shoveller's fracture," in which the spinous process was torn off the vertebra by violent contraction of the rhomboid muscles at the moment that a labourer drove his shovel into wet clay or flung the laden shovel into the air. Its recent frequency was among those engaged in excavating shelters, digging trenches, or clearing debris.

Of vertebral body fractures the simple wedge compression was by far the most common. It was likely to be sustained by the dock labourer who fell into the hold of a ship, the window cleaner who fell from his ladder, or the steel erector who fell from scaffolding. In another type of fracture in which the vertebral body was comminuted the injury was usually due to the fall of a weight across the shoulders, as in the case of a miner trapped by a fall of roof. Fracture-dislocation, most often seen in car accidents, was, like comminution, due to acute angulation, but with a traversing momentum which carried the upper segment of the spine forwards so that the spinal cord was often injured. In the Royal Navy the most frequent war injury of the spine was a simple wedge compression of one or more lumbar vertebrae, with or without a fracture of the os calcis. It was often caused by jumping from the deck of a torpedoed ship or by the explosion of a mine below the vessel. In the treatment of these lumbar fractures two points were important: (1) the compression could be completely reduced by hyperextension of the spine by the two-table method, but the limit of hyperextension must be reached; (2) the fully extended position must be maintained by an adequate plaster jacket for not less than three months.

Fractures sustained by Airmen

In the Royal Air Force fractures of the lumbar region might again be sustained as a result of parachute or crash landings, but the commonest fracture was one in the upper half of the dorsal region of the spine. The reason for the localization lay in the fact that the pilot was partly fixed to the back of his seat by a special harness which prevented forward movement of the shoulders, so that if a fighter aircraft crashed the pilot could not double up in the ordinary way at lumbo-dorsal level, but the momentum still tended to carry his head forward, so that the site of angulation of the spine was the upper dorsal region.

The reduction of these high dorsal fractures was very difficult, but for that very reason perfect replacement was relatively unimportant. As the injured vertebra lay in the middle of one of the arms of leverage it was in a relatively immobile segment of the spine, and in such cases perfect function was compatible with definite compression of the vertebra. In treatment the spine was extended as much as possible, and a wing of plaster was added across the front of each shoulder to maintain extension of the upper dorsal region, but not to include the cervical region and head. Immediately after reduction of the fracture hyperextension exercise was undertaken. With such treatment it had been unnecessary to immobilize the spine for more than two months.

Prognosis in the lumbar region was relatively good. More than half the cases of fracture-dislocation at this level with paraplegia made a complete recovery. In the dorsal region, on the other hand, the spinal cord almost completely filled the spinal canal, and recovery from paraplegia was not observed in more than 15 or 20% of cases.

Spinal Injuries in Air-raid Casualties

Mr. Watson Jones went on to say that his inquiries showed that surgeons in the Emergency Medical Service who were treating air-raid casualties had to deal with only a small number of spinal injuries. No doubt the mass of masonry which fell on air-raid victims if sufficient to fracture the spine was also sufficient to kill. The few cases that had occurred had been in air-raid shelters, the roof of which had crashed down on to the shoulders of those within. The type of injury sustained was a comminuted fracture or fracture-dislocation of the cervical region.

In the treatment of cervical fracture-dislocations he emphasized the value of skeletal traction from the skull. This was the safest method of reduction and, moreover, the best method of preventing redisplacement. Skull traction relieved pressure on the cervical cord because it not only reduced the bone displacement but by maintaining a distracting force on the intervertebral spaces it encouraged replacement of retropulsed intervertebral disk material.

All the injuries so far discussed were the flexion variety of fracture or fracture-dislocation, and in conclusion Mr. Watson Jones mentioned the rarer hyperextension injuries, as instanced in a sailor who fell on to the deck of a destroyer and sustained violent hyperextension of the spine, with a traumatic spondylolisthesis, so that all the lumbar vertebrae were dislocated forwards on the sacrum. That particular case when he saw it was several months old and it was impossible to attempt reduction, but he believed that the method of reduction he had described for congenital spondylolisthesis would have been effective if applied at an early date. In this method the patient lay face upwards with head and shoulders supported on a table, the hips flexed to the right angle, and vertical traction was applied to the thighs so that the lumbar curve was flattened and the pelvis pulled forwards. Even in congenital spondylolisthesis improvement of position was possible, and in a traumatic case perfect reduction should be obtained.

Technique of the Plaster Jacket

Mr. K. I. NISSEN said that the experience at the Orthopaedic Centre, where in most of the cases received the injuries were at least a fortnight old, was that every plaster jacket had to be removed either immediately or within the first week, on account of faulty technique in its application. In some cases there was incomplete hyperextension and in others incomplete or faulty padding, while a number of plasters were rendered ineffective by excessive trimming above the pubic region and also low down on the sternum. For obtaining hyperextension he had found of great service a sling made of stout canvas about 4 in. wide with padding of 1,4-in. felt, but with the padding completely removed over the front part of the sternum and replaced by some soft materials, such as chamois leather. The sling was used to take the strain off the arms, multiple injuries of which hindered the application of the plaster jacket. He stressed the need for carrying out suprapubic drainage high rather than low in the abdomen. If such drainage were attempted it should be, particularly in a cauda equina lesion, 1½ in. above the pubic crest. He added that the amount of reduction obtained in the cases of spinal fracture which had come to the centre had been most disappointing. If a week had elapsed after the injury, every day diminished the chance of getting a satisfactory reduction, and after two or three weeks the possibility had practically disappeared. The plaster jacket then served the purpose of splintage and not its primary purpose of facilitating complete reduction.

reference was also made in an annotation in the *Journal* (February 22, p. 284), it becomes evident that an embolism may reach the brain from a pelvic or femoral site without passing through the pulmonary circulation. Batson outlined a vertebral system of veins, which have free and valveless communications with those of the pelvis, abdomen, thorax, thoracoabdominal wall, and with the intracranial venous system, and in which there is a frequent reversal of flow. Radio-opaque material injected through the dorsal vein of human cadavers was seen to pass from the pelvic veins to those of the cerebrum without entering the lungs. These results are of the greatest value and serve to clarify a common problem—the mode of blood spread of tumours and inflammatory masses in the absence of secondary deposits in the lungs and of a patent foramen ovale.—I am, etc.,

London, W.1, March 8. J. SHAFAR, M.D., M.R.C.P.

Influence of Heredity on Breast Cancer

SIR,—In your report on the work of the British Empire Cancer Campaign (March 1, p. 329) part of the summary by Mr. J. P. Lockhart-Mummery of the seventeenth annual report of the Campaign is quoted. It reads: ". . . Although it has been known for some time that heredity can influence the incidence of breast cancer in mice, this should not be applied too closely to the problem in man, because the conditions of mating necessary to demonstrate the effect in mice—for example, very close inbreeding, necessitating brother–sister mating—never obtain in any civilized community." It is important for those interested in this problem to realize that when using highly inbred mice to elucidate the factors concerned in the genesis of breast cancer, all that is done is to exaggerate and concentrate certain characters which are normally present but widely dispersed in any mixed stock. Thus factors which would otherwise be lost to view can be studied and influenced at will in many individuals. The mouse is chosen because of its short life span and rapid powers of reproduction, but similar results can be obtained in the rabbit.

No one would deny that the Mendelian laws are as applicable to the human as to the tall and short peas which Mendel used in his original experiments. Yet Mendel could not have formulated the laws if he had not studied an obvious character in a quickly growing plant. Similarly, in the study of breast cancer the use of inbred mice is an invaluable aid to the elucidation of the problem in man. I am prompted to offer this point of view as a reply to the question as to whether it is justifiable for those engaged in cancer research to spend a great deal of time upon experiments in mice. I think it is.—I am, etc.,

University of Leeds, March 7. GEORGIANA M. BONSER.

Muscular Lesions in Somatic Pain

SIR,—I fully agree with Dr. Michael Kelly (March 8, p. 379) in impressing on the general practitioner the great and widespread incidence of muscular lesions and their importance in the treatment of patients complaining of pain the origin of which appears to be obscure. I, too, have stressed this very point in my papers. I also agree that our present conception of the origin of pain will have to be revised in a radical way. But it appears to me that in the first instance we have after R. Leriche (*The Surgery of Pain*, 1939, p. 28) to distinguish between experimental pain as produced in the laboratory by neurologists, and symptomatic or *ut venia verbo*—pathological pain as occurring in diseases. On the other hand, the latest experiments of Sir T. Lewis and collaborators by injection of hypertonic saline into the muscles produced pain which seems to be related to, although not identical with, symptomatic pain, in which doctors are naturally much interested. In my opinion pathological pain is caused by abnormal vasomotor reflexes of parasympathetic (?) or, more likely, of sympathetic origin leading to a "vascular disequilibrium" (Leriche). A close study of the literature on visceral and referred pain seems to point in the direction that pathological pain is very often a sympathetic phenomenon.

If Dr. Kelly and other authors complain that their results regarding muscular lesions are inconsistent and the patients sometimes cannot be cured, it is, in my conviction, due to incorrect diagnosis. An extremely important point is the fact that the diagnosis of muscular lesions can by no means be based only on local tenderness or nodules. This is evident from Dr. Kelly's remark that "these situations" (namely, in the muscles) "are tender in the normal subject." In my experience a muscular lesion may be diagnosed only by the presence of "myalgic spots," the objective signs of which are described in the *British Journal of Physical Medicine* (1938, n.s. **1**, 302, and 1940, **3**, 50). A recent article (*Practitioner*, March, 1941, p. 167) describes the sites of the myalgic spots in all common myalgias of rheumatic, traumatic, and idiopathic origin. In addition it is to be noted that the myalgic spots are as a rule situated in anatomical points—namely, the origin, insertion, along the edge or along the course of a muscle. A second diagnostic point worth mentioning is the fact that the areas of referred pain complained of by patients are not arbitrary but seem to be governed by a law. Taking into consideration the sensory innervation of the skin in relation to spinal nerves—these so-called dermatomes—the pain is referred, at least approximately, to a skin area supplied by one or more spinal nerves which innervate the muscle producing it (*Lancet*, 1940, **2**, 326). In this way the area of pain as mapped out by the patient himself is a reliable guide in localizing the myalgic spots in the individual patient.

If proper care is given to these points and the sites of the muscular lesion are accurately located the results will, I am confident, be gratifying.—I am, etc.,

London, N.W.11, March 13. MICHAEL G. GOOD, M.D.

Analysis of Sulphonamides in Blood

SIR,—The successful therapeutic use of the sulphanilamide drugs frequently necessitates their accurate determination in the body fluids, especially the blood. The Bratton and Marshall method generally used for these analyses gives accurate results with sulphanilamide, slightly low results with sulphapyridine, and lower results with sulphathiazole. The mean analytical recovery from blood to which 5 mg. of sulphathiazole per 100 c.cm. was added is 89.03% if the blood is haemolysed in 1:20 dilution and 94.82% in 1:50 dilution. If, however, haemolysis is prevented by diluting the blood in 0.85% sodium chloride instead of 0.05% saponin or water, the recovery from 1:20 dilutions is increased to 93.88%, and the recovery from 1:50 dilutions to 99.95%. The analyses of blood from patients receiving sulphanilamide, sulphapyridine, or sulphathiazole show that the recovery of sulphanilamide from aqueous and saline filtrates is approximately equal. Saline filtrates of the blood from patients receiving sulphapyridine give a slightly higher recovery than aqueous filtrates. In the case of sulphathiazole saline filtrates give results significantly higher than aqueous filtrates. When aqueous and saline filtrate analyses of sulphathiazole are divided by the appropriate *in vitro* mean recovery values, the 1:20 dilution aqueous and saline filtrate results agree within 7 parts in 470, and the 1:50 aqueous and saline results within 7 parts in 650.

It is evident, therefore, that the complete haemolysis recommended by Marshall and his associates as essential to quantitative recovery makes no appreciable difference in the recovery of sulphanilamide and is to be avoided if precise analysis of sulphapyridine and especially of sulphathiazole is desired. Detailed data upon which these conclusions are based will appear in the *American Journal of Clinical Pathology*.—We are, etc.,

FRANK B. COOPER, M.S.
PAUL GROSS, M.D.
MARION LEWIS.

Pittsburgh, U.S.A., Feb. 11.

Agranulocytosis after Sulphapyridine

SIR,—I should like to report this case of agranulocytosis following only a short course of treatment with sulphapyridine.

A patient of mine, a male aged 26, was taken ill suddenly with severe sore throat, high temperature, and vomiting while on a visit to the country. He was seen by a local doctor. The following day he became worse and he was admitted to a local institution. Sulphapyridine was administered, apparently

with the idea that he was suffering from a severe infection, but there was no improvement in his condition. I went to see him and found that he recently had had a course of sulphapyridine for gonorrhoea. He had treatment for two weeks terminating one week before the onset of his acute present symptoms. Ever since he commenced the treatment he complained of weakness, pain in his limbs, and giddiness. When I saw him, four days after the onset of his acute condition, he looked extremely ill, emaciated, temperature 101°–103° F., with grunting respiration. He complained of sore throat, dysphagia, and weakness. The throat was covered with an extensive slough. I suggested a blood count, which revealed the extremely rare figure of one polymorph per c.mm. Blood transfusion was administered, but unfortunately ten days after the onset of his illness the case proved fatal.

Though this complication is well recognized, I feel that this case should be recorded in order to be on guard even when administering a short course of sulphapyridine.—I am, etc.,

London, E.1, Feb. 28. J. DYWIEN.

Scabies and Subnormal Intelligence

SIR,—I have read with interest the article on the incidence of scabies and its apparent dependence upon subnormal intelligence by Captain Geoffrey Hodgson in your issue of March 1 (p. 316). With experience as a former medical officer in the Navy and subsequently as medical superintendent of a colony of over 400 *male adult* mental defectives I may be permitted to make some observations. No doubt scabies does show greater frequency in those with low intelligence. Where good hygienic conditions are enforceable, as in the Services, infection is generally introduced to the community of men through the same source and by the same type of men as venereal diseases and pediculosis. During the period 1926–36, at all events in the Navy, this source was, both at home and abroad, the inferior types of brothels and shore-side lodging-houses. Only the less intelligent men expose themselves in such places.

From the last sixty new admissions of adult male mental defectives here, all rate-aided and many certified from magistrates' courts, three were found to have scabies. In each case the condition had become resistant to treatment, impervious to improved bodily hygiene, and had ceased to be a source of any discomfort or irritation. The three defectives concerned are fairly typical of the vagrant class and the petty criminal products of our lowest social stratum. It is likely, then, that Captain Hodgson's investigations will prove the relationship he sets forth. As a result, certain subnormal elements will be weeded out from the Forces as a source of impediment to efficiency. A situation will then arise whereby such elements will be returned to their homes to propagate (and their proclivities in this direction are recognized), while those elements from whom propagation should be encouraged are partially or wholly withheld from home facilities.

It would appear desirable, therefore, that the elements so weeded out should be divided into two groups representing two degrees of mental subnormality. Those who are graded "dull" should be retained in special labouring units of the Forces, while those whose intelligence coefficient is so low as to constitute certifiable mental deficiency should be so certified and, if returned to their homes, put under the visiting supervision of their local authorities, or, where possible, admitted to colony segregation. Failing such precautions the proportionate increase of sibs from defective stock would be given a flying start at a time when soundly parented children will be most desirable to the nation in its recovery from war.—I am, etc.,

March 7. J. JOHNSTON MASON,
Medical Superintendent, Brentry Colony, Bristol.

Scabies Treatment in General Practice

SIR,—Captain Geoffrey Hodgson (March 1, p. 316) has shown by intelligence tests what one has always believed to be true—namely, that the patient with low-grade intelligence is the one most likely to get scabies. How does this knowledge affect treatment of scabies in general practice? The patients rarely have bathrooms in their houses, and "a large number of scabietic patients have dirty clothes, dirty skins, and dirty habits." They cannot all be sent to hospital, and because of their low standard of intelligence they can rarely be relied upon to follow instructions for treatment in their own homes. I believe treatment can best be done by the practitioner in his own surgery with "rotenone" solution, as it takes only some five minutes compared with benzyl benzoate treatment, which takes half an hour (*Pharmaceutical Journal*, March 8, p. 79).

In the last three months I have during surgery hours painted with rotenone [which is a constituent of the plant derris] some fifty patients varying in age from 7 months to 75 years, and including three pregnant women. At the first consultation the patient is told to return after having a bath and to bring a clean towel. In front of a fire the patient is painted with a two-inch paint or varnish brush from neck to feet. The towel is used to cover a stool upon which the patient stands. A more important reason, however, for asking the patient to produce a clean towel is that this usually necessitates some clothes washing, which is all to the good. During the painting one has a chance of mentioning the need for frequent bathing, for clean clothing, and for changing of clothing. Possibly, as the one means of relieving the overworked general practitioner, the first-aid posts might be used as centres for treatment under suitable medical direction. I have been agreeably surprised at the good results and the unexpected co-operation of these patients. Many have brought other members of their family, bathed and with clean towel, without making any appointment, and I suggest that the local authorities might print a sheet of instructions which the practitioner could give to his scabietic patients.

I use rotenone 1% B.D.H. or 2% rotenone (sarevan, Evans) depending on how I feel regarding the case. The number of paintings required averages between three and four. There are a few return cases, probably reinfected, who, on instructions, come back immediately itching begins—always bathed and with clean towel—and who do not wait until a large area of the skin is affected. Patients get ready in an adjoining room while surgery is proceeding. For the patients who cannot pay the necessary repeated visits on *consecutive* days—for example, constant overtime munition workers—Evans Sons Lescher and Webb Ltd. made for me in December, 1940, a 2% rotenone ointment. This has been successful in the very few cases so far treated, and I hope to try this out further.—I am, etc.,

Newcastle-upon-Tyne, March 12. S. CALLER.

Medical Woman-power

SIR,—One reads week by week of the difficulty of allocating medical man-power for Service needs, but one looks in vain for mention of medical woman-power. In the last war medical women of my generation served the civil and military hospitals at home and abroad and helped in general practice. When hostilities ceased and men returned many of us married and retired from practice, and have spent the intervening years home-making and rearing families to take their places in the present struggle. Now we offer our services again only to find ourselves unwanted; a recent letter from the Central Medical War Committee informs one that "only a very small demand has been made for women practitioners." Last summer a Local Medical War Committee invited me to accept a post as medical officer to a hospital for evacuated children suffering from minor ailments—surely a suitable job for a medical mother—but the Government medical officer with whom rested the final appointment refused to employ me on account of my female sex.

It is not generally recognized that the practice of medicine being a "reserved occupation," women doctors may not join the women's auxiliary services to the Army, Navy, and Air Force. The only medical work open to women, therefore, is to render assistance in general practice.

To me it seems wrong and foolish that this body of trained and experienced women accustomed to responsibility and comprising, moreover, about one-tenth of the entire medical profession should be side-tracked into the alley labelled "assistant for the duration," where useful work is being done, but work

which calls for these same qualities of physical endurance required by the men and women in the fighting and auxiliary services, and for no other reason than archaic sex prejudice in high places. I do not suggest that women should replace men as battalion medical officers, but there must be many administrative posts which could be filled by women, and certainly the demands of the members of the auxiliary services for women medical officers should be met. One anticipates with interest the report of the Committee on the Allocation of Medical Man-power which Mr. Brown has promised will be published shortly.—I am, etc.,

Tutbury, Staffs, March 3. MARY E. COCHRANE-DYET.

Vision Standards for Grading Recruits

SIR,—I have found the following details of such great service in saving time and worry that I thought other examiners might find them useful:

	R.E.	L.E.
Grade I Standard I: Unaided vision	6/6 6/6 6/9	6/6 6/9 6/6
Grade I Standard II: Unaided vision	6/9 6/9 6/12 6/12 6/12 6/6 6/6 6/6 6/6	6/12 6/9 6/6 6/12 6/9 6 12 6/18 6/24 6/36
Grade I Standard III: Unaided vision less than II but vision can be corrected to at least Standard II. If below 6/60 either eye—specialist. All men not placed in Standard I, II, III, refer to specialist.		
Grade I Standard IV: Unaided vision is less than II but vision cannot be corrected to Standards I or II but can be corrected to	at least 6/12 or 6/36 6/18 6/24 6/36 6/9 6/9 6/9 6/18 6/24 6/36 6/12 6/12 6/12 6/18 6/24 6/36	at least 6/36 6/12 6/6 6/6 6/6 6/18 6/24 6/36 6/9 6/9 6/9 6/18 6/24 6/36 6/12 6/12 6/12 6/12

	R.E.	L.E.
Grade II (a) vision Standard V: Vision can be corrected to at least 6/24 in each eye.	6/18 6/18 6/24 6/24	6/18 6/24 6/18 6/24
Grade II (a) vision Standard VI: Vision in one eye, with or without glasses, is not less than 6 12 and in the other is less than 6/36 with or without glasses, or has been practically lost.	6/6 6/9 6/12 6/60 or less 6/60 or less 6/60 or less 6 60 or less	6/60 or less 6/60 or less 6/60 or less 6/6 6/9 6/12
Grade IV Standard VII	6/18 6/18 6/24 6/24 6/36 6/36 6/36 6/36 6/60 or less 6/60 or less 6/60 or less 6/60 or less 6/60 or less	6/36 6/60 or less 6/36 6 60 or less 6/18 6/24 6/36 6/60 or less 6/18 6/24 6/36 6/60 or less

—I am, etc.,

West Kirby, Feb. 26. A. STANLEY PARKINSON.

"Give Us the Tools"

SIR,—"The general practitioner is the backbone of the country's health services" . . . we know that. We have heard it a thousand times, almost *ad nauseam*. The infantry is the backbone of the Army, but do we send our infantry into battle armed with bows and arrows? Somebody, the infantryman himself, would have something to say about that! Yet the general practitioner, having been trained in his school to the use of the technical developments of medicine which are in routine use, is sent out to fight in practice with a little leather bag! Oh yes! He can certainly obtain the advice and help required for his patients from the specialists and the hospitals, but he himself is barred from the fun of the game, and from exercising the skill and knowledge he acquired during his years of training and in his hospital appointments. In time, through lack of familiarity, the laboratory and the *x*-ray department become to his mind either awe-inspiring concerns which, like the slot machines, deliver ready-made diagnoses in return for hard cash, or they seem unnecessary and cumbersome complications of the modern machine-mad world. Some of his patients do not come back to him; some regard him as only fit to treat the minor disorders, not the real illnesses. Hence, after a few years of struggle and an increasing sense of frustration, many give it up, and really do become doctors only fit to treat the most minor disorders; and who can wonder at it?

The statement that clinical sense and not the laboratory aids reigns supreme in medicine is just reactionary nonsense *if it implies* that the aids to diagnosis are luxuries with which the "good practitioner" can dispense. The practitioner can perceive anaemia, discover glycosuria, hear a cough, record fever, and suspect cystitis. He can feel the irregular irregularity of the pulse, but he often cannot make the diagnosis without the aid of the laboratories and other special departments. But instead of having direct approach to these essentials he has to refer his patients to the specialist at an out-patient department at a hospital! The evils resulting from this are progressive. It is a serious thing if the backbone of the medical profession suffers from osteomalacia!

The system is bad, too, for the specialist, who has to deal with a glut of easily diagnosable disorders (given the necessary facilities), and cannot devote enough of his time to the few cases which really call for his skill. Anyone who has seen rows and rows of patients on hard benches at the hospitals will pity both the unfortunates sitting there and the physician or surgeon who, somehow or other, has got to "get through them." Finally it is bad for the patient, and medicine exists for the patient—not vice versa! He wastes time, and time is vitally important to the working people—so important that many will not report to their doctors or attend the hospitals until they are seriously ill, when curable disorder may have become incurable disease. Furthermore, it cannot be good psychologically for the patient to lose confidence in his doctor and go for treatment to the hospital.

The logical remedy for this state of affairs is apparent. The practitioner must have direct approach to the more common aids to diagnosis. I don't want to equip my infantryman with a tank: the specialist handles the tank, just as our specialists handle the cysto-, gastro-, and bronchoscopes, need calcium balances, and employ bone marrow investigations. But he must have a bayonet, a grenade, and a tommy-gun: he must have immediately available blood counts, blood ureas, blood sugars, sedimentation rates, sputum tests, microscopical and simple cultural examinations of the urine and faeces, and there must be an *x*-ray plant with a competent radiographer and radiologist, and possibly an electrocardiograph, at his service. And just as the Army has its Service corps, so should the practitioner enjoy the services of a trained nurse who could collect and examine specimens, take and record weights, prepare and sterilize instruments. The doctors should shut down their surgeries at their houses. They should be grouped together at a building where all these facilities are available. Here, too, would be their minor operation theatre, their mess-room, and their library. Co-operation and discussion would raise the standard of professional achievement, and those on the councils who deal with health problems could learn at first hand what the doctors need. The bad old times of "everyone for himself and his little leather bag" must go. And they will only go if the younger, more alive members of the profession, including medical students, residents, and the men in the Services, clamour and demand that they shall go. We must make a vociferous nuisance of ourselves that we may be given the tools with which to work. Only with the tools can we accomplish our task.—I am, etc.,

London, S.E.13, March 6. E. MONTUSCHI.

Mobile Unit in Action

SIR,—Your correspondence recently has revealed such a wide diversity of opinion regarding the utility of mobile first-aid units that I am prompted to contribute our experience.

Our particular unit has been called out to ten incidents, and has treated over fifty casualties—not many perhaps, but it is in the quality rather than the quantity of our work to date that its chief merit resides. Our casualties almost without exception have been trapped under debris for periods varying from one to nine hours. We have been able to improve their chances of survival by: (1) our facilities for shock and wound treatment while they were trapped and after they were rescued; (2) proper supervision of the final stage of the rescue operations, ensuring by accurate diagnosis and appropriate precautions that neither their injuries nor their shock were aggravated

by hasty removal or careless handling; (3) detaining them at our operational centre (a hall or a house adjacent to the incident) until they were sufficiently recovered from shock to undertake, in the case of hospital casualties, the ambulance journey—itself a shock-producing factor; and (4) a correct classification of the nature of their injuries, evacuating them accordingly to hospital, first-aid post, rest centre, or home.

This last function ensures for the casualty the appropriate treatment which his condition demands, and for the casualty services economy of both time and effort by an intelligent distribution of casualties among the various branches of the services. By "intelligent distribution" I mean that casualties are not, as a previous correspondent has remarked, "whisked off to hospitals without any attempt being made reasonably to segregate them." The same correspondent attributed this fault to "the hard-worked ambulance services." This is not so; it is due to the absence of any discriminating classification of casualties by the stretcher parties. Casualties when extricated are in what appears to be a ghastly condition: covered in dirt, dishevelled, and generally in a state which suggests one course of action—hospital. But often even a cursory examination at a mobile unit operational centre reveals that the injuries are negligible, and they respond very well to shock treatment. Stretcher parties working under black-out conditions are in no position to undertake such an examination. Further, by dispatching casualties to hospital immediately they are relieving themselves of any individual responsibility in the matter of "reasonably segregating" them. The result is to encumber the hospitals with casualties who could equally well be handled by first-aid posts.

One other important point about the work of our unit at incidents is that on several occasions one man has been assigned from the unit to act as incident doctor's deputy while the remainder of the personnel have been coping with casualties at the operational centre. This man's job is threefold. He works in conjunction with the rescue and stretcher parties, ensuring that: (*a*) no casualty is carelessly handled—that is, removed from the debris before a thorough examination of his condition has been made, and appropriate precautions taken not to aggravate his injuries; (*b*) as soon as a casualty is accessible, which often happens some time before he can be extricated, such shock treatment as is required is immediately provided and continuously maintained; (*c*) a check is kept on the number of casualties rescued in order that at any stage in the operations an accurate figure is available of the casualties still to be rescued. Concurrently with this strictly "*mobile*" work we have, since we were first established, been augmenting a fixed first-aid post, and have shared the work of treating the post's 240 casualties. Actually the personnel of each post has been trained to do the work of the other, so that they are largely interchangeable.

Naturally the scope of the unit's operations has been determined to a great extent by the severity of the air raids upon this borough, although we could possibly have been used more often. In view of the close approximation of our own average of casualties per incident to the general, it is reasonable to surmise that our experience is the rule rather than the exception—an impression which is reinforced by the account of Southwark's mobile work published in the *Journal* in January (p. 99). I should be interested to know how Southwark's mobile unit is called out; whose specific responsibility is it to send for the unit: wardens', stretcher parties', or Control? Our experience has, however, sufficed both to prove the real necessity for a unit and to testify to the ability of the unit to meet that need. True, some of our functions could equally well have been performed by a smaller unit. But on the other hand there are many boroughs, this included, which have no smaller units, and such experience as we have had has provided first-class training for our personnel to cope with graver emergencies. Again, these smaller units would have to be ancillary to the larger ones, since the larger units have their own definite role in the scheme of the casualty services; and as the larger units are, in our experience, quite successfully doing the job of the smaller ones there is little reason why they should not continue to do so. Any talk of replacing the larger units by smaller ones seems to betray a complete lack of appreciation of the facts. While, as I have admitted, some of the work of the larger units could be done by the smaller units, the reverse does not apply. The larger units, I repeat, have their own definite role in the casualty services—the role of mobile first-aid posts—and so long as the possibility exists that a borough may be "Coventrated," with hospitals and fixed first-aid posts put out of action, so long do the mobile units justify their existence as the first line of reserves of those services. In conclusion, I might add that the work of our unit has been granted no small measure of official recognition by the award of the George Medal to its nurse-in-charge, Sister M. F. Thomas, S.R.N. It was due largely to the work done by her in administering morphine and shock treatment "under the most hazardous conditions" to two trapped casualties that their lives were saved. Use these units more and they will save more lives.—I am, etc.,

F. J. HENLEY,
March 2. M.O., Woolwich Mobile Unit No. 1.

Delay in Treatment of Air-raid Casualties

SIR,—In the *Journal* of February 22 (p. 273) Dr. Margaret Ball and Mr. George Quist discuss a series of forty-three casualties, all apparently the result of one air raid and admitted to the Royal Free Hospital within a short space of time. Three of the patients later developed gas gangrene, and two of these had waited seven hours between admission and operation because of the large number of urgent theatre cases. The authors regard this delay as an important aetiological factor.

This instance of one hospital's receiving so many casualties that serious delay in treatment is inevitable is not an isolated one. It appears to be usual in London for ambulances to take all patients from one "incident" to one hospital, generally the nearest one, while another hospital less than a mile away may have no admissions. This policy of the London ambulance authorities is bound to result in delay in treatment. Many patients have multiple injuries, and they may require over an hour each in the operating theatre, with the result that the wounds dealt with at the end of the list have infection already established. In order to enable treatment to be undertaken at the earliest possible moment the casualties should be distributed to several hospitals and not all taken to the nearest.—I am, etc.,

NORMAN WHITE.
University College Hospital, London, W.C.1, March 11.

Shelter Policy

SIR,—With reference to Dr. Bushnell's letter (March 8, p. 381) on shelter policy, I would like to put forward certain considerations, although I feel doubtful whether even at this late hour any effective challenge will be made by a large body of the profession, or would have much effect if made. The great majority of medical men are not interested in shelters; they are too occupied with their own business. The official view would be that we are sufficiently represented by the Horder Committee, and those who disagree are usually accused of being some kind of "-ist." The B.M.A. has not moved in the matter in any representative manner, either centrally or locally; in any case there would be differences of opinion among its members.

As we have been told, the official policy of the Government, followed by local authorities and reflected in the Horder Committee (or at any rate stated by Lord Horder), is to encourage "dispersal" and its corollary "domestic shelters"; therefore it does not believe in the necessity or practicability of bomb-proof shelters. The stress laid on fire-fighting, and the urging of the population to stay in their houses, protected by Andersons, Morrisons, and cellars, is said to enhance morale. That mothers, children, and the aged should be exposed to the risk of being killed because this is good for morale may sound fantastic, but seems a logical conclusion from the premises—even if they are all evacuated, for there are few shelters in country districts.

After the November raids many hundreds if not thousands of the population in heavily bombed areas evacuated themselves nightly, often on foot, either to shelters in the suburbs (otherwise unused) or to fields and hills miles from this city. The morale of these people is splendid, let there be no mistake about that; but prolonged, intensive raids are more than flesh and blood will stand. Yet these people are being provided with small brick surface shelters in backyards. In fact, policy appears to be dictated by doctrinaire-theory rather than by

observing what happens or taking into account the psychological needs of the situation.

I am not saying that the official policy may not be right, but merely implying my own views or prejudices in the matter and stating certain facts of observation in one locality. There is always a certain amount of "projection"—of personal instinctive and acquired reactions and sentiments—in whatever policy anyone holds, but the still small voice of reason can prevail—if re-echoed long and loudly. Therefore one can but hope that medical men who are not satisfied will join in putting forward the physiological and psychological needs of the population, with insistency, to the authorities; as you, Sir, and Sir John Orr have suggested is our duty.—I am, etc.,

Birmingham, March 10. CHARLES BURNS.

Optimum Calcium Requirements

SIR,—Miss Leitch has challenged our contention that arteriosclerosis is prevalent among the affluent classes. Here is our reference: *Arteriosclerosis*, by Edmund V. Cowdry, Macmillan, 1933, p. 226. That calcium affects renal function is an established fact apart from the formula. Our rabbit experiments comprising considerable material will be published later, and more details will be found in the report of a parallel investigation due to appear somewhere else. The idea that people under low calcium intake may suffer from some occult disease which nobody can detect is too fantastic to deserve a moment's consideration.

Large retention of calcium is a peculiarity of middle age. Similar results were obtained by us with regard to protein retention. Our table consists of averages, and individual high faecal calcium was submerged in the averages. But the main reason for a low faecal calcium is a large retention. Only when calcium is no longer absorbed does a large percentage pass via the faeces. We have had a great deal of experience of this type of work, as our various publications show. Children and pregnant women require other items of food as much as calcium, which can only be supplied by milk. The latter cannot be replaced by bread calcium. The fortified loaf concerns only the adult population, which requires but little calcium.

Now to the core of the problem. It is quite impossible for a person to remain in a negative calcium balance permanently without exhibiting definite evidence of calcium deficiency. It is certain that the whole adult population of this country who do not exhibit calcium deficiency are in calcium balance whatever their intake may be. Calcium minima obtained by experiment depend to an important extent upon the amount of calcium the subject is in the habit of taking. It is very likely that when the calcium intake is low some kind of conserving mechanism becomes operative. True minima of calcium requirement are unknown. These can only be obtained by prolonged clinical observation. As far as optimum requirement is concerned, an amount which fills the reservoirs and supplies the daily needs will, when saturation is attained, supply more than the needs, and a part of the surplus will leave via the kidneys. The latter organs will therefore work unnecessarily and calcium will be circulated in the blood, already saturated—a factor which favours deposits.

The vital problem arises whether a calcium intake which just meets requirements and does little towards filling the reservoirs, or one which fills the reservoirs to overflowing, or one which is between the two extremes, is the ideal. No data whatever are available to judge which is the best, and the choice of one or the other is merely arbitrary. Only prolonged clinical observation can show which is the ideal. We find a similar phenomenon with regard to the fat reservoirs. Clinical experience has taught us that the average expectation of life of those who fill these reservoirs to full capacity is much below that of those who consume only sufficient to cover the needs.

The investigator does not know the real minima. He does not know whether the amount of calcium necessary to fill the whole or part of the reservoirs or which leaves them empty is the ideal. He does not know whether the marginal safety calcium is necessary at all, for there may be as much danger in too much as too little calcium, and the figure of 50% of marginal safety is purely arbitrary. It will be seen that when these experts in language of the exact sciences tell us of the exact ideal calcium requirement per lb. weight they deceive themselves and deceive us. Theirs is a dangerous form of ignorance, for they do not know that they are ignorant. The requirement figure is artificial, unsupported by any evidence, and to estimate calcium intake by money income is not a method to be used in exact science. No direct experimental evidence whatever is available that a section of the community is under a permanent negative calcium balance. A number of unknown quantities are strung together and a heavy superstructure is built on this insecure foundation. It is sheer lunacy that such a far-reaching scheme as entailed in the Government's proposals should be set up on such a flimsy basis. The type of laboratory work under review, if correlated with clinical findings, has a limited value. If not checked by clinical observation it becomes a fantasy without value. In my view it is a grave public scandal that millions of perfectly normal, perfectly healthy adults should be compelled to consume extra doses of such a potent substance as calcium for no reason whatever. A large number of middle-aged people who exhibit evidence of kidney damage, etc., would suffer injury from this extra chalk. In my view it would be discreditable to our profession if we tolerated these proposals; and I appeal earnestly to the Medical Research Council to pause before committing themselves to this criminal folly.

I want from your correspondents a simple answer to a simple question: What is the percentage of the adult population who suffer from calcium deficiency which can be detected by any known method, clinically or in the post-mortem room? The proposal could only be justified if a considerable number of the adult community show evidence of deficiency.

Sir, you are aware that the Government proposals have nothing to do with this war. They have been proclaimed as a great reform which would make us all healthier. In my view the added calcium can serve no useful purpose, for it cannot replace milk.—I am, etc.,

Liverpool, March 1. I. HARRIS.

*** In a leading article on February 22 (p. 281) we made it plain that in our opinion the proposed addition of calcium to flour in wartime was a sound nutritional measure. We must disagree again with Dr. Harris, and suggest to him that a large retention of calcium is not a peculiarity of middle age, and that there is no proof at all that "a large number of middle-aged people who exhibit evidence of kidney damage, etc., would suffer injury from this extra chalk." Dr. Harris states: "Children and pregnant women require other items of food as much as calcium, which can only be supplied by milk. The latter cannot be replaced by bread calcium." If this sentence means that milk calcium cannot be replaced by bread calcium, it is wrong. If it is taken to mean that milk itself cannot be replaced by bread calcium, we would point out that no one has ever suggested the contrary. In view of the malnutrition which has existed among the poorer sections of the population, and which war conditions may easily aggravate, we find entirely misleading Dr. Harris's statement that "it is a grave public scandal that millions of perfectly normal, perfectly healthy adults should be compelled to consume extra doses of such a potent substance as calcium for no reason whatever."—ED., *B.M.J.*

Invalid Diet and the Egg Shortage

SIR,—I am concerned about the country's production, or rather elimination, of that outstanding article of an invalid's diet—the egg. Since meat for beef tea is difficult to obtain, though the meat ration may be sufficient; since fruit is scarce and fish prohibitive; since milk prices have turned that commodity into a luxury, should not some encouragement be given to egg production? While large mixed grills are still obtainable in London restaurants the invalids and convalescents in home surroundings have a thin time.

Eggs cannot be imported to any extent. Poultry stocks through lack of feeding-stuffs have to be reduced to one-sixth. Poultry farmers who have specialized in the economic production of eggs and table fowls go out of business. A reduction from 3,000 hens to 500 ensures this. Locally raised poultry food must to some extent be in the hands of mixed farmers

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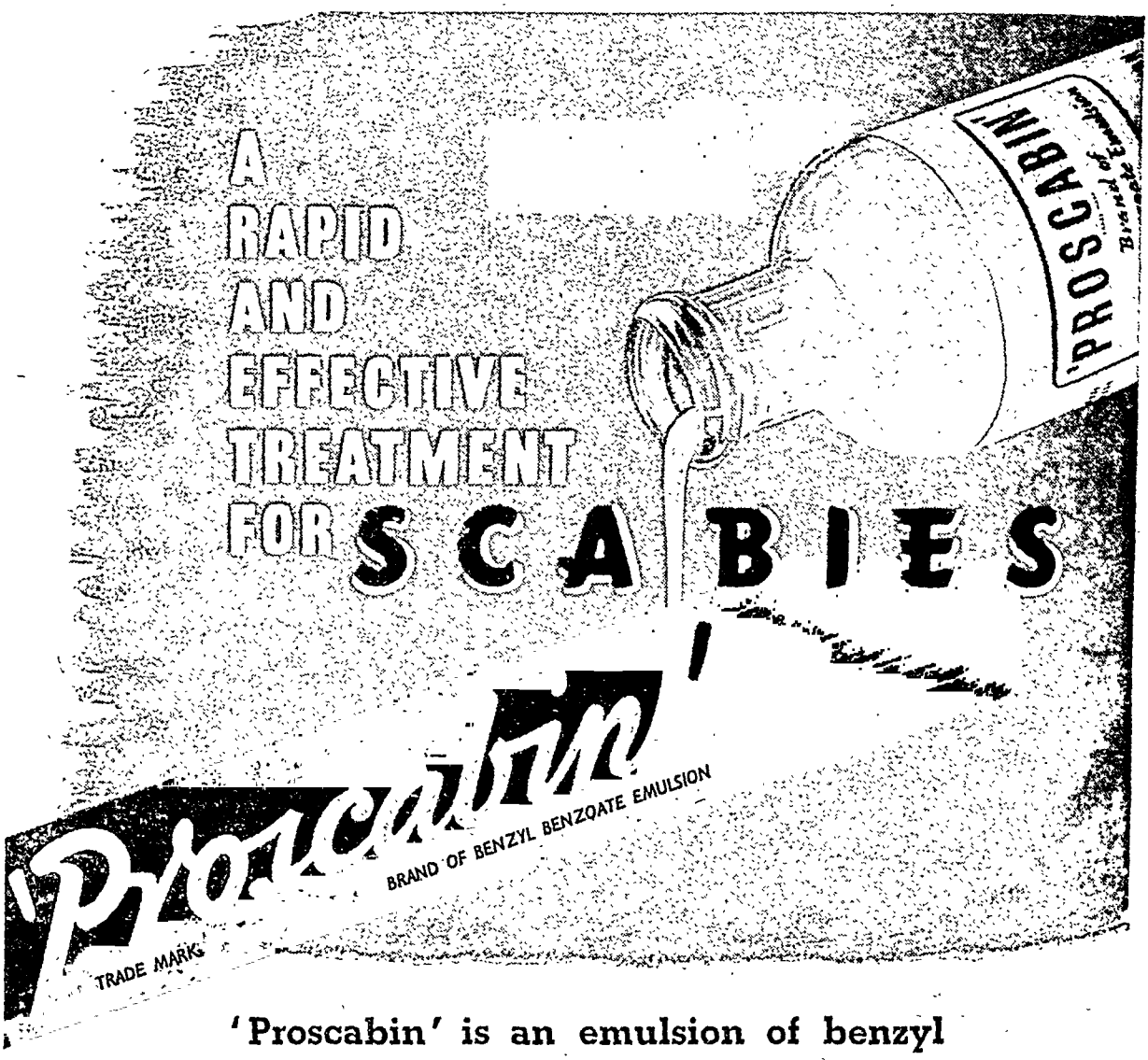
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(as opposed to poultry specialists), who will eventually produce most of the eggs available in the country on non-economic lines. How many of these will filter through to invalids, hospitals, or even to the town-dwelling working man, who might welcome a fried egg on his meatless day, this year will show. In the meantime, will not our profession show some mild interest in the fate of the hard-working pullet?—I am, etc.,

Hexham, March 10 RICHARD BELL

Supplementing the Dietary

SIR,—In the *Journal* of March 8 (p. 381) Dr. Joseph Jones writes especially with regard to the shortage of protein. Is there any reason why separated milk should not be used? A cheese used to be made from it in Dorset which was sold at the very low price of 3d. a pound. In the form of dried separated milk its use was strongly advocated by Mr. Eustace Miles. Casein is the only, or an important, constituent of various well-known advertised preparations. Its value is equal to that of any form of lean meat, white fish, or fowl. It is used unfortunately in industry for the manufacture of various articles which simulate those made from pottery or bone; its use as a food would seem much more important.—I am, etc.,

Bournemouth, March 10. F. C. BOTTOMLEY

Natural Bran in the Treatment of Constipation

SIR,—Dr. Parkes Weber points out in your issue of February 15 (p. 252) that the Government's prohibition of the manufacture of prepared bran will cause hardship to those sections of the community who depend on this product for the prevention of constipation. The following may therefore be of interest.

I have used natural unprepared bran in the treatment of constipation in the Royal Navy for at least ten years. It has invariably been successful, provided the dose has been maintained at an adequate level. Indeed, by the laws of Nature it *must* be successful. I can only say, as regards the reported resistance of "spastic" cases of constipation to cellulose-stimulation, that I have not found any such cases when using natural bran; any failure has always been due to inadequate or irregular dosage.

The dosage varies (*a*) with the individual, and (*b*) with the amount of cellulose taken in the food. As regards item (*a*), it may be noted that the more northern the race the less cellulose is taken in the food, owing to the progressive diminution in plant life that occurs, and vice versa. The Eskimo, for example, takes almost no cellulose at all under natural conditions, whereas the African native takes a vast quantity. It follows that there is scope for great differences in the cellulose requirements of different individuals. Thus, a fair-complexioned individual in this country, representing some northern (e.g., Viking) race, would normally require less cellulose than a dark individual representing a more southern (e.g., Latin) race. As regards item (*b*), it is clear that the more cellulose taken in the food (e.g., fruit and vegetables) the less is required to be made up by the taking of bran.

In actual practice the dosage of natural bran varies from a teaspoonful to two tablespoonfuls before each meal, but the larger dose is seldom required except in bed patients. It is essential to *start* with the larger dose and reduce it, as results occur, until the correct maintenance dose is established. Regularity of dosage is fully as important as the quantity of dosage. The reason for taking it before each meal is that proportionately less food is then eaten during the meal, and so no indigestion results; but if the appetite was fully satisfied by a meal and then a large dose of bran was taken, overloading of the stomach, with attendant discomfort, might be expected. The bran may be taken in soup or with milk, or be just washed down in a glass of water. It is unexciting to take but not unpleasant. Bran is, of course, prophylactic against constipation; it is useless for an occasional bout of this trouble. As it takes at least forty-eight hours, and sometimes ninety-six, to have any effect, it is desirable to start off a case of established constipation with an enema, and possibly another forty-eight hours later; a third is never required.

The great advantage of natural bran is the low cost (a few pence a month). People who are reasonably well off can nearly always avoid constipation by taking an *adequate* amount of fresh fruit and vegetables, but this knowledge is of little comfort to the indigent poor. For them unprepared bran is the sole natural aperient they can afford to buy. Natural bran is readily procurable. In H.M. ships the canteen can always carry a stock of it. On shore corn-chandlers stock it, and bakers can easily order it.

The question may be asked whether there is any risk of contracting actinomycosis from natural bran. The answer is definitely "No." The fungi found on wheat bear no more relation to the superficially similar *Streptothrix actinomyces* than do the bacilli of Timothy grass to the superficially similar tubercle bacillus. Natural bran is as safe to eat as any other raw vegetable or fruit.—I am, etc.,

Feb. 26. T. L. CLEAVE, Surgeon Commander, R.N.

Acute Abdominal Pain after Opium Medication

SIR,—I have been most interested in Dr. J. B. Williamson's letter (February 8, p. 215). It recalled to me some experiences which I recorded in a short memorandum in your *Journal* in 1917 (1, 72). The record is as follows.

Four cases of severe abdominal pains following large medicinal doses of opium or drugs containing its derivatives have recently come under my observation. In each instance the symptoms were such as might easily lead the observer to believe at first sight that he was confronted with an abdominal condition requiring surgical interference.

Case 1 was of a man aged 25 suffering from toothache, who took 1 grain of morphine hydrochloride by the mouth. Two hours after the administration he awoke with violent abdominal pains coming on in spasms. He was sent to hospital as possibly a case of perforated duodenal ulcer.

Case 2 was of a man aged 37 suffering from influenza. During the course of an evening he took five tablets of 5 grains each of Dover's powder, which contains 10 % of opium. The patient awoke about two hours after the last dose with violent abdominal pain.

Case 3, a man aged 23, was admitted to hospital suffering from an injury to the lower part of one thigh; he complained of great pain and was given a hypodermic injection of heroin, 1/6 grain. A quarter of an hour afterwards he began to cry out with intense pain in the upper part of the abdomen. He was apparently suffering very much, as he began to writhe about, forgetting for the time being the injury to his thigh. He continued thus for half an hour, when he was given another dose of heroin, 1/6 grain, which apparently afforded no relief and the dose was repeated; after this he became quiet and ceased to complain.

Case 4 was of a man aged 24 suffering from nasal catarrh and bronchitis, who took 2 oz. of Brompton mixture, which contains liquor morphinae hydrochlor. Between two and three hours later he was awakened by severe cramp-like pains in the region of the stomach.

These cases resemble each other very closely in their symptoms: spasms of gripping pain in the epigastric and left hypochondriac regions, coming on at intervals of a few minutes, lasting about a quarter of an hour, and so severe as to double the patient up and cause him to groan. The symptoms in the first two cases lasted for about an hour and then passed off completely without treatment other than hot bottles. The third case at the end of an hour was also free from pain, but by that time he had received in all 1/2 grain of heroin hypodermically, and it is likely that the last injection placed him so deeply under the influence of the drug as to relieve him of the consciousness of pain. Case 4 suffered for about half an hour, when he was given 1/120 grain of atropine hypodermically, after which he got almost immediate relief. In none of the cases was there any vomiting or nausea. The pupils in each instance indicated by their contraction that probably opium had been taken, and on inspecting the abdominal wall the upper part was distinctly rigid and respirations were short. In one case both recti stood out very prominently. The patients resented palpation of the abdomen, as it appeared to tend to start the spasms. On inquiring into the histories of the individual cases, none of them had

previously had any condition resembling that described, and subsequent to the attacks passing off all seemed perfectly well.

It would be interesting to know if other practitioners have had cases of this kind, as these seem to demonstrate an action of the drug which is not generally recognized. Inquiry among my medical friends reveals only one instance of acquaintance with this peculiarity of the action of opium, and in this case a well-known surgeon had a personal experience of these unpleasant symptoms. Opium causes convulsions in cats and amphibians, and a veterinary friend informs me that a severe colic is known on occasion to follow administration of morphine in horses.

In the late Sir Lauder Brunton's *Textbook of Pharmacology, Therapeutics, and Materia Medica* the fact that opium in certain conditions stimulates intestinal peristalsis is noted. He seems to have used it occasionally in very small doses, one drop or even half a drop of tincture of opium, in certain forms of constipation—for example, that caused reflexly by ovarian irritation.—I am, etc.,

London, March 12. H. P. WINSBURY-WHITE.

Operation for Acute Appendicitis

SIR,—Some years ago I saw Prof. Nordman at the Martin Luthers Krankenhaus, Berlin, use a method of operating for acute appendicitis that I have not so far seen in England. So far I have used it in some twenty-five cases. The incision is placed a fingerbreadth above and parallel to the outer half of Poupart's ligament—two to three inches long according to the amount of adipose tissue present. The external oblique is divided in the direction of its fibres and retracted, and a small intermuscular septum in the internal oblique running downwards and inwards from the anterior superior iliac spine is seen along this. As in McBurney's incision the fibres of the internal oblique and transversalis are separated by blunt dissection and the peritoneum opened.

In about one-quarter of the cases the appendix presents, in one half the colon. The anterior longitudinal band is seized with smooth forceps and gently drawn upwards until the root of the appendix is seen: this is seized with strong forceps and the appendix delivered. If the omentum presents it is thrown upwards. The fingers do not have to be introduced into the wound at all. The skin wound does not stretch. All my cases have been early ones without marked adhesions, but I seem to remember that some years ago Sir Hamilton Ballance advocated a similar incision but "muscle cutting" as the best approach for acute appendicitis.

A point about acute appendicitis that I cannot remember having seen noticed is the change in position of the appendix as the inflammation progresses: the swelling and shortening of the mesentery in the region of the ileo-colic artery drawing the caecum upwards and inwards. Dr. Crabtree of Nelson tells me that in some 6,000 routine opaque gastro-intestinal examinations he has not found the caecum elsewhere than in the iliac fossa, which seems to be the normal dwelling place.—I am, etc.,

Nelson, March 5. OWEN WILSON.

Malignant Measles?

SIR,—In reply to Dr. Audrey Baker's letter (March 8, p. 380) dealing with a so-called case of malignant measles, I am not clear on what grounds such a diagnosis was justified. The case quoted was undoubtedly an unusual one, but I would suggest that the more correct diagnosis was one of suprarenal haemorrhage. This interesting condition occasionally sets in during the first year of life as part of a rapidly fatal illness. The symptoms set in suddenly with fever and vomiting, and scattered purpuric spots quickly follow. Death usually occurs within twenty-four hours. I met such a case a few months ago, and post-mortem examination confirmed the diagnosis.

I notice Dr. Baker makes no mention of Koplik's spots, exposure to infection, or, in fact, of any of the usual symptoms associated with measles, and, in consequence, I venture to suggest that her case was one of haemorrhage into the suprarenals.—I am, etc.,

Aylesford, March 13. GEOFFREY P. GOODWIN.

SIR,—Though the case described by Dr. Audrey Baker (March 8, p. 380) was clearly both malignant and "black," it is a mistake to regard "blackness" as a sign of malignancy or malignancy as a cause of "blackness." I have met a number of cases of "black" (haemorrhagic) measles, but not one of the patients has died or shown any sign of malignancy, and some of the cases have run a decidedly mild course. A friend tells me that "black" measles was quite common in Ireland fifty years ago, and that the fatality was so high that "black" was regarded as almost synonymous with malignant, but that in those days the children were commonly poor, half-starved little creatures, and this might account for the high fatality and perhaps also for the prevalent "blackness." The patients in my own cases were all well nourished and generally in good condition, which accounts for the absence of fatality but leaves the pathology of the blackness an open question. At any rate, the terms should not be employed as though they meant the same thing.—I am, etc.,

Ambleside, March 13. J. PRICE WILLIAMS.

Continuous Pentothal Anaesthesia

SIR,—One of the questions most frequently asked by practitioners who are desirous of employing continuous pentothal anaesthesia is: "What are the difficulties that may occur?" So far as I can judge these have not been explained in detail, and having employed continuous pentothal in over 500 cases, many of which were battle casualties, I think that I have encountered most of the difficulties.

1. Fibrillation of Muscles.—In most cases only the masseter is affected, but it may extend all over the body. It is very similar to ether tremor, and disappears with the introduction of more pentothal.

2. Sudden Muscular Contraction.—This may occur spontaneously or be due to surgical stimuli. The commonest muscles to contract are the pronator quadratus and pronator radii teres, thereby adding to the difficulty of the injection. Very occasionally a rhythmical contraction may occur; one patient kept flexing and extending a knee-joint after 40 c.cm. of a 5% solution (2 grammes) had been given.

3. Very Shallow Breathing accompanied by Cyanosis.—This is very common, but is quickly remedied by a few breaths of carbogen under slight pressure. I think that continuous pentothal should not be employed by those inexperienced in its technique unless CO_2 and O_2 is available.

4. Persistent Coughing.—This has occurred in a few cases but is usually overcome by increasing the dosage. One patient was given 50 c.cm. of a 5% solution (2.5 grammes) and even then the coughing was not satisfactorily controlled. This is most unusual.

5. Severe Laryngeal Spasm.—I have had only three cases of this condition, all of which were preceded by coughing. The operation in each case was for haemorrhoids. These cases were rather alarming, but eventually responded to O_2 under considerable pressure.

6. As patients who have had large doses sleep for a considerable time afterwards, it is advisable to insert an airway before they return to the ward.

The post-anaesthetic complications are: (1) Numbness of the skin of the arm: this is transient and is due to the introduction of pentothal into the tissues. (2) Bruising of the arm. (3) Restlessness; this occurs only when under 15 c.cm. of a 5% solution has been given. (4) Thrombosis of the vein; I have had only one case of this condition.

In conclusion, these difficulties, with the exception of shallow breathing, are uncommon, and I hope will not deter those who are desirous of employing this very valuable and pleasant anaesthetic.—I am, etc.,

Feb. 14. R. HASTINGS MOORE.

Pentothal Sodium in Acute Hysteria

SIR,—I have had an opportunity of confirming Frankel's experiment mentioned in the *Journal* of January 6, 1940 (p. 14) on the use of evipan in a case of loss of memory, and agree that intravenous barbiturate is useful in dramatically relieving an acute hysterical state of mind. In this case, too,

there was "something desperate in the history which it was essential for the patient's peace of mind that he should forget."

A soldier was brought to hospital by the guard. He had suddenly become unruly and had thrown his money far and wide. There was complete "blocking" and no response to direct questioning; meanwhile the patient continued in a state of increased psychomotor activity with low moanings and rapid respirations. Careful physical examination ruled out signs of organic disease, while the fluttering eyelids were so typical of hysteria that the upward rolling of the eyeballs which occurred when an attempt was made to see the pupils merely served to confirm this diagnosis. In short, the picture was typical of the hysteric who lives from hand to mouth and who obtains a bed at hospital by defeating the young casualty officer with practised ease, and to whom the hysterical attack is an accomplishment as well as a profession. By giving 4 c.cm. of pentothal sodium solution (1 gramme in 20 c.cm. aq. dest.) sleep of an hour's duration was produced, and when seen three hours later the patient was rational and wished to rejoin his unit. It was now discovered that this man had been ordered over-seas immediately preceding the acute symptoms, hence the mental conflict. The sedative action of the barbiturate relieved these inhibitions, and the patient was now able to appreciate that malingering meant a court martial, so all idea of disobeying orders was given up forthwith.—I am, etc.,

J. A. MAXWELL CAMERON
Capt., I.M.S.

Karachi, Jan. 15.

Nurse Anaesthetists

SIR,—The correspondence on nurse anaesthetists is very interesting, but from a surgeon's point of view not very convincing.

If anaesthetists wish their calling to be considered essential, then they must be prepared to attend and administer to every routine hospital surgical operation list. This, in my experience, with few exceptions they seldom do. Often a 'phone message arrives to indicate that they cannot attend, and only occasionally do they arrange for an adequate deputy. Usually a house-physician or a house-surgeon, often newly qualified, has to give the anaesthetic, and only if an intratracheal anaesthetic is necessary must the operation be postponed. A surgeon never allows a house-surgeon to do an operation until he has been trained and tested, yet hospital anaesthetists often leave operation lists for untrained resident staff. Personally, I consider that a trained intelligent nurse is quite capable of giving an ordinary good general anaesthetic, and I have occasionally had to operate with a nurse giving the anaesthetic and with complete satisfaction. I consider that a trained anaesthetist is a luxury for a surgeon, but a newly qualified doctor is often a sore trial, and too often specialist anaesthetists leave us none other but these as deputies. In many hospitals I think that a trained nurse anaesthetist would be of great value, and the correspondence in the *Journal* to the contrary has not convinced me. I think that Cambridge is to be congratulated for raising the subject.—I am, etc.,

F. MACG. LOUGHNANE.

London, W.1, March 10.

A. C. Drogendijk (*Brux. méd.*, 1940, **20**, 617) describes the various methods employed for preventing the occurrence of post-vaccinal encephalitis—namely, vaccination within the first two months of life, while the child still retains some passive immunity transmitted from the mother, which it loses later; choice of a certain season of the year, although statistics do not prove that the risk of encephalitis is greater at one season than at another; the use of a very diluted lymph (cases, however, have occurred after a 1 in 100 dilution); and reduction in the number of insertions. Although this reduction cannot be shown to be of much effect, there is no need for multiple scarifications if one is enough. The other prophylactic methods consist in the employment of fractional vaccination, intracutaneous or subcutaneous vaccination, vaccination of the mother during pregnancy or lactation, injection of an anti-vaccinial serum, inoculation of a killed vaccine, and modification in the mode of preparation of the vaccine. None of these methods, however, has proved to be absolutely efficacious.

Obituary

T. A. ROSS, M.D., F.R.C.P.

We regret to announce the sudden death at St. John's House, Smith Square, Westminster, of Dr. Thomas Arthur Ross, who was the first director of the Cassel Hospital and held that post for fifteen years.

He was born in Edinburgh in 1875, the son of Thomas Ross, LL.D., and after schooldays at the Edinburgh Academy entered as a medical student at the university and graduated M.B., C.M. in 1897. He proceeded M.D. in 1901 after serving as resident physician and resident surgeon at the Royal Infirmary. He was then appointed physician to the Royal National Hospital for Consumption at Ventnor, where he was in general practice for sixteen years. When the Cassel Hospital for Functional Nervous Disorders opened at Swaylands, Penshurst, in 1919 Dr. Ross became its medical director and thenceforward devoted himself entirely to the neuroses and psychotherapy. He was elected a Fellow of the Royal College of Physicians of Edinburgh in 1919 and a Fellow of the Royal College of Physicians of London in 1933 after taking the Membership in 1926. He wrote three books: *The Common Neuroses and their Treatment by Psychotherapy*, which reached a second edition four years ago; *An Enquiry into Prognosis in the Neuroses*; and an *Introduction to Analytical Psychotherapy*. In the central work of the British Medical Association, which he had joined in 1898, Dr. Ross served on three special committees: the Committee for Research in Mental Diseases, the Psycho-Analysis Committee, and the Mental Health Committee. He was twice married and had two children: a son who died whilst still a medical student, and a daughter, Dr. Jean Durrant, who is an assistant medical officer at the Maudsley Hospital.

Sir ARTHUR HURST writes:

During the seventeen years he was in general practice at Ventnor Ross was greatly interested in the treatment of patients suffering from functional nervous disorders, many of whom were sent to him by Victor Horsley, who was one of the few people in those days who was not merely bored with his neurotic patients. At first Ross treated them by the Weir-Mitchell method, which was at that time almost universally used for all kinds of neuroses. The patients were kept in bed, isolated from their friends, over-fed, and massaged. For some years he met with great success. He then gradually lost his early enthusiasm for the treatment, and as he did so his results deteriorated. He soon realized that the change was not in the treatment, which remained unaltered, nor in the patients, but in himself. He had slowly come to the conclusion that exhaustion was not the sole cause of the neuroses and that his results had been largely due to his belief in the treatment. By 1914 he had learnt the lesson that the cures were the result of faith and hope, and that the ideal psychotherapy is to teach the patients how they can reacquire faith in themselves. He acknowledged that there were cases where psycho-analysis was required, but there was a large majority in which better results could be obtained by simple methods. This conclusion did not in any way diminish his appreciation of Freud's contributions to our knowledge of the neuroses, although it was to the encouragement and advice he received from Henry Head and the writings of Dejerine that he felt chiefly indebted for his success as a psychotherapist. "The Freudians long ago gave up the general physician as a hopeless person who is unteachable, and it seems desirable," he wrote, "that those of us who are in the first instance physicians and only in the second psychotherapists should not give up the Freudians." It was for this reason that he published in 1932 his *Introduction to Analytical*

Psychology, in which he emphasized what seemed to him to be good in analysis without dwelling too much on the bad.

From 1917 to 1919 Ross was attached to the Springfield war neurosis hospital. In 1919 Sir Ernest Cassel decided to give a large sum of money for the advancement of some pioneer work in medicine. He asked for three schemes from which to choose. He adopted Sir Maurice Craig's suggestion of an institute for the treatment of neuroses in patients of moderate means, and the Cassel Hospital at Swaylands, Penshurst, thus came into being. Craig had no doubts from what he knew of Ross that he was the ideal man to be the first medical director of the new hospital; and the future was to show how wisely he had chosen. After a preliminary visit to a number of American clinics Ross began work at this, the first hospital of the kind to be established in Great Britain. His success during the fifteen years he was medical director was remarkable, as innumerable grateful patients and their doctors can testify. His annual summary of the year's work and follow-up of all of his 1,200 old patients was later summarized in 1936 in his *Enquiry into Prognosis in the Neuroses*. This was a most valuable contribution to the literature of psychotherapy and the first and most complete work of the kind to be published. He found that 45% of his patients were well and 25% improved after one year, 40% after three years, and 34% after five years—an unexpectedly good result.

Ross believed that the great bulk of functional nervous disorders can be treated successfully by the general practitioner, and it was in this belief that he wrote his great work on *Common Neuroses*, a worthy sequel to Dejerine's *Névroses et Psychonévroses*. Since its publication in 1923 I have always told students that whatever textbook on medicine they like to read they must supplement it by reading Ross's *Common Neuroses* if they aspire to be successful practitioners. As Ross pointed out, if the general practitioner is to undertake psychotherapy his treatment must be simple and reasonably short, and he will find that it is rarely necessary to refer a patient to an expert psychotherapist for more prolonged and specialized treatment. Ross was convinced that general practice or general medicine was the proper approach to specialized psychotherapy, and he deplored the tendency of the teaching hospitals to choose alienists as their instructors in the subject. He equally deplored the modern tendency for a newly qualified medical student with no postgraduate medical training and no knowledge of the world to set himself up as a specialist in psychotherapy with no broader training and no sounder foundation than a course of instruction at a psychotherapeutic institute.

Ross was a charming companion and it required a very short time in his presence to make one understand how quickly he was able to gain the confidence of his patients and to help them to regain their mental health. All who knew him will agree with Sir Farquhar Buzzard that "his success, both as a doctor and a friend, was due to his personality. Behind the screen of a charming gentleness and modesty of demeanour there lay solid moral courage and transparent honesty of purpose, qualities which even he could not disguise by an inimitable and pawky sense of humour."

On February 19 the death occurred at Ashburton, South Devon, of Dr. THOMAS OATES HALLIWELL at the age of 70. He had been a member of the British Medical Association for thirty-four years. Trained at St. Thomas's Hospital, Dr. Halliwell qualified M.R.C.S., L.R.C.P. in 1894. He practised in his native town of Dewsbury, Yorks, for some years. In 1906 he gained the D.P.H. at Leeds and became medical officer of health and school medical officer for Dewsbury, where he built up the public health service. A serious illness caused him to resign this appointment, but happily he recovered and entered the local government service as resident medical officer at the Stanchiffe Poor Law Institution, which later became the Stanchiffe County Hospital under the West Riding County Council. It was at this post (writes V. R.), which he held till his retirement some six years ago, that Dr. Halliwell's all-round abilities were displayed. As well as being an administrator he was surgeon, physician, and gynaecologist, a type of doctor which has become all too rare. He took great interest in training nurses for the C.M.B., for which he acted as examiner latterly. A man of courtesy and charm combined with a Yorkshire straightforwardness, Halliwell will be missed by his many friends. Those who had the privilege of knowing him in his family circle will remember the culture and hospitality of his home. He was a collector of old china and antique furniture. He took a keen interest in freemasonry. He leaves a widow and daughter. His son, Eric Oates Halliwell, M.R.C.P., practises in Yorkshire.

DR. JOHN ADOLPHUS KENNEDY of Portstewart, Co. Derry, died at Hopefield Cottage Hospital, Portrush, Co. Antrim, on January 4, aged 68. He graduated B.A., M.B., B.Ch. at Trinity College, Dublin, in 1899, and soon after was appointed dispensary medical officer for Portstewart, a post which he held until his death. He proceeded to the M.D. degree in 1904. A member of the North-East Ulster Division of the British Medical Association, Dr. Kennedy was very popular with his medical colleagues, and was held in high esteem by the residents of the town. He was Senior Elder of Portstewart Presbyterian Church and was a member of the Masonic Order.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

On the recommendation of the Faculty Board of Medicine the Senate resolved on March 14 that Grace 6 of October 20, 1939, shall not apply to medical students whose first term of residence is the Michaelmas term of 1942 or a later term. The Grace in question puts into abeyance, until further order, Regulation 8 (*c*) for the M.B., B.Chir. degrees, which requires a candidate for the Final M.B. examination to have obtained honours, or to have attained the honours standard, in the Natural Sciences Tripos.

The following are the dates of Congregations to the end of the Easter term: Saturday, April 26, Friday, May 9, Saturday, May 24, and Friday, June 6, at 2 p.m. There will also be general admissions on Saturday, June 14, at 11 a.m., and on Tuesday, June 17, at 11 a.m. and 2 p.m.

At a Congregation held on March 14 the following medical and surgical degrees were conferred:

M.D.—*C. E. D. H. Goodhart, C. G. Batty-Smith, G. S. W. Organe.

M.CHIR.—*R. C. F. Catterall, *G. Blackburn, *J. S. Ellis.

M.B., B.CHIR.—J. G. Craddock.

* By proxy.

UNIVERSITY OF LONDON

Retirement of Principal

The period for which Mr. H. L. Eason, M.D., M.S., F.R.C.S., was appointed as Principal of the University ends on September 30, and the Senate has decided that the post shall not for the present be filled. Mr. Eason has held the office of Principal since July, 1937, having been a member of the Senate from 1911 and Vice-Chancellor from 1935. He is the President of the General Medical Council, on which body he has represented the University since 1925. The Senate, with the concurrence of the Court, has appointed Mr. Harold Claughton as Acting Principal from October 1.

Postponement of Elections by Convocation

Under an Emergency Statute no elections by Convocation of persons to be members of the Senate will be held in 1941, and those persons who are due to retire on the second Tuesday in May of this year will continue to be members of the Senate until the second Tuesday in May, 1942. Under another Emergency Statute no elections to the offices of Chairman and Deputy Chairman of Convocation are to be conducted before March 1, 1942, and the present holders of these offices will continue in office until May 10, 1942.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the Royal College of Surgeons of England, held on March 13, with Sir Hugh Lett, Bt., President, in the chair, Prof. A. W. Sheen, Mr. W. H. Brown, Prof. John Morley, and Prof. P. J. Moir were elected Members of the Court of Examiners.

The title of Professor of Human and Comparative Anatomy was conferred upon Dr. A. J. E. Cave.

Mr. Eardley Holland was re-elected as the representative of the College on the Central Midwives Board.

Diplomas

Diplomas of Fellowship were granted to the following candidates:

J. E. Richardson, H. Freeman, T. I. Hughes, J. P. Reidy, Katharine M. H. Branson, Janet E. Bottomley, W. W. Wiggins-Davies, Dorothy M. S. Knott, H. L. Brewer, W. N. Campbell, L. Henry, C. W. Maclay, H. Rees, V. N. Singh, A. A. Wearn.

A Diploma of Membership was granted to Mohamed Abdul Hafeez of Osmania University and West London Hospital

Diplomas in Tropical Medicine and Hygiene were granted, jointly with the Royal College of Physicians of London, to the following candidates:

F. I. C. Apted, M. A. Cave, M. A. X. Cochemé, J. J. Dubash, C. L. Ferguson, Brenda Fife, G. D. Harthan, Sara Joelson-Syrop, W. N. Kenrick, H. L. Maclure, D. H. Manson-Bahr, P. J. Pablot, A. E. Seligmann, D. B. Sen, S. B. Sinha, L. H. Turner, W. J. Tyson, A. J. Walker, C. Wilcocks.

Diplomas in Ophthalmic Medicine and Surgery were granted, jointly with the Royal College of Physicians of London, to the following candidates:

H. S. Grewal, F. J. Lorriman, A. Philipp.

The Services

AWARDS AND MENTIONS IN DISPATCHES

Captain Geoffrey Ollivant Brooks, R.A.M.C., has been awarded the George Medal for conspicuous gallantry in carrying out hazardous work in a very brave manner.

Lieut. William Sillar, R.A.M.C., has been awarded the Military Cross in recognition of distinguished services in the field.

Surgeon Commander Francis Laird Cassidi, V.D., R.N.V.R., has been awarded the *Volunteer Officers' Decoration.*

Surgeon Lieut.-Commander Gavin H. Cameron, R.A.N.R., has been awarded the *Royal Naval Volunteer Reserve Officers'* Decoration.

Temporary Surgeon Lieuts. Hamish Alexander Wallace, R.N.V.R. (posthumous), and Daniel Jack Wilkes, R.N.V.R., have been mentioned in dispatches for courage and devotion to duty.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Missing

Surgeon Lieut. Lyon Ramsay Blair, R.N.

ARMY AWARDS

Corrigenda

In the list of officers whose names have been brought to notice in recognition of distinguished services in connexion with operations in the field, March to June, 1940, published in the *Journal* of January 4, two names were misspelt and the initials of five others were wrongly given. Major J. Houston, R.A.M.C., and Lieut. N. C. Rodgers, R.A.M.C., should read Major J. *Huston, R.A.M.C., and Lieut. N. C. Rogers, R.A.M.C.*, and the initials of Captain (Acting Major) A. G. Whitfield, R.A.M.C., Captain L. Evans, R.A.M.C., and Lieuts. W. G. J. Gordon, C. Hope, and J. H. Rose, R.A.M.C., should read Captain (Acting Major) A. G. W. Whitfield, R.A.M.C., *Captain L. F.* Evans, R.A.M.C., and Lieuts. D. G. J. Gordon, G. H. G. Hope, and J. D. Rose, R.A.M.C.

The Colyer Prize was founded in 1926 to commemorate the twenty-five years' service of Sir Frank Colyer as honorary curator of the Odontological Museum. The accumulated income of this fund may be used every third year for a prize for the best original work in dental science, completed during the previous five years, by a dental surgeon educated at any recognized dental school in Great Britain or Northern Ireland, who has not been qualified to practise more than five years at the date of the award. Applications from candidates for the fourth award should be submitted by September 30, together with a general account of their researches, both completed and in progress, to the secretary, Royal Society of Medicine, 1, Wimpole Street, W.1, and marked "Colyer Prize."

Medical Notes in Parliament

The Parliamentary Medical Committee met at the House of Commons on February 8, when Dr. John McMichael of the Postgraduate Medical School, Hammersmith, and Dr. G. O. Barber, medical officer to Felsted School, opened a discussion on post-war medical planning. Debates followed on the future of medical practice. Sir Francis Fremantle was in the chair.

Overruled Decisions of Medical Boards

Dr. MORGAN asked on March 11 what were the general principles applied by the Army Medical Department when it overruled the opinion of civilian doctors in connexion with the examination of recruits for the Army and Auxiliary Territorial Service; when the overruling took place, at medical boards or subsequently; in how many cases the civilian medical opinion had been overruled; and had the civilian doctors been consulted before their opinion had been overruled. Captain MARGESSON said in reply that the opinion of civilian doctors regarding the physical fitness of recruits for the Army and the Auxiliary Territorial Service was overruled only after careful consideration of each individual case by the Army medical authorities, and, if necessary, after obtaining specialist advice. Apart from the examination of a recruit on joining, a disability might come to light during training: on the other hand, the conditions of Army life might improve the physical fitness of a recruit to such an extent as to justify transfer to a higher medical category. Information regarding the number of occasions on which the opinion of the Army medical authorities differed from that of the civilian medical board was not readily available. It was not considered practicable for administrative reasons to consult the civilian doctors on these occasions.

Adjustment in Industry

Dr. MORGAN declared on March 11 that a number of persons employed in war factories had been obliged to cease work owing to muscular strains and neuritis due to constant application to unaccustomed work and that they could not obtain any compensation or special remedial treatment for such injuries. He also said that in many industrial centres adequate and appropriate treatment facilities were non-existent. He asked what Mr. Ernest Bevin was doing to remedy this. Mr. BEVIN answered that in the majority of cases workers adjusted themselves to unaccustomed work after a short period and were not obliged to cease employment during the period of adjustment. He invited Dr. Morgan to give particulars of any contrary cases and promised to consider them.

Hospital Equipment under War Damage Bill

While the House of Lords was in Committee on the War Damage Bill on March 13 Lord LUKE said it was unlikely that hospitals would be as generously treated for equipment as for buildings. They would have to pay a premium for the insurance of the former, and he hoped that would be one which they could afford. They would like to insure a portion of the equipment if the hospital could not afford a premium on the whole. It was possible to carry on without x-ray equipment, but not without an operating theatre. He moved an amendment providing that in the insurance of goods held for charitable purposes the Board of Trade should consult a national, regional, or other body representing the purposes for which the goods were held.

Viscount SIMON, the Lord Chancellor, said the equipment of hospitals and other charitable bodies would be insurable under the business scheme and not under the private chattels scheme, and there would be no limit to the amount that could be covered. The definition of business was wide enough to cover the beneficent work of hospitals. The Board of Trade had consulted the Ministry of Health about hospitals, and the British Hospitals Association was in close touch with that Ministry. Any representations which still had to be made about hospitals would receive sympathetic attention. He gave an assurance that the Board of Trade would consult the Ministry of Health, if necessary, on any questions affecting hospitals which might arise in the administration of Part II of the Bill

and the Ministry would consult the British Hospitals Association. The Board of Trade had power to pay compensation although there had been no insurance. That power would be used to pay compensation for damage occurring before passage of the Bill. It was not intended to compensate hospitals for equipment not insured after the insurance scheme came into operation. Those for whom Lord Luke spoke should communicate with the Ministry of Health to find out which was the best way to proceed.

Lord LUKE withdrew his amendment and the Committee stage concluded.

Army Vaccination Instructions

Mr. VIANT asked on March 18 what instructions had been issued to Army medical officers in regard to the carrying out of vaccinations. Captain MARGESSON replied that the more important points in the instructions issued with regard to vaccination might be summarized as follow: (1) The individual must be in good health. (2) The skin over and around the site for vaccination should be cleansed. (3) The cleansed area must be allowed to dry thoroughly. (4) The vaccine lymph should be applied to this area before scarification is carried out. (5) Scarification should be made with a sharp-pointed scalpel, and should consist of a single linear incision one-quarter inch in length passing through the lymph. The incision should not be deep enough to draw blood. (6) Further scarification or energetic rubbing of the lymph into the incision should be avoided, as this tends to aggravate local reactions. (7) The dressing recommended is elastoplast, which should be applied after the lymph has been allowed to dry completely. Captain Margesson added that vaccination was carried out by scarification. One mark was produced. Revaccination was carried out at intervals of two, five, or seven years following successful vaccination according to local conditions.

Diphtheria in Immunized Edinburgh Children

At the request of Mr. JOHNSTON, the medical officer of health for Edinburgh has extracted from his records the following figures for the years 1938, 1939, and 1940. These figures are approximate, but complete statistics are now being kept for Edinburgh.

	1938	1939	1940
Approx. number of children immunized up to the end of the year	31,000	33,000	34,000
Number of immunized children who contracted diphtheria during the year ..	31	23	9
Number of fatal cases among these children in the year	1	—	—

Doctors' Identification Cards

Dr. MORGAN asked if the Minister of Health was aware of the ease with which doctors might obtain admission on demand to places of military importance without being required to produce evidence that they were in fact doctors. He asked whether the Minister would take steps to see that all doctors were provided, without delay, with identification cards containing their portraits and some authoritative indication that the portraits were those of medical practitioners, in view of the fact that the scheme already proposed for that purpose failed to operate except in comparatively few instances. Mr. ERNEST BROWN replied on March 12 that the majority of medical practitioners had already taken advantage of the special arrangements announced last October for the issue of authorized certificates of occupation. Those who had not done so were still at liberty to take advantage of these facilities. The Secretary for War and he were not satisfied that any need existed for further documents of identification for members of the medical profession. He was therefore not prepared to take the steps suggested by Dr. Morgan.

Staffing of E.M.S. Hospitals.—Dr. MORGAN inquired on March 6 whether, in view of the prevalence of influenza and other non-surgical complaints, Mr. Brown would see that physicians were appointed to those Emergency Medical Service Hospitals where such cases were at present under the care of surgeons. Mr. BROWN answered that the services of a specialist physician were available at every hospital in the emergency hospital scheme, although not necessarily on a resident basis.

Milk Supplies.—Mr. LIPSON asked on March 13 what steps were taken to ensure that an adequate supply of milk would be maintained. Mr. R. S. HUDSON answered that dairy cows received priority in the allocation of feeding stuffs under the rationing scheme. Every encouragement was given to dairy farmers in the ploughing-up campaign to become more self-supporting and to safeguard supplies of feed next winter by making silage and growing suitable fodder crops for their herds. In addition the Government recently announced prices for milk during the ensuing twelve months designed to maintain production at the highest level compatible with war conditions.

Medical Publishing and Reserved Occupations.—On March 18 Sir E. GRAHAM-LITTLE asked if the Minister of Labour would give consideration, in revising the Schedule of Reserved Occupations, to the necessity for retaining a sufficient number of employees of firms publishing medical and nursing books, a category in which fresh publications were demanded by the continuous advances in medicine and nursing. Mr. TOMLINSON said that it would not be practicable to place such publishing firms in a special category. If in any case it was regarded as important to retain the services of a particular individual, application for deferment could be made in the usual manner.

Medical News

A Chadwick Public Lecture on "Air Raid Shelters—Design and Construction, with Special Reference to Hygienic Considerations," will be delivered at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C., on Tuesday, April 8, at 2.30 p.m., when Dr. S. L. Wright will discuss hygienic considerations and Mr. Phillip O. Reece design and construction.

The sixty-first annual meeting of the Mental After-Care Association will be held in the rooms of the Royal Society at Burlington House, Piccadilly, W.1, on Tuesday, March 25, at 2.45 o'clock, under the presidency of Princess Arthur of Connaught. Among the speakers will be Colonel Henry Yellowlees, M.D., chairman of council. Anyone interested in the work of the association will be welcome.

The annual general meeting of the Central Council for the Care of Cripples will be held at Carnegie House, 117, Piccadilly, London, W., on Friday, March 28, at 2.30 p.m. An address will be given by the Right Hon. Ernest Brown, M.P., Minister of Health.

The next meeting of the Shaftesbury Military Hospital Medical Society will be held at the hospital on Tuesday, March 25, at 2.30 p.m., when there will be a discussion on "The Management of Battle Casualties in the Light of Modern Operational Tactics," to be opened by Colonel C. L. Franklin, A.M.S.

The Ling Physical Education Association (Hamilton House, Bidborough Street, W.C.1) is holding an Easter holiday course at the Bedford Physical Training College from April 15 to 18, when there will be many lectures and discussions on a variety of subjects as well as practical classes in the different branches of physical education. Medical, legal, and social welfare matters are among the subjects on which lectures will be given. Dr. Janet Aitken, senior physician, Elizabeth Garrett Anderson Hospital, is to speak on "Rheumatism in School Children," and Miss P. C. Colson on "The National Organization of Physical Recreation." There will be group discussions on "Problems of Rural Reception Areas," "Medical Inspection and the Gymnast," and other matters interesting to those concerned with education. Within a few days of the publication of the programme all the available places were filled.

The B.B.C. announces that "Health Magazine," a series of topical notes on wartime health—contributed mainly by doctors—will be continued on Fridays during April at 10.45 a.m. Two broadcasts in the daytime programmes for schools deal with medical history. The first, on April 1 at 1.50 p.m., in the series "Our Changing Countryside," tells the story of the village nurse from "Mrs. Gamp" to a public health service. It also describes the aeroplane ambulance in the Highlands. The second talk, on April 24 at 2.40 p.m., in the series "Movements and Men," describes how Elizabeth Garrett Anderson struggled to become a doctor and how she helped to open a path for other women.

No. 8

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended February 22, 1941.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 120 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941					1940 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	434	21	70	1	12	586	27	134	3	1
Deaths		4	7				10	9		
Diphtheria	1,042	54	352	26	26	734	30	192	64	23
Deaths	31	1	6	2	1	31	2	5	2	—
Dysentery	202	36	31		—	63	2	28	1	—
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	5	—	2	—	—	6	1	—	—	—
Deaths		—	—				—	2		
Enteric (typhoid and paratyphoid) fever	25	4	5	—	1	6	1	—	—	1
Deaths	—	—	—	—	—	—	—	—	—	—
Erysipelas			57	7	1			63	5	5
Deaths		—	—				—			
Infective enteritis or diarrhoea under 2 years	31	4	8	9	2	31	4	7	4	7
Deaths										
Measles	14,976	269	176		19	4,793	93	126		316
Deaths	14	1	2	—	—	8	—	—	—	16
Ophthalmia neonatorum	76	2	16	1	—	82	5	20	—	—
Deaths										
Pneumonia, influenzal	1,874	89	53	11	12	2,280	110	109	10	14
Deaths (from influenza)	314	26	13	3	8	629	59	84	20	28
Pneumonia, primary			446	10				443	17	
Deaths		107		18	20		124		43	31
Polio-encephalitis, acute	2	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	29	—	1		—	8	1	1		—
Deaths		—	—				—	—		
Puerperal fever	1	1	19	—	—	2	2	3	2	—
Deaths		—					—			
Puerperal pyrexia	150	7	32		—	152	10	22		4
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,238	53	172	28	30	1,174	38	132	50	67
Deaths	1	—	—	—		4	—	—	—	1
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	2	—	—	—	—	—	—
Deaths			—	—				—	—	—
Whooping-cough	3,253	59	597		19	521	13	15		7
Deaths	34	—	13	1	1	6	—	1	1	—
Deaths (0–1 year)	411	30	37	39	25	389	29	118	43	28
Infant mortality rate (per 1,000 five births)										
Deaths (excluding stillbirths)	6,891	1,019	837	250	196	9,494	1,427	1,085	364	324
Annual death rate (per 1,000 persons living)			18.2	16.6	17.2			20.7	24.3	28.4
Live births	4,818	345	839	309	222	6,595	1,027	912	345	244
Annual rate per 1,000 persons living			17.0	20.5	19.4			18.5	23.0	21.4
Stillbirths	210	15	37			305	37	49		
Rate per 1,000 total births (including stillborn)			42					51		

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

For the week ending February 22, scarlet fever, whooping-cough, cerebrospinal fever, and dysentery all increased in incidence in England and Wales: generally speaking, these diseases were also more prevalent in London, with the exception of scarlet fever and cerebrospinal fever, and in Scotland with the exception of cerebrospinal fever. Since the week ending February 22 notifications have begun to diminish in number: February 22, 434; March 1, 400; March 8, 370; it is hoped that this downward trend will continue. At present fifty out of the total sixty-one administrative areas in the whole country are involved, notably Lancaster 61; Yorks, West Riding, 37; Glamorgan 36; London 21; Warwick 20; Middlesex 19; Essex 17; Chester 15; Gloucester 14; Durham, Southampton, and Stafford 13 each; Kent 12; Derby and Surrey 10 each. In Scotland twenty-three counties or boroughs are affected, chiefly the counties of Lanark 4, and Berwick 3; and the boroughs of Glasgow 21, Edinburgh 6, and Aberdeen and Paisley 3 each.

Dysentery

Dysentery is present in nineteen administrative areas, but over four-fifths of the cases occurred in six areas—namely, Yorks, West Riding, 51 (Bradford 20, Sheffield 12, Wakefield 11, Wortley R.D. 19, Aireborough U.D. 1); Essex 39 (Colchester 34, Brentwood U.D. 5); London 36 (Wandsworth 24, St. Marylebone 4, Chelsea and Finsbury St. Pancras 2 each, Hampstead and Stepney 1 each); Lancaster 25 (Manchester 5, St. Helens 1, Lancaster M.B. 6, Preston R.D. 4, Whiston R.D. 3, Warrington R.D. 2, Prestwich M.B. 1); Dorset 16, in Weymouth and Melcombe Regis M.B.

Influenza

In the week ended March 8, 199 deaths were ascribed to influenza in the 126 great towns—68 fewer than in the previous week. Of these deaths, 6.5% were at ages under 25 and 55.8% at ages over 65. In the County of London the deaths decreased from 20 to 13; the proportion of total deaths coming from the South-Eastern Area was 35.6%. This is the third week of decline in total mortality, and it is highly probable that the winter epidemic has spent its force.

Typhus Fever

Two cases of typhus fever were notified during the week in Clifton R.D., Co. Galway, and reports have since been received that between February 17 and 26, 23 cases of this disease have been admitted to hospital in this locality. Precautions taken to prevent spread appear to have been successful and there have been no deaths.

Registrar-General's Return for Northern Ireland for the Quarter Ended December 31, 1940

During the quarter 5,490 births (2,851 males, 2,639 females) were registered, equivalent to an annual rate of 16.9 per 1,000 of the estimated population, or 1.5 below the average for the corresponding quarters for the preceding five years. Illegitimate births were 4.4% of the total. There were 3,691 deaths (2,077 males, 1,914 females), corresponding to an annual rate of 12.3, or 1.4 below the average rate for 1935-9. Infant mortality was 73 per 1,000 births, compared with 67 for 1940 and an average of 76 for the five preceding years.

Leon J. Aries (*Surgery*, 1941, **9**, 51), as a result of experimental studies with synthetic fibre (nylon) as a buried suture, concludes that nylon has all the good qualities of silk and in addition is stronger and less irritating. It may be boiled several times without losing its original tensile strength. He found that a multifilament nylon was flexible, easily handled, and threaded without difficulty on fine needles. This suture approximated tissues without cutting through, and in fascia and muscle did not cause as much irritation as silk. Experiment on hollow viscera showed the same properties, and the use of nylon in attaching such viscera to the abdominal wall did not result in fistulous tracts.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

How are Road Accident Injuries Caused?

Lieut.-Colonel J. A. A. PICKARD, D.S.O. (general secretary, the Royal Society for the Prevention of Accidents, 52, Grosvenor Gardens, S.W.1), writes: Are road accident injuries mainly due to impact with the vehicle or with the road or by crushing? In factories, injuries due to being struck by reciprocating machinery such as cranks have been lessened by facing such moving parts with sorbo rubber. It has been suggested to us that if the bumpers and wings of motor vehicles were similarly treated the severity of injuries from road accidents would be reduced considerably. I should greatly appreciate the medical view on this point.

Calcium Lactate

Dr. J. A. BROWN (Birmingham) writes: Mr. A. J. Hobson's prescription (February 1, p. 182) becomes "thick and valueless" because it contains excess of $CaCO_3$, resulting in a mixture of calcium lactate and calcium carbonate. The following prescription contains calcium lactate grains xv in each dose, and will remain clear and active for ten to fourteen days:

℞	Calcii carb.	3iij
	Ac. lactic. pur.	3j
	Aq.	ad 3viij

F.M. Sig.: 3ss t.d.s., p.c.

Mix the $CaCO_3$ with two ounces of water in a wide measure; shake well; add lactic acid slowly. The mixture is of great value in the prevention and treatment of chilblains and in the treatment of urticaria. Preventive treatment of chilblains should be commenced in October, 3ss t.d.s. for a week, 3ss bis die subsequently. I have not tried the effect of this treatment for dysmenorrhoea.

Jam from Rose Hips

Dr. MARGARET D. WRIGHT (Hammersmith) writes in reply to Dr. W. J. Burns Selkirk (March 15, p. 426): To every pound of hips allow 1/2 pint of water. Boil till the fruit is tender and pass the pulp through a fine sieve to keep back the seeds. Add 1 lb. of sugar to 1 lb. of pulp and boil till it jellies. No hips should be used for jam until they have been touched by frost. Either an enamel-lined or glass oven-ware saucepan *must* be used.

Treatment of Night Sweats

Dr. MICHAEL G. GOOD writes in reply to "J. N. T." (March 8, p. 389): In a patient suffering from heavy night sweats and slightly raised temperature a tuberculous lesion can be excluded only after an x-ray investigation of the chest and an examination of the sputum, if present, are negative. For the relief of night sweats I recommend barbitone 5 grains taken at bedtime or, alternatively, phenobarbitone 1/2 grain t.d.s.

A Case of Cow-pox

Dr. J. HOWART NIXON (Chippenham) writes: The description given by Dr. McCloy, March 8 (p. 362), suggests to me that though cow-pox is common in man (as Jenner knew), his case may be one of foot-and-mouth disease in the human being. This will be confirmed by an outbreak of foot-and-mouth disease in the cloven hoof animals in the district and disseminated irregularly on various farms. The veterinary profession is not unanimous on the incidence of foot-and-mouth disease in man, though it has been proved by cases quoted by Prof. J. A. Nixon and myself, investigated in Wilts and Somerset, and later confirmed by outbreaks of the disease in the district, to be of more frequent occurrence than suspected, as the older generation of farmers knew and cured. The death rate in cattle is about 2%, but the infectivity is so high that the slaughter policy of the Government is justified. But why not produce a race of cattle immune to foot-and-mouth disease, as can be scientifically done?

Income Tax

Salary and Allowances

"A. B." is working under the E.M.S. scheme and receives a salary of £550 and allowances of £100. Is he liable on the £100?

*** Yes, if it is received in cash, as apparently it is.

Cars Destroyed by Bombs

"H." possessed two cars, A and M, for which running costs and depreciation were allowed. Both were destroyed by one bomb. Another M car was then hired with option to purchase, but this also was hit by a bomb almost at once. The owner accepted as compensation the wrecks of the two M cars. The A car was sold for £5. Since then another A car has been bought for £30. How should these disasters be reflected in the income tax return?

*** The return for 1940–1 will not be affected; the allowances to be claimed in making the return for a subsequent year are as follows. (In so far as the claim ranks as an expense it will affect the profit of the professional year—that is, to December 31—in which the loss occurred.)

(*a*) Obsolescence allowance as an expense incurred when the car was replaced (i) for the first A car—value of the car as written down after deduction of the 1940–1 depreciation allowance less the £5 for which it was sold. The maximum allowance is the £30 expended; (ii) for the first M car the whole of the written-down value should be recorded for future reference: no claim can be made until the car is replaced. (*b*) Depreciation allowance on the second M on its estimated capital value and the second A car on its cost—that is, £30—for the period during which they were used.

LETTERS, NOTES, ETC.

Paratyphoid in Infancy

Dr. F. O. CLARKE (Blackpool) writes: In your issue of March 8 (p. 385) there is a notice of a case of paratyphoid A in a male infant aged 1 year. About eight years ago I had as a patient a female infant under 1 year suffering from paratyphoid B. The infant was artificially fed. In the same house there were two young girls suffering from paratyphoid B, confirmed by agglutination test. In the case of the infant I did not have an agglutination test done, as the symptoms and signs were diagnostic, including a few rose spots. It would be interesting to know if the case of paratyphoid B is also "remarkable owing to the rarity of the disease at that age."

Hay-fever Desensitization

Dr. SINCLAIR MILLER (Harrogate) writes: For several years past I have had an opportunity of observing the benefit derived from an intensive course of a polyvalent grass-pollen vaccine in the prevention of hay-fever attacks. The course of inoculations is usually started in March, the initial dose of the vaccine being dependent on the reaction to a skin sensitization test. The patient is taught to give his own injections, following a technique similar to that used for insulin, and various dilutions of the vaccine are supplied in rubber-capped bottles so that the patient can readily increase each succeeding dose—a 15% increase on the previous dose is the standard accepted. The injections are generally given daily, though occasionally twice daily if the commencement of the course has been delayed. In most cases an end dose of 100,000 units is reached before the last week of May, when injections are stopped. In practically all cases coming under a full course of inoculations there has been complete desensitization to pollen and freedom from hay-fever symptoms for the current year. By the following springtime sensitization has returned, though generally to a less degree, and a further course of inoculations is required.

Cleansing the Shelters

One of the problems connected with public air-raid shelters is that of adequate cleansing. It appears that local authorities have to spend large sums of money, and to use numbers of men who can ill be spared, for this admittedly important work. Experiments have therefore been carried out by the Health and Cleanliness Council (Aldwych House, W.C.2) with an electric floor-cleaning apparatus, capable of washing thoroughly and drying 3,000 superficial feet an hour. The experiments were so successful that it is proposed to put a mobile cleansing unit on the road at an early date. This unit will comprise an electric floor scrubber working from light or power laid on in the shelter or from a generator on the van. It is hoped to include in the service unit electrical sprays for the suppression of vermin, etc.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY MARCH 22 1941

ECONOMY OF DRUGS IN WARTIME

MEMORANDUM BY THERAPEUTIC REQUIREMENTS COMMITTEE

Following the statement on shortage of drugs by the Ministry of Health and the Department of Health for Scotland reproduced in the *British Medical Journal* of March 8 (p. 372), the Therapeutic Requirements Committee of the Medical Research Council has issued a memorandum on Economy in the Use of Drugs in Wartime.[1] The membership of the committee is as follows: Prof. L. J. Witts, M.D. (chairman), Prof. A. J. Clark, M.D., Mr. C. E. Corfield, B.Sc., Mr. H. Davis, Ph.D., Prof. J. A. Gunn, M.D., Dr. Philip Hamill, Mr. R. Dawson Hutchinson, M.P.S., Dr. W. P. Kennedy, Mr. A. Mortimer, M.P.S., and Prof. G. H. Wooldridge, F.R.C.V.S., with Dr. C. H. Hampshire as secretary. After recalling the appointment of the committee in September, 1939, the memorandum proceeds:

The following classification of drugs, according to their therapeutic value and availability for use in wartime, has been prepared by the committee. It is based on a provisional list which was circulated in September, 1940, to departments, bodies, and institutions concerned with the supply or use of drugs, and which was also extensively quoted in various journals. Certain supplementary lists of a more specialized character were subsequently issued in a similar limited way. The present list has been revised and extended in accordance with suggestions received as a result of this preliminary action.

If a list of drugs were to be restricted to those that are essential for the saving of life it would indeed be small; but the committee does not feel that there is at present any necessity for so drastic a reduction. The position when the committee first met was that most drugs which came from abroad were being imported into this country under open general licences, and something like a vicious circle had developed. Because there was no shortage drugs which were not essential continued to be used, and, as they were used, further supplies were imported. Moreover, important drugs were used for purposes for which they were not essential. It now appears probable that, in order to conserve our foreign exchange resources and relieve the strain imposed on our shipping and port facilities, such imports will have to be restricted to the minimum which is really necessary in respect of the population at home and for the export trade. It is in these circumstances that the committee has prepared this revised classification of drugs for the assistance of Government Departments and of the various bodies concerned with the preparation of formularies or with the manufacture and distribution of drugs, both for human and veterinary use, and for the information and guidance of medical and veterinary practitioners.

The list is based on the *British Pharmacopoeia, 1932*, including Addenda 1936 and 1940, and on the *British Pharmaceutical Codex*, 1934. Preparations composed of drugs mentioned in the list are not usually included, nor are all the alkaloids or active principles which may be derived from crude drugs imported into this country separately listed. As there is no *British veterinary pharmacopoeia*, and therefore no official list of sera and vaccines for veterinary use, the committee has not included veterinary sera and vaccines, but prescribers are assured that substances of this class which are of proved efficacy will be freely available. Proprietary names of drugs are not used except where it has seemed unavoidable, and although this has meant the omission of certain valuable proprietary preparations which are manufactured in this country, it is hoped that no essential drug has been left out of the list. In wartime it is more than ever desirable to order drugs by non-proprietary names, otherwise a false impression of scarcity may be created by the disappearance of a particular brand from the market. Multiple names are very common amongst the arsenicals, barbiturates, local anaesthetics, and mercurials, and variations may be performed on a familiar chemical theme to produce branded articles differing only slightly from one another. Prescribers who do not recognize a particular drug under the nomenclature used in this list are therefore advised to consult the schedule of Pharmaceutical Specialities, British Equivalents and Alternatives for Foreign Proprietary Products, 2nd Edition, 1940, published by the Association of British Chemical Manufacturers. They will probably discover from the schedule that the drug has a non-proprietary synonym, and that this is the name used in the present list, or else that an equivalent is manufactured in Great Britain.

Economy in the use of a drug may be necessary in wartime because the drug is imported or because its manufacture at home diverts materials and skill from other essential services. It is well known that the majority of the vegetable drugs in the *British Pharmacopoeia* comes from over-seas, but it is not so generally realized that an important proportion of the newer synthetic drugs, or of the raw materials from which they are made, is also imported. It would not be politic at the present time to indicate which drugs are in whole or in major part derived from imported sources. It must be emphasized, however, that the fact that a drug could be synthesized from materials obtainable in this country does not indicate that this has been the custom in the past or that it would be practicable now.

The drugs in the list are classified as follows: (A) Drugs which are at present either (1) regarded as essential, or (2) readily available. (B) Drugs which are essential for certain purposes but not for others, and in the use of which strict economy should be observed. (C) Drugs which are not essential and do not justify importation or manufacture for home use in wartime. Drugs marked * are specially called for under Acts and Orders of the Ministry of Agriculture.

It is not always possible to follow a logical sequence in classification owing to the frequency of special cases. When several imported drugs have a similar action, one which comes from a sterling area and appears easiest of shipment has usually been chosen for group (A), and the others have been classified (C). Essential drugs have been classified (B) when they are already in short supply or are expected soon to be so, or when they are subject to special Government controls. In such cases prescribers must exercise rigid economy so that a sufficiency of the drugs may be conserved for the purposes for which they are most valuable. No drug which could strictly be described as essential has been placed in category (C), but it must be realized that, owing to shortage of supplies, a few drugs which are deservedly popular have had to be classified in this way. Where drugs have been marked non-essential (C), or restriction has been advised (B), substitutes procurable in this country have been indicated in most cases. In conclusion, the committee wishes to make it clear that this list is primarily intended to secure the wisest economy in drugs for consumption in this country, and that other considerations may affect the importa-

[1] Published as M.R.C. War Memorandum No. 3 by H.M. Stationery Office. Price 3d. net.

tion or manufacture of drugs for the export trade. [To facilitate reference the complete list has been regrouped into the committee's categories.]

A.—Drugs which are at present either regarded as essential or are readily available

Drug	Substitute or Equivalent and Remarks
Acacia	
Acetarsol	
Acidum Acetylsalicylicum	
Acidum Ascorbicum	
Acidum Chromicum (Chromii Trioxidum)	
Acidum Hydrochloricum	
Acidum Hydrocyanicum	
Acidum Mandelicum	
Acidum Nicotinicum	
Acidum Phosphoricum	
Acidum Salicylicum	
Acidum Sulphuricum	
Acidum Tannicum	
Acriflavina	
Adeps Lanae	Under Government control.
Adrenalina, its salts and esters	
Aether	
Aethylis Chloridum	
Aethylmorphinae Hydrochloridum	
Allobarbitonum	
Aloe	
Aloinum	
Alumen	Use ammonium alum only.
Aluminii Acetas	Not to be made from potassium alum.
Aluminii Hydroxidum	Not to be made from potassium alum.
Aminophyllina	See Theophyllina cum Aethylenediamina.
Ammonii Carbonas	
Ammonii Chloridum	
Ammonii Phosphas Acidus	
Amphetamina	
Amylis Nitris	
Amylocainae Hydrochloridum	
Anethum	Production in the United Kingdom should be encouraged.
Aneurinae Hydrochloridum	
Aniline Dyes	These include Bordeaux B, brilliant green, crystal violet, fuchsine, gentian violet, malachite green, methyl violet, and scarlet red.
Anisum	
Antimony Compounds	
Apomorphinae Hydrochloridum	
Areca	
Arecolinae Hydrobromidum	
Argenti Nitras	
Argentoproteinum	
Arseni Trioxidum*	
Atropina and its salts	
Atropinae Methylnitras	
Balsamum Peruvianum	
Barbitonum	
Barbitonum Solubile	
Bario Sulphas	
Belladonnae Folium	
Belladonnae Radix	
Benzocaina	
Benzoinum	Production within the Empire should be encouraged.
Benzylis Benzoas	
Betanaphthol	
Bismuthum Praecipitatum	
Bromethol	
Calamina	
Calciferol	
Calcii Carbonas	
Calcii Chloridum	
Calcii Gluconas	
Calcii Hydroxidum	
Calcii Lactas	
Calcii Sulphas Exsiccatus	
Calx Chlorinata*	
Camphora	Production within the Empire should be encouraged.
Carbacholum	
Carbamide (Urea)	
Carbo	
Carbo Activatus	
Carbonei Dioxidum	
Carbonei Tetrachloridum	
Cardamomum	
Catechu	
Cera	
Chimofonum	
Chloralis Hydras	
Chloramina	
Chlorbutol	
Chlorinated Xylenol	*Para*chloro*meta*xylenol.
Chlorocresol	*Para*chloro*meta*cresol.
Chloroformum	
Chondrus	Production in the United Kingdom should be encouraged.
Chromii Trioxidum (Acidum Chromicum)	
Cocae Folium	
Cocainae Hydrochloridum	
Codeina	Production within the Empire should be encouraged.
Codeina and its salts	
Codeina Phosphas	
Colchici Cormus	Production in the United Kingdom should be encouraged.
Colchici Semen	
Colophonium	
Creosotum	Production within the Empire should be encouraged.
Cresol	
Creta	
Cupri Sulphas	
Derris*	
Diamorphinae Hydrochloridum	
Digitalis	
Digoxinum	
Diodone	
Dithranol	Dioxyanthranol.
Emetina and its salts	See Ipecacuanha.
Ephedra	Production within the Empire should be encouraged.
Ephedrina and its salts	
Ergot Alkaloids	
Ergota	Production within the Empire should be encouraged.
Extractum Fellis Bovini	
Extractum Pituitarii Liquidum (and preparations for intranasal insufflation)	
Extractum Suprarenali Corticis	
Extractum Thyroidei Liquidum	
Ferri Carbonas	
Ferri Perchloridum	
Ferri Sulphas	
Ferrum Redactum	
Fluoresceinum Solubile	
Gelatinum	
Glycerylis Trinitras	
Gold Compounds	
Guaiacol	
Heparin	
Hexobarbitonum	
Hexobarbitonum Solubile	
Hexamina	
Hexylresorcinol	
Histaminae Phosphas Acidus	
Homatropina and its salts	
Hyoscyamus muticus	For manufacture of atropine. Production within the Empire should be encouraged.
Hyoscyamus niger	Production in the United Kingdom should be encouraged.
Hyoscina and its salts	
Indicarminum	
Insulinum	
Insulinum Protaminatum cum Zinco	
Iodoformum	
Iodophthaleinum	
Iodoxylum	
Ispaghula	
Kaolinum	
Kino	
Lead salts	
Leptazolum	
Liquor Calcis Sulphuratae	
Liquor Cresolis Saponatus	Not to be made with potassium hydroxide.
Liquor Ferri Perchloridi	
Liquor Formaldehydi	
Liquor Glycerylis Trinitratis	
Liquor Hydrogenii Peroxidi	
Liquor Picis Carbonis	
Magnesii Carbonas	
Magnesii Oxidum	
Magnesii Trisilicas	
Menthol	Production within the Empire should be encouraged.
Mepacrinae Hydrochloridum	
Mepacrinae Methanesulphonas	
Mersalylum	
Methylis Salicylas	
Methylthioninae Chloridum	
Morphina and its salts	
Neoarsphenamina	
Nicotinamidum	
Nikethamidum	
Nitrogenii Monoxidum	
Nux Vomica	
Oleum Anethi	Production within the Empire should be encouraged.
Oleum Anisi	
Oleum Cadinum	
Oleum Caryophylli	
Oleum Cinnamomi	See Cinnamomum.
Oleum Eucalypti	
Oleum Hydnocarpi	
Oleum Iodisatum	
Oleum Limonis	Production within the Empire should be encouraged.
Oleum Menthae Piperitae	
Oleum Ricini	
Oleum Terebinthinae	Production within the Empire should be encouraged.
Oleum Theobromatis	
Oleum Vitaminatum	
Opium	
Orthocaina	
Oxygenium	
Pamaquinum	
Panzeatinum	
Papainum	
Paraldehydum	
Pentobarbital Sodium	
Pepsinum	
Phemitonum	
Phenacetinum	
Phenobarbitonum	
Phenobarbitonum Solubile	
Phenol*	
Phenolphthaleinum	
Phenothazine	
Physostigmina and its salts	
Physostigminae Salicylas	

Drug	Substitute or Equivalent and Remarks
Pirevan	
Pix Carbonis Praeparata	
Pix Liquida	
Plumbi Acetas	
Plumbi Monoxidum	
Procainae Hydrochloridum	
Proflavina	
Pyroxylinum	
Quassia	
Quinidinae Sulphas	
Quinine salts	
Resorcinol	
Rheum	Production of *Rheum palmatum* in the Empire should be encouraged.
Saccharinum Solubile	
Scoparium	
Senna	
Sera and Vaccines:	
Antitoxinum Diphthericum	
Antitoxinum Oedematiens	
Antitoxinum Staphylococcicum	
Antitoxinum Streptococcicum	
Antitoxinum Tetanicum	
Antitoxinum Vibriosepticum	
Antitoxinum Welchicum	
Serum Antianthracum	
Serum Antidysentericum (Shiga)	
Serum Antimeningococcicum	
Serum Antipneumococcicum I	
Serum Antipneumococcicum II	
Toxinum Diphthericum Calefactum	
Toxinum Diphthericum Detoxicatum	This includes diphtheria toxoid, diphtheria toxoid antitoxin mixture, diphtheria toxoid antitoxin floccules, and alum-precipitated toxoid.
Toxinum Diphthericum Diagnosticum	
Toxinum Staphylococcicum	
Toxinum Streptococcicum Diagnosticum (Scarlatina)	
Toxinum Tetanicum Detoxicatum	
Tuberculinum Pristinum	
Vaccinum Chloreticum	
Vaccinum Pertussis	
Vaccinum Pestis	
Vaccinum Staphylococcicum	
Vaccinum Typho-paratyphosum	
Sinapis	
Soaps	Potash should not be used in the manufacture of soaps.
Soda Lime	
Sodii Aminarsonas	
Sodii Bicarbonas	
Sodii Carbonas*	
Sodii Chloridum	
Sodii Diphenylhydantoinas (Dilantinum Solubile)	
Sodii Iodidum	
Sodii Nitris	
Sodii Phosphas	
Sodii Phosphas Acidus	
Sodii Salicylas	
Sodii Sulphas	
Sodii Thiosulphas	
Stannum	
Stanni Oxidum	
Stibophenum	
Stilboestrol	
Stramonium	Production in the U.K. should be encouraged.
Strychnina and its salts	
Sulphanilamidum	
Sulphapyridinum	
Sulpharsphenamina	
Sulphathiazole	
Sulphur*	
Suraminum	
Theobromina	
Theobromina et Sodii Salicylas	
Theophyllina	
Theophyllina cum Aethylenediamina	
Thymol	Production within the Empire should be encouraged.
Thyroideum	
Thyroxinsodium	
Totaquina	
Tragacantha	Production within the Empire should be encouraged. Methyl cellulose and similar synthetics may be tried as substitutes.
Trinitrophenol	
Tryparsamidum	
Urea	
Ventriculus Desiccatus	
Vitaminis	See Acidum Ascorbicum, Aneurinae Hydrochloridum, Calciferol, Liquor Vitamini A Concentratus, Liquor Vitaminis D Concentratus, Liquor Vitaminorum A et D Concentratus, Acidum Nicotinicum, Oleum Hippoglossi, Oleum Morrhuae, Oleum Vitaminatum.
Zinci Carbonas	
Zinci Oxidum	
Zinci Sulphas	
Zingiber	If the official variety is scarce, supplies from other sources—e.g., Africa,—should be permitted.

B.—Drugs which are essential for certain purposes but not for others, and in the use of which strict economy should be observed

Drug	Substitute or Equivalent and Remarks
Acetonum	Under Government control.
Acidum Aceticum	
Acidum Benzoicum	
Acidum Boricum	Boric acid in Boric Lint is wasted. Reserve for Cataplasma Kaolini and eye lotions. In dermatological practice saline compresses may be used instead of boric fomentations, and for dusting powders boric acid may be replaced by zinc oxide, magnesium trisilicate or kaolin.
Acidum Citricum	Manufacture under Government control.
Acidum Lacticum	
Acidum Nitricum	
Acidum Oleicum	
Acidum Tartaricum and its salts	Raw material is imported. Production within the Empire should be encouraged.
Adeps Benzoinatus	Under Government control.
Agar	Substitute: Ispaghula. Agar should be reserved for bacteriological media. Production within the Empire should be encouraged.
Alcohol	Many tinctures can be replaced by concentrated preparations. Economy is essential.
Amylum	Under Government control. In dermatological practice substitute saline compresses for starch poultices, and for powders see remarks under boric acid.
Aurantii Cortex	Countries of origin: Spain, Sicily, Malta. Production within the Empire should be encouraged. Limited supplies are available from the Empire at present.
Benzaminae *Hydrochloridum*	
Benzaminae Lactas	
Bismuth salts	Reserve for the treatment of syphilis and tropical diseases. Substitutes (for gastro-intestinal conditions): Aluminium hydroxide, chalk, kaolin, magnesium trisilicate.
Bismuth Salicylas	Reserve for the treatment of syphilis and tropical diseases. Substitutes (for gastro-intestinal conditions): Activated charcoal, kaolin.
Borax	In dermatological practice reserve for Unguentum Aquosum. Glycerin of borax and honey of borax may be replaced by aqueous solutions of aniline dyes in the treatment of thrush.
Bromides	Strict economy is necessary.
Caffeina	Omit from compound tablets such as compound aspirin tablets.
Caffeina et Sodii Benzoas	Amphetamine (benzedrine), leptazol (cardiazol), and nikethamide (coramine) are partial substitutes.
Capsicum	Countries of origin: Nigeria, Sierra Leone, E. India. Restrict use of capsicum to manufacture of capsicum wool. Substitute: Sinapis. Colonial varieties of *capsicum* may be obtainable.
Carbromalum	
Caryophyllum	Countries of origin: E. India, Zanzibar, Pemba, Madagascar. Reserve for distillation of the oil.
Cascara Sagrada	Countries of origin: Canada, U.S.A. Production within the Empire should be encouraged.
Chrysarobinum	Production within the Empire should be encouraged. Substitute: Dithranol.
Cinchona	Importation should be restricted to supplies required for the manufacture of quinine. The use of cinchona as a bitter should be discouraged. Production within the Empire should be encouraged.
Corpus Luteum and its preparations	
Cyclopropanum	
Desoxycorticosterone and its esters	Extract of suprarenal cortex is in freer supply.
Dextrosum	Under Government control. Reserve for injection.
Dextrosum Monohydratum	Under Government control. Strict economy is essential.
Extractum Hepatis Liquidum (and preparations of the *active principles of liver*)	Importation of liver is under Government control. Injection therapy is more economical and effective than administration by mouth. Desiccated stomach may be substituted for oral administration.
Extractum Malti	Under Government control.
Extractum Parathyroidei (and parathyroid preparations for parenteral injection)	
Ferri Carbonas Saccharatus	Restrict to children.
Ferri et Ammonii Citras	Not the most economical form of iron: ferrous sulphate is cheaper.
Ferri Lactas	
Ferri Subchloridum Citratum	Not the most economical form of iron; ferrous sulphate is cheaper.
Filix Mas	Reserve for use when other anthelmintics are contraindicated. Production in the United Kingdom should be encouraged.
Galla	
Glucosum	Under Government control. Strict economy is essential.
Glycerinum	Substitutes are under investigation.
Glycyrrhiza	Countries of origin: Spain, Sicily, Italy, Iraq, U.S.S.R. Production within the Empire should be encouraged.
Hydrargyrum	
Hydrargyrum Ammoniatum	
Hydrargyri Iodidum Rubrum	

Drug	Substitute or Equivalent and Remarks
Hydrargyri Oxidum Flavum	
Hydrargyri Oxycyanidum	
Hydrargyri Perchloridum	Substitute: A phenolic antiseptic of the chlorinated phenol type.
Hydrargyri Subchloridum	
Ichthammol	
Injectio Hepatis	
Iodum	Production at home and within the Empire should be encouraged. Adequate supplies are available, but, owing to shortage of alcohol, the use of alcoholic solutions of iodine must be restricted. Substitutes: [illegible] ine, acriflavine [illegible] olet, proflavine
Ipecacuanha	Galenical preparations, expectorants and emetics are not essential and the crude drug should preferably be reserved for the manufacture of emetine. Production within the Empire should be encouraged.
Jaborandi	Reserve for the manufacture of pilocarpine. Production within the Empire should be encouraged.
Jalapa / Jalapae Resina	Reserve for veterinary use. Countries of origin: Mexico, India. Substitute: Colocynth.
Lactosum	
Laevulosum	
Liquor Vitamini A Concentratus	
Liquor Vitamini D Concentratus	
Liquor Vitaminorum A et D Concentratus	
Magnesii Chloridum	Reserve for veterinary use.
Mel	Under Government control.
Oestradiol, Oestriol, Oestrone and their esters	
Oleum Arachis	
Oleum Chenopodii	In Great Britain reserve for veterinary use. Substitutes: Carbon tetrachloride, thymol. Production within the Empire should be encouraged.
Oleum Gossypii Seminis	
Oleum Hippoglossi	
Oleum Lini	Under Government control. Reserve for internal use in veterinary practice.
Oleum Morrhuae	Under Government control. Substitute Oleum Vitaminatum and veterinary vitaminized oils, as applicable, to relieve scarcity.
Oleum Olivae	Under Government control. Arachis and other suitable vegetable oils are recognized as substitutes in official preparations.
Oleum Rapae	Reserve for external use in veterinary practice.
Oleum Sesami	See under Oleum Amygdalae.
Paraffinum Liquidum	Under Government control. Its use should be discouraged.
Paraffinum Molle	Under Government control.
Parathyroideum	
Pilocarpina and its salts	Substitute: Physostigmine and its salts for most purposes.
Pituitarium	Including anterior lobe extracts.
Podophylli Resina	Restrict to Indian Podophyllum.
Potassii Tartras Acidus	See under Acidum Tartaricum.
Prolactin	
Quillaia	Countries of origin: Chile, Peru, India.
Santoninum	Countries of origin: U.S.S.R., Kashmir. Importation difficult. Production within the Empire should be encouraged. Substitutes: Hexylresorcinol, phenothiazine.
Sodii Benzoas	
Sodii Bromidum	
Sodii Citras	See under Acidum Citricum.
Sodii Lactas	Reserve for use as a glycerin substitute.
Sodii et Potassii Tartras	See under Acidum Tartaricum.
Spiritus Aetheris Nitrosi	Substitute: Concentrated solution of ethyl nitrite.
Spiritus Methylatus Industrialis	Under Government control.
Styrax	Country of origin: Asiatic Turkey. Production within the Empire should be encouraged. Wanted for compound tincture of benzoin.
Sucrosum	Under Government control.
Syrupi	The use of all syrups should be discouraged.
Syrupus Ferri Phosphatis Compositus	Reserve for children.
Tinctures	Many tinctures can be replaced by concentrated preparations. Economy is essential.
Urginea	Importation difficult in wartime.
Valeriana	Production in the United Kingdom should be encouraged.
Vitamins	See Acidum Ascorbicum, Aneurinae Hydrochloridum, Calciferol, Liquor Vitamini A Concentratus, Liquor Vitamini D Concentratus, Liquor Vitaminorum A et D Concentratus, Acidum Nicotinicum, Oleum Hippoglossi, Oleum Morrhuae, Oleum Vitaminatum.
Zinci Chloridum	
Zinci Oleostearas	

C.—Drugs which are not essential and do not justify importation or manufacture for home use in wartime

Drug	Substitute or Equivalent and Remarks
Acetylsalicylicum Acidum	Substitutes: Acetylsalicylic acid or phenacetin.
Acidum Glycerophosphoricum and its salts	No substitute necessary
Acidum Hydrobromicum Dilutum	
Aconitum	Countries of origin: Germany, Switzerland, France. Importation unnecessary. Substitute: Benzocaine for local application.
Aethylenum	
Alcohol Isopropylicus	
Amidopyrina	Substitutes: Acetylsalicylic acid, phenacetin.
Balsamum Tolutanum	Countries of origin: Colombia, S. America. Importation unnecessary in wartime. Production within the Empire should be encouraged.
Betainae Hydrochloridum	
Bromoformum	
Buchu	Country of origin: S. Africa. Importation is unnecessary. Substitutes: Hexamine, mandelic acid, scoparium, sulphanilamide.
Calumba	Country of origin: E. Africa (Mozambique). Production within the Empire should be encouraged. Substitute: Quassia.
Cannabis Indica	Countries of origin: India, S. Africa, Zanzibar.
Cantharis / Cantharidinum	Countries of origin: U.S.S.R., Spain, Hungary, China. Importation unnecessary in wartime. Production within the Empire should be encouraged. Substitute: Sinapis.
Carum	Countries of origin: Holland, Germany. Some English caraway is available and its production should be encouraged. Substitute: Anethum (dill).
Cassia	Country of origin: China. Importation unnecessary.
Coccus	Country of origin: Canary Islands. Importation is unnecessary. Substitute: Solution of Bordeaux B. Other good colours are available.
Copaiba	Country of origin: Northern S. America. Importation unnecessary. Substitutes: Hexamine, mandelic acid, scoparium, sulphanilamide.
Coriandrum	Countries of origin: Morocco, U.S.S.R., India, Central Europe. Importation unnecessary. Substitute: Cardamomum.
Cubeba	Country of origin: Malay Archipelago. Importation unnecessary. Substitutes: Hexamine, mandelic acid, scoparium, sulphanilamide.
Cusso	Country of origin: N.E. Africa. Importation unnecessary. Substitutes: Carbon tetrachloride, male fern.
Erythritylis Tetranitras Dilutus	
Ferri Arsenas	Substitute: Ferrous sulphate with arsenic.
Ferri et Manganii Citras	Substitute: Ferrous sulphate.
Ferri et Quininae Citras	Substitute: Ferrous sulphate.
Ferri et Potassii Tartras	Substitute: Ferrous sulphate.
Ferri et Strychninae Citras	Substitute: Ferrous sulphate with strychnine.
Ferri Glycerophosphis	Substitute: Ferrous sulphate.
Ferri Hypophosphis	Substitute: Ferrous sulphate.
Ficus	Therapeutic value doubtful.
Foeniculum	Production in the United Kingdom should be encouraged.
Gelsemium	Country of origin: U.S.A. Importation unnecessary. Substitutes: Synthetic analgesics.
Gentiana	Countries of origin: France, Germany, Spain. Almost unobtainable. Substitute: Quassia. Production within the Empire should be encouraged.
Hamamelis	Country of origin: U.S.A. Production within the Empire should be encouraged. Substitute: Tannic acid.
Injectio Ferri	Substitute: Ferrous sulphate by mouth.
Krameria	Country of origin: Peru. Production within the Empire should be encouraged. Substitute: Tannic acid.
Linum	Substitute: Cataplasma Kaolini for poultices.
Lobelia	Country of origin: Eastern U.S.A. Production within the Empire should be encouraged. Substitute: Stramonium.
Lobelina	Substitutes: Nikethamide, lepturol.
Magnesii Sulphas	Substitute: Sodium sulphate, of which very large supplies are available.
Methylsulphonal	
Oleum Abietis	Country of origin: North-east U.S.S.R. Importation unnecessary. Substitute: Any oil of pine.
Oleum Amygdalae	Production within the Empire should be encouraged. All vegetable oils and fats are under Government control. Arachis or other vegetable oils may be used if available.
Oleum Camphorae Rectificatum	Substitute: Oleum Terebinthinae. See Camphora.
Oleum Cardamomi	Unnecessary.
Oleum Cari	See Carum.
Oleum Crotonis	Unnecessary.
Oleum Gaultheriae	Substitute: Methyl salicylate.
Oleum Santali	Country of origin: India. Importation unnecessary. Substitutes: Hexamine, mandelic acid, scoparium, sulphanilamide.
Pelletierinae Tannas	Countries of origin: Mediterranean countries. Importation unnecessary. Substitutes: Carbon tetrachloride, male fern.
Phenazonum	Substitutes: Acetylsalicylic acid, phenacetin.
Potassa Sulphurata	Substitutes: Sulphur ointment, solution of sulphurated lime.
Potassii Bicarbonas	Substitute: Sodium bicarbonate.
Potassii Bromidum	Substitute: Sodium bromide.
Potassii Chloras	Not essential.
Potassii Citras	Substitute: Sodium citrate.
Potassii Hydroxidum	Substitute: Sodium hydroxide.
Potassii Iodidum	Substitute: Sodium iodide.
Potassii Nitras	Not essential.
Potassii Permanganas	Substitutes: Solutions of other permanganates, other antiseptics.
Psyllium	Countries of origin: Mediterranean countries. Production within the Empire should be encouraged. Substitute: Ispaghula.
Salicinum	Substitute: Sodium salicylate.
Salol	Unnecessary.

Drug	Substitute or Equivalent and Remarks
Scammonium	Unnecessary. Substitute: Indian podophyllum.
Scilla	Country of origin: Sicily. Production within the Empire should be encouraged. Substitutes: Urginea (Indian squill) and other expectorants.
Senega	Countries of origin: Canada and U.S.A. Importation unnecessary. *Substitutes.* Ammonium carbonate, ammonium bicarbonate, ammonium chloride.
Sodii Tauroglycocholas	Substitute: Extract of ox bile.
Sparteina	
Strophanthus	Countries of origin: Mozambique, Nyasaland. Importation unnecessary. Substitute: Digitalis.
Sulphonal	
Syrupus Ferri Phosphatis cum Quinina et Strychnina	Substitute: Tablets of Easton's syrup.
Talcum Purificatum	Raw material imported. For substitutes see under Acidum Boricum.
Tamarindus	Countries of origin: India, Burma, W. Indies. Importation unnecessary.
Taraxacum	Importation unnecessary in wartime. Production in the United Kingdom should be encouraged.

List of Equivalents

Acaprin	Pirevan is identical.
Anaesthesin	
Atebrin	
Atophan	
Atoxyl	Sodii Aminarsonas is identical.
Averin	Bromethol is identical.
Bayer 205	Suraminum is identical.
Benzedrine	Amphetamina is identical.
Cardiazol	Leptazolum of home manufacture is identical.
Coramine	Nikethamide is identical.
Dial	
Dionine	
Doryl	
Eumydrin	Atropinae Methylnitras is identical
Euphyllin	Theophyllina cum Aethylenediamina (aminophyllina) is identical.
Evipan and Evipan Sodium	Hexobarbitonum and Hexobarbitonum Solubile are identical.
Fouadin	Stibophenum is identical.
Germanin	Suraminum is identical.
Luminal and Luminal Sodium	Phenobarbitonum and Phenobarbitonum Solubile are identical.
Medinal	Barbitonum Solubile is identical.
Myosalvarsan	
Nembutal	
Novocain	
Perabrodil	
Plasmoquin	
Prominal	Phemitonum is identical.
Prontosil Album	
Protargol	
Salyrgan	
Urosolectan B	Iodoxylum is identical.
Veronal	Barbitonum is identical.
Yatren	Chinifonum is identical.

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7s. 6d.—*Dr. J. T. Whitley, Chelmsford* (2nd donation).

£388 10s. 11d.—Staffordshire Insurance Practitioners—per Hon. Secretary, Staffordshire Panel Committee: Dr. B. A. Abbott, £4 4s.; Dr. M. B. Baines, 10s.; Dr. E. G. Baird, £5; Drs. Barford and Thompson, £10 10s.; Dr. P. E. Bearblock, £1 1s.; Drs. Beasley and Smith, £17 10s.; Dr. E. R. Boyd, £2 2s.; Drs. Bradford and Paterson, £8 12s.; Dr. G. H. Brown, £5 5s. (2nd donation); Dr. R. N. Bullock, £1 1s.; Dr. W. D. Calderwood, £5 5s.; Dr. G. C. Campbell, £5 5s.; Dr. R. H. Carter, £2 12s.; Dr. J. M. Cowan, £3 3s.; Dr. W. H. Cruickshank, 10s.; Dr. G. W. Curtis, £2 2s.; Dr. J. A. Davenport, £5 5s.; Dr. G. J. G. Davidson, £2 2s.; Drs. Dingley, Wilson, and Shaw, £11 5s. 4d.; Dr. J. R. Eden, £5 5s.; Drs. Eunson and Coutts, £6 6s.; Dr. A. Fazan, £2; Drs. Fraser, Morris, and Pawson, £9 19s. 6d.; Dr. A. Frost, £10 10s.; Dr. W. Goldie, £1 1s.; *Dr. F. W. Harrowell*, £2 2s.; *Dr. F. H. Hawley*, £3 3s.; Dr. E. Heard, £3 3s.; Drs. Herbert and Herbert, £5 5s.; Dr. A. B. Hodgson, £2 2s.; Dr. J. R. Hollick, £1 1s.; Dr. T. S. F. Hudson, £5; Dr. T. Hutchinson, £1 5s.; Dr. G. P. W. James, £3 3s.; Dr. E. R. Jones, £2 14s.; Dr. C. O. Keating, £1; Dr. A. King, £2 3s.; Dr. J. M. Kirkwood, £3 3s.; Dr. V. M. Lambah, £1 1s.; Dr. L. Lowe, £5 5s.; Drs. Low and Yates, 10s. 6d.; Dr. W. Lowson, £3 3s.; Dr. F. W. Marshall, £2 2s.; Dr. M. MacCormac, £2 2s.; Dr. D. T. McAnish, £3 3s.; Dr. J. M. McBean, £10 10s.; Dr. R. J. McCloskey, £5 5s.; Dr. J. A. McGeouch, £5 5s.; Drs. McQueen and Ribchester, £6 6s.; Drs. R. F. Middleton, £2 2s.; Dr. R. G. Miller, £10 10s.; Dr. A. D. Millington, £10; Dr. V. E. Milne, £2 2s.; Dr. J. G. Mitchell, £3 3s.; Dr. A. Montgomery, £3 3s.; Drs. Murphy and Phipps, £5 5s.; Dr. W. W. Nock, £2 2s.; Dr. P. J. O'Brien, £5; Dr. P. W. Parkes, £2 2s.; Dr. C. G. Parsons, £1 1s.; Drs. Plant, Tweddell, and Anderson, £11 11s.; Dr. S. T. Pettirger, £6 6s.; Dr. H. Procter, £5 5s.; Dr. L. D. Roberts, £4 4s.; Dr. A. V. Russell, £1 1s. (2nd donation); Dr. E. A. Sadler, £5; Dr. T. D. S. Shaw, £4; Dr. H. M. Shenkin, £5 5s. (2nd donation); Dr. C. H. Sherwood, £6; Dr. E. G. Sherwood, £5; Dr. J. J. Silke, £1 1s.; Dr. J. H. Simpkiss, £1 1s.; Drs. Somerville and Hallowes, £6; Dr. C. L. Speckman, £5 5s.; Drs. Stirling, Roberts, and Williams, £13 11s. 7d.; Dr. J. G. Stooke, £5 5s.; Dr. K. W. Stroude, £3 3s.; Dr. A. W. Tibbetts, £5 5s.; Dr. G. M. Torrance, £5 5s.; Dr. M. S. Toukby, £2 2s.; Dr. D. S. Twigg, £2 2s.; Dr. C. H. Waddell, £6 6s. (2nd donation); Dr. A. Walker, 13s.; Dr. R. P. Walker, 10s. 6d.; Dr. P. Wallace, £2 2s. (2nd donation); Dr. J. A. R. Wells, £1 5s.; Dr. W. E. Wells, £5 5s.; Dr. A. B. Wilson, £3 13s. 6d.; Dr. G. I. Wilson, £5 5s.

£295 13s. 6d.—Per Dr. J. Inglis Cameron, Glasgow Division: Dr. P. J. O'Hare, £21; Dr. J. A. Conway, £21; *Dr. R. Tennant*, £10 10s.; Dr. A. Cameron, £10; Prof. J. Shaw Dunn, £5 5s.; Dr. W. D. Anderson, £5 5s.; Dr T. K. Monro, £5 5s.; Dr. R. Aird, £5 5s.; Dr. W. P. A. Stewart, £5 5s.; Dr. J. M. Renton, £5 5s.; Dr. J. S. Wright, £5 5s.; Dr. David McKail, £5 5s.; Dr. W. T. Davie, £5 5s.; Dr. D McIntyre, £5 5s.; Dr. J. Coutts, £5 5s.; Dr. D. Coutts, £5 5s.; Dr. J. B. Stewart, £5 5s.; Dr. A. McCrorie, £5 5s.; Dr. J. H. Robertson, £5 5s.; Dr. R. A. K. Harper, £5 5s.; Dr. J. Beck, £5 5s.; Dr. D Kyle, £5 5s.; Dr. A. Innes, £5 5s.; Dr. M. Gilchrist, £5 5s.; Dr. J. Y. Campbell, £5 5s.; Dr. H. M. Calder, £5 5s.; Dr. E. M. E. Cumming, £5 5s.; Dr M Davidson, £5; Dr. R. Murray Lyon, £5; Dr. S. Armstrong, £5; Dr. W. A. Campbell, £5; Dr. W. Rankin, £5; Dr. P. Lavery, £3 3s.; Dr. D. Yellowlees, £3 3s.; Dr. H. W. Thomson, £3 3s.; Dr. J. Cook, £3 3s. (2nd donation); Dr. S. Dunn, jun., £2 2s.; Dr. H. McNeil, £2 2s.; Dr. A. Glen, £2 2s.; Dr G. Montgomerie, £2 2s.; Dr. T. Stewart Barrie, £2 2s.; Dr. T. O. Howie, £2 2s.; Dr. G. G. Graham, £2 2s.; Dr. R. B. Ness, £2 2s.; Dr. W. Russell, £2 2s.; Dr. W. K. Anderson, £2 2s.; Dr. S. Graham, £2 2s.; Dr. A. B McLean, £2 2s.; Dr. J. Dunbar, £2 2s.; Dr. H. T. Wingate, £2 2s.; Dr W. MacEwen, £2 2s.; Dr. R. Steen, £2 2s.; Dr. J. S. McKendrick, £2 2s.; Dr B. Robertson, £2; Dr. A. B. Sloan, £2; Dr. A. A. McManus, £1 1s.; Dr D. R. Patterson, £1 1s.; Dr. N. D. Wattie, £1 1s.; Dr. A. M. Sutherland, £1 1s.; Dr. J. J. McKenzie, £1 1s.; Dr. W. S. Syme, £1 1s.; Dr. J. S. Buchanan, £1 1s.; Dr. D. McWalter, £1 1s.; Dr. M. T. Moore, £1 1s.; Dr I. Mitchell, £1 1s.; Dr. A. T. Kennie, £1 1s.; Dr. A. A. Dewar, £1 1s.; Dr. R. M. Sinclair, £1 1s.; Dr. M. Mitchell, £1 1s.; Dr. A. D. McLachlan, £1 1s.; Dr. E. J. Primrose, £1 1s.; Dr D. A. Primrose, £1 1s.; Dr. A. C. Aitkenhead, £1 1s.; Dr B. Binnie, £1 1s.; Dr. F. A Murray, £1 1s.; Dr. G. H. Campbell, £1 1s.; Dr A. F. Campbell, £1 1s.; Dr. H. H. Pinkerton, £1 1s.; Dr. I. Hoppenstein, £1 1s.; Dr. J. C. Hunter, £1; Dr. J. C. Forsyth, £1; Dr. D. Valerio, £1; Dr V. D. Bruce, 10s.; Dr. G. B. Brand, £5 5s.; Dr. G. A. Allan, £3 3s.; Dr. J C. Laurie, £2 12s. 6d.; Dr R. Wilson, £2 12s. 6d.; Dr. A. Whyte Cassie, £2 12s. 6d.; Dr C. H. Browning, £2 2s.; Dr. W. W. Galbraith, £2 2s.; Dr. J. Henderson, £1 1s.; Dr. K. R. T. Matthew, £1 1s. (The cost of collection was £16 3s.)

£129 6s.—Per Mr. J. Lewin, Hon. Secretary, West Norfolk Division: Dr. O. L. Appleton, £1; Dr. C. R. H. Ball, £5; Dr. C. V. Devlin, £10 10s.; Dr. T B R. Philip, £2; Drs. Norman, Arthur, and Chappel, £3 3s.; Dr. E. Holmes Watkins, £5; Dr. J. J. D. Naismith, £1 1s.; Dr. A. B. Dummere, £10 10s.; Mr F. H. Sturdee, £10 10s.; Dr. T. S. Acheson, £2 2s.; Dr. J. Gibb, £5 5s.; Drs. Humphris and Dean, £5 5s.; Dr. M. Chadwick, £5 5s.; Mr. J. Lewin, £5 5s.; Mr. J. O. Harrison, £5 5s.; Drs. Thorp and Barker, £2 2s.; Dr. A. J. Hawes, £5 5s.; Dr. S. M. Wilcox, £2 2s.; Drs. Uloth and Speight, £5; Drs. W. G. and H. Greer, £2 2s.; Dr. J. W. McIntosh, £1 1s.; Dr. S E. Paterson, £2 2s.; Drs. H. and J. Calder, £2 2s.; Dr H. R. J. Thomas, £10 10s.; Dr. C. S. Hall-Smith, £5 5s.; Dr P. S. Marshall, £5 5s.; Drs. Sutton, Sexton, Fogarty, and Horgan, £10 10s. (The cost of collection was £1 1s.)

£93 19s. 6d.—Per Mr. G. A. B. Walters, Lincoln Division: Dr. H. W. Vaughan, £2 2s.; Mr. J. Rainforth, £2 2s.; Dr. Willoughby Smith, £1 1s.; Dr. G. D. Summers, £1 1s.; Dr. L. T. Dean, £10 10s.; Dr. A. Davis, £1 1s.; Dr. H. C. Barlow, £5; Dr. A. F. Cowan, £1 1s.; Dr. E. C. Ritter, £1 1s.; Dr. G. Lowe, £2 2s.; Dr. W. F. Stuell, £2 2s.; Dr. S. Wray, £5 5s.; Dr. J. Gray, £1 11s. 6d.; Mr M Backwell, £2 2s.; Dr. P. S. Cheshire, £1 1s.; Dr. L. Boys, £2 2s.; Dr. W. S. H. Campbell, £1 1s.; Dr. J. D Smith, £5; Dr. T. R. Fulton, £1 1s.; Dr. D. Lynch, £3 3s.; Dr. W. P. Roe, £1 1s.; Dr. W. A. Briggs, £5; Dr. E. W Woodbridge, £1; Dr. W. Brownlie, £5 5s.; Dr. W. Sharrard, £2 2s.; Mr. E. J. Bilcliffe, £5 5s.; Dr. M. Kent, £1 1s.; Dr. G. S. Deane, £3 3s.; Dr. D. F. Torrens, £5 5s.; Dr. T. O'Brien, £3 3s.; Dr. A. S. Green, £5; Mr. G. A. B Walters, £5 5s. (2nd donation).

£52 10s.—Hon. Medical and Surgical Staff of the Bradford Royal Infirmary.

£39 18s.—Practitioners in the area of the Morpeth Division—per Dr Stephenson. 1st List. Dr. C. R. Blaiklock, £2 2s.; Dr. T. S. Blaiklock, £2 2s.; Dr. *H. Skinner Brown*, £5 5s.; *Dr. M. Bruce*, £2 2s.; Dr. G. R. East, £3 3s.; Dr. R. Gibson, £2 2s.; Dr. W. R. S. Good, £3 3s.; Dr. R. Hickes, £2 2s.; Dr. A. B. H. Irvine, £2 2s.; Dr. M. Maclean, £2 2s.; Dr. B. B. Noble, £2 2s.; Dr D. G. O'Driscoll, £2 2s.; Dr. G. Spence, £2 2s.; Dr. D Reive, £2 2s.; Dr. W. Stephenson, £3 3s.; Dr. J. Walker, £2 2s.

£32 3s. 6d.—*Per Dr. A. C. S. Waters, Isle of Ely Division.*

£26 5s.—The Thurrock Medical Society—per Dr. Headon.

£21.—Per Dr. Bisset-Smith, Ashton-under-Lyne L.M.W.C.: Dr. W. Cameron, £5 5s.; Dr. J. V. Fiddian, £5 5s.; Mr. M. Mamourian, £5 5s.; Dr. R. Bisset-Smith, £5 5s.

Practitioners in the Shropshire and Mid-Wales Branch area—per Dr. G Mackie (amount already sent, £136 11s.): Dr. G. W. Thompson, £3 3s.; Dr. G. Wedd, £3 3s.; Dr. A. R. McClure, £3 3s.; Dr. J. Prentice, £3 3s.; Dr. W. R. H. Pooler, £3 3s.; Dr. S. N. Browne, £2 2s.; Dr. J. Sowerbutts, £3 3s.

£12 19s.—Per Dr. W. Smith, Chairman, Greenwich and Deptford Division: Anonymous, £2; Dr. J. D. Gebbe, £1 10s.; Dr. J. Loftus, £2 2s.; Dr. J. Montgomery, £1 1s.; Dr W. Smith, £2 2s.; Dr. F. R. Waldren, £2 2s.; Dr. D. Wilson, £2 2s.

£10 10s.—Doctors in the Isle of Man—per Dr. D. Pantin (amount already sent, £15 4s.): Dr. P. W. Hampton, £5 5s.; Dr. C. J. Jowett, £2 2s.; Dr. G. B. Harland, £3 3s.

£8 8s.—Northamptonshire Medical Charity—per Dr D. G. Greenfield (amount already sent, £444 19s. 6d.): Dr. S. H. G Humfrey, £5 5s.; Dr. E. Robertson, £3 3s.

£7 7s.—Per Dr. H. Campbell Orr, South Staffs L.M.W.C. (amount already sent, £58 11s.): Mr. C. V. Patrick, £5 5s.; Dr. E. H. Coleman, £2 2s.

£4 4s.—Practitioners in Outer Islands Division—per Dr. Hector Macdonald (amount already sent, £32 10s.): Dr P. A. Macleod, £3 3s.; Dr. D. Campbell, £1 1s. Practitioners in the area of the Leigh Division—per Dr. *J. H. Yoxall* (amount already sent, £47): Dr. N Goldstone, £2 2s.; Dr. R. Hamilton, £2 2s.

£3 3s.—The practitioners in the area of the East Yorkshire Branch—per Dr. E. M. Beam (amount already sent, £93 3s.): Dr. E. W. Dunkley. Per Dr. J. M. Johnstone, N. Staffs. L.M.W.C. (amount already sent, £745 15s.): Dr. C. H. Mott.

£1.—Per Dr. Mabel Ramsay, Plymouth (amount already sent, £279 4s. 6d.): Dr. H. C. C. Reid (4th donation).

Local Medical and Panel Committees

£82 1s. 4d.—Norwich.

£20.—Bedfordshire (2nd donation).

Total—£19,282 15s. 10d. and £100 3½% Conversion Stock

EMPLOYMENT OF ALIEN DOCTORS IN HOSPITALS

The following modifications in the restrictions placed on the employment of doctors of enemy nationality in hospitals and similar institutions are announced by the Ministry of Health in a circular (No. 2312) just issued to local and hospital authorities. The modifications are being made in view of the shortage of doctors; the restrictions at present in force affecting other staff (including nurses) as set out in Circulars 2080 and 2193 issued on July 3 and November 4 last will continue to apply.

Doctors of German, Austrian, or Italian nationality qualified to practise in this country either under the ordinary law or under the special provisions of the Medical Practitioners (Temporary Registration) Order, 1941, or selected for employment with a view to registration under the latter provisions, may now be employed in any hospital (whether or not in a protected area), which may provide treatment for members of His Majesty's Forces subject to the following conditions:

(*a*) The employment of such aliens must be on the understanding that, in the event of invasion or other serious military situation which would make it necessary for the military authorities to take full control of the area, the military authorities may find it necessary to order the immediate removal from the hospital of the persons in question.

(*b*) Wherever practicable such aliens should be employed only in wards where British doctors and nurses are also engaged.

(*c*) The number of such alien doctors employed in any hospital must not exceed the following proportions of the total medical staff employed there: hospitals with less than 100 beds, 20%; hospitals with 100 beds or over, 10%.

Condition (c) of Circular 2193 is now modified in its application to doctors of enemy alien nationality to the extent that they may be employed in separate wards set apart for Service patients, subject to the conditions laid down in the previous paragraph.

In any case, an individual permit from the Aliens War Service Department will still be required before an alien can be employed in a hospital which may provide treatment for Service patients. In ordinary circumstances such a permit is not likely to be refused unless it is found that there is reason to think that the applicant might be a danger to national security, but there may be a few exceptional localities from which it may be necessary to continue to exclude persons of enemy alien nationality for reasons of defence.

SCHEME OF CO-ORDINATION FOR HACKNEY'S MEDICAL SERVICES

We have received the following details of a scheme for co-ordinating Hackney's war medical services. The authors, Drs. A. Phillips, P. J. Murnane, M. B. Jay, and C. K. David, state that it is the outcome of discussions by local practitioners, who were much dissatisfied with the borough's war medical services, and felt that no effort was being made to enlist the majority of doctors who were eager to participate in the war effort. It is understood that the scheme is being submitted to the local and central authorities for approval.

The Scheme

The main principle of the scheme is the centralization of the war medical services at the present first-aid posts, all the medical services to be carried out by a rota of doctors working from the posts. At present we have shelter work, rest centres, first-aid posts, and mobile units; this list will probably be increased as the war proceeds. There is no co-ordination between the various medical services. Under this scheme all the services and any additional ones will operate from the first-aid posts. The advantages are:

1. The F.A.Ps are so situated that practically every area in the borough is not more than half a mile from a post. Thus the borough is, for this scheme, divided into five areas.

2. When any medical service is required there will be only one point in each area to which the public, shelter marshals, wardens, fire service, or police should apply for medical aid.

3. A rota of doctors will serve at these points. In this way all the doctors willing to serve will be available, and the work will be fairly distributed.

4. If at any time the work of any branch of the service is suddenly increased this can be easily met, or if all the work is decreased or diminished the necessary adjustments can be easily made.

5. Finally, all the fees accruing from these appointments will be divided among the doctors working the scheme.

We have thus a system which is elastic and allows for eventuality. It will provide a better and more uniform ser for the public, and will obviate the need for making appointments every time there is a change in enemy tac At each F.A.P. there will be a rota of doctors who wish serve and who live within the area served by the post: estimate that there should be about ten doctors attached each post.

The duties will be as follows:

1. Two doctors will be on duty for twenty-four hours and at the F.A.P. during the hours of black-out. One of these doc will visit the larger shelters in the vicinity at night and will st by for them; the other doctor will stand by for any emerge calls at the smaller shelters. The work will be so arranged t the post is never left without a doctor at night.

2. During the day both these doctors will be on call for usual F.A.P. duties. The doctor doing the "larger shelter" dut that night will notify the post of his whereabouts as soon as alert is sounded.

3. One doctor of each rota will be elected to be directly respo sible to the M.O.H. for the special duties of the F.A.P. (preferer being given to the present holders of the post), such as the traini of personnel and working the rota. He will receive an additio fee for the extra responsibility this entails.

4. The rest centres in the same vicinity will be visited during t day by the doctor doing duty at the smaller shelters.

There will be a separate rota for the mobile unit. These men w be responsible for the units and will have no other duties. Prefe ence will be given to the present holders of this appointment if th so wish.

The financial arrangements of this scheme are based on t present rates of pay for the various duties. All these sums a to be pooled. The doctors responsible for the F.A.Ps to th M.O.H. will receive an additional £75 a year. The remainin sum will be divided equally among the doctors on the rota. We estimate that at the present rate of pay, and allowing for rota of ten doctors per post, each doctor will receive abou £200 p.a.

WEEKLY POSTGRADUATE DIARY

FELLOWSHIP OF MEDICINE, 1, Wimpole Street, W.—*Brompton Hospital*, S.W. Mon. and Thurs., 4.45 p.m., M.R.C.P. Course in Chest Diseases. *West End Hospital for Nervous Diseases*. Tues. and Fri., 3.30 p.m., Clinical Demonstrations in Neurology. *Royal National Orthopaedic Hospital*, Stanmore. Sat., 2.15 p.m., F.R.C.S. Clinical Orthopaedic Course. *Medical Society of London*, 11, Chandos Street, W. Wed., 2.30 p.m., Final F.R.C.S. Theoretical Orthopaedics.

DIARY OF SOCIETIES AND LECTURES

ROYAL SOCIETY OF MEDICINE

Section of Medicine.—Tues., 2 p.m. Discussion: Dyspepsia in the Forces. Openers, Col. H. L. Tidy, Dr. Charles E. Newman, and Major J. G. Scadding.

Section of Psychiatry.—Tues., 2.30 p.m. Paper by Dr. Aubrey Lewis: Psychiatric Aspects of Effort Syndrome. A discussion, to be opened by Dr. W. H. Gillespie, will follow.

Section of Urology.—Thurs., 4.30 p.m. Discussion: Personal Experience of Injuries to the Genito-urinary Tract. Opener, Mr. G. E. Nelson.

Section of Epidemiology and State Medicine.—Fri., 2.30 p.m. Paper by Surgeon Rear-Admiral S. F. Dudley and Surgeon Commander W. G. C. Fitzpatrick: Epidemiology of Pulmonary Tuberculosis in the Royal Navy, especially as regards the Use of Miniature Radiography in its Elucidation. Members of the Clinical, Medicine, and United Services Sections are specially invited to attend the meeting.

DAVYHULME MILITARY HOSPITAL MEDICAL SOCIETY.—*Thurs.*, 3 p.m. Discussion: Deformities of the Hands and Feet. To be opened by Prof. Harry Platt. Medical men and women in any Services (including civilian) will be welcomed.

Branch and Division Meetings to be Held

GLASGOW AND WEST OF SCOTLAND BRANCH.—At 39, Limbank, Crescent, Glasgow, Sunday, March 23, 3 p.m., Drs. J. Nairn Hay and G. L. Pallen, "Recent Developments in the Diagnosis and Treatment of War Gas Casualties." All practitioners in the area of the Branch are invited to attend.

NORTH OF ENGLAND BRANCH.—At Newcastle-upon-Tyne, Thursday, March 27, 2.30 p.m. Lord Horder, "Air raid Shelters and Health"; 3.45 p.m., Drs. J. C. Spence, T. H. Boon, George Davison, and G. A. Smart, Clinical demonstrations. Members of the Services stationed in the area of the Branch are invited to attend.

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 5s. 6d. The amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

BIRTHS

MACLEOD.—At Viewfield, Selkirk, on March 4, to Nancy (née Scott), wife of Captain William Macleod, R.A.M.C., a son.

YOUNG.—At Norwood Nursing Home, Glasgow, on March 16, 1941, to Dr. and Mrs. A. Kenneth Young (Mary Lewis), Cathcart View, Paisley Road, Ironshore, a son.

DEATH

BEAN.—On the 11th inst., at 36, Hollybush Road, Hindhead, Surrey, Alexander D. Hall's Burn, M.D.(Edin.), aged 73 years. Funeral, Cremation, Woking, on Thursday, March 13, at 3 p.m. No flowers by request.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 29 1941

USE OF A GLYCERIN–SULPHONAMIDE PASTE ("EUGLAMIDE") IN TREATMENT OF BURNS

BY

J. M. ROBSON, M.D., D.Sc.

Lecturer in Pharmacology, University of Edinburgh

AND

A. B. WALLACE, M.B., F.R.C.S., M.Sc.McGill

Surgeon, Scottish Emergency Medical Service; Assistant, Department of Surgery, University of Edinburgh

(From the Departments of Pharmacology and Surgery, University of Edinburgh)

Since the introduction of the tannic acid technique much progress has been made in the treatment of burns, though there have always been difficulties that have been only partially overcome. The limitations in our present knowledge have, however, been emphasized by the unusual conditions prevailing during the war. In civil life the lesions were mainly scalds and therefore of second degree, except in parts becoming septic, when lesions of the third degree developed.* In war the proportion of burns of the third degree is relatively high, and the problem of dealing with these lesions and their sequels has become much more important.

General Principles

The principles governing the treatment of burns are generally established. Thus it is recognized that the first aim is to save life, the second to avoid infection, and the third to prevent deformity. If life is endangered the consideration of paramount importance is the prevention of secondary shock. This is done by maintaining the body temperature and by the administration of a sedative and of intravenous plasma or serum; then, as soon as is practicable, the burnt area is cleansed and tanned.

In many cases already seen in the present war life has not been endangered, and yet the treatment has not been successful in preventing sepsis and deformity. These unfortunate results have been due essentially to the indiscriminate or faulty use of coagulating agents without consideration of the depth and site of the injury. In the case of third-degree burns there is total destruction of skin, and this lost skin has to be replaced by grafting, whatever the preliminary line of treatment adopted. The ideal mode of treatment is therefore one which as rapidly as possible will give a clean surface suitable for grafting. Up till now tanning has been the method of choice, but it has invariably resulted in infection. Under these conditions the tan separates slowly, leaving an unhealthy granulating surface. It is therefore obvious that this way of dealing with third-degree burns is unsatisfactory, and that there is an urgent need for a more efficient procedure.

The treatment of burns of the face and hands has presented special difficulties. In so far as the face is concerned the problem is mainly that of the third-degree burn, which, even when small, is apt to produce disfigurement on healing. The treatment of second-degree burns of the face should present no special difficulties: there is no complete destruction of the skin, and therefore the use of coagulating agents should give satisfactory results. Nevertheless a number of workers who have used tanning agents have experienced difficulties in such cases.

The greatest problem, however, and one of urgent interest, is the treatment of burns of the hands. The present method of treatment in such cases is by no means satisfactory, and this applies not only to third-degree burns but even to lesions of the second degree. Those who have seen the unfortunate results of the indiscriminate application of tannic acid to burns of the hands will be convinced that the general use of coagulating agents should not be advocated; oedema and sepsis under a rigid tan, together with prolonged immobilization, have played their part in producing limitation of movement, contracture, and, in extreme cases, ischaemic necrosis.

The New Method

The method of treatment described below was evolved for the purpose of meeting these very obvious difficulties. In principle it consists in the application to the burnt area of a water-soluble sulphonamide in solution in glycerin. The sulphonamide compound albucid soluble was chosen because it was freely soluble in water, formed a neutral solution, and was known to be innocuous to tissues. It appears probable that other sulphonamide compounds which possess the qualities mentioned above would be equally effective, but limitations of time and clinical material have so far prevented the carrying out of comparative tests of different compounds.

Glycerin by itself is unsuitable for local application to the surface of the body. The albucid solution was therefore converted into a paste by the addition of a suitable quantity of kaolin. Since the paste contains a glycerin–kaolin mixture it produces the effects usually associated with cataplasma kaolin. Thus there is an increase in the flow of lymph containing antibodies and white blood corpuscles; this will tend to increase the local defence mechanism. The flow of tissue fluids together with the absorption of water by the glycerin helps to reduce the oedema, which is an undesirable feature of burns in certain localities. Preliminary observations showed that the paste tended to dry in the centre of the area of application, consequently a small quantity of cod-liver oil was incorporated. Incidentally, it is possible that this may have additional advantages—e.g., a beneficial effect on tissue repair and a local soothing action.

* In a first-degree burn there is erythema of the affected part: in a second-degree burn partial destruction of skin with or without vesication: and in a third-degree burn total destruction of skin.

Such a paste can be of value only if it does not cause any irritation. It has been found in practice that, though there may be slight pain when it is first applied to the injured area, this very rapidly passes off and does not recur. On the contrary, our experience suggests that in some cases the paste possesses an appreciable soothing effect.

The treatment of burns with this paste allows of early movement. This is of considerable importance, since the immobilization of the affected parts associated with the use of coagulating agents is an important factor in preventing the subsequent restoration to normal functional activity.

Method of Preparing the Paste.—5 grammes of soluble albucid powder is mixed with 100 c.cm. of glycerin; the mixture is then heated cautiously until the solid is completely dissolved. This usually takes about thirty minutes, the mixture being stirred from time to time. The heating is then discontinued; while the mixture is still warm 10 c.cm. of cod-liver oil is added, being thoroughly stirred in. This solution is mixed into a quantity of fine kaolin (about 80 grammes) sufficient to yield a smooth paste of the consistence of thick cream. The mixing is done in a mortar, and, later, on a white slab with a spatula, in order to produce a smooth permanent paste.

Clinical Results.—The paste has been used with success in burns of the hand (second and third degrees), the face and scalp (second and third degrees), the buttock (second and third degrees), the penis and scrotum (second degree); in septic burns, following twenty-four hours of wet dressings; and in burns of the second degree not extensive in area.

The value of the paste in certain conditions—e.g., bedsores, carbuncles—is also being investigated, and it is hoped to report on the results at some future date.

Technique of Application

An anaesthetic may be required for cleansing, but this is not essential, except in most children, in whom fear and apprehension are prominent. Before intervention, cultures are made from the surface of the burn and from blister fluid, and these are repeated every second or third day. In second-degree lesions the affected part is cleansed with gauze wrung out of isotonic saline at body temperature. Blisters and loose epidermis are snipped and removed. In third-degree burns the surface is gently washed with warm physiological saline and all foreign material removed.

In applying the paste a thick spread is made on sterile white lint, gauze, or linen; for burns of the face a mask is cut out. Further dressing is applied if necessary, and the whole is covered with wool and bandaged. In burns affecting the face and in the region of flexures the paste and dressings are reapplied daily, but in other parts they may be kept on for three days before being changed. Where infection is present it is essential, in order to maintain a high local concentration of the sulphonamide, that daily reapplications of the paste be made, no matter the site. At each change of dressing the affected part is wiped clean with wool pledgets soaked in normal saline or cod-liver oil.

Most of the burns treated have been of the second degree, and have occurred in children. In this series neither the interval between the occurrence of the injury and admission to hospital nor the nature of the first-aid treatment appeared to influence the ultimate result. Undoubtedly some regions responded in a very promising manner to the application of the paste—e.g., the hands, the face, the abdomen, the buttocks, the feet, and the penis and scrotum; other areas—e.g., the axilla and shoulder region—showed less response but nevertheless did well. In several patients anaesthesia was not required for preliminary cleansing. Pain was experienced on application of the paste in only a few instances, and irritation was absent. As a rule an early healing surface was obtained, as can be judged from the period during which the patient remained in hospital (see accompanying table).

The rate of healing with the paste (termed "euglamide") compared favourably with that obtained with tannic acid in the two cases in which both methods were used (Nos. 8 and 15). In each of these cases the burn on one hand was treated with silver nitrate while paste was applied to the burn on the other; the hands treated with paste healed and showed normal function before the coagulum on the other hands had begun to separate. In Case 4 (treated originally with charcoal-silver nitrate jelly) the healing properties of the paste when applied to a septic granulating surface compared very favourably with those of acriflavine under the same conditions. Initial sepsis appears to be an indication for the application of euglamide. In such patients the routine adopted up to the present is as follows: hot boric fomentations are applied every four hours for one to two days; a thick spread of the paste is then put on once daily in order to maintain a high local concentration of albucid.

Very satisfactory results were obtained in facial burns. The method of treatment in such cases has, moreover, the additional advantage that it allows the patients a certain amount of freedom, which cannot be permitted if tannic acid has been used.

So far we have had the opportunity of employing the paste in only a few burns which involved the whole depth of the skin, but the results have been promising, as is illustrated by the following case:

Case 7 had a third-degree burn of the dorsum of the hand, which was treated with euglamide from the first. The natural coagulum separated on the fifteenth day and left a granulating area of healthy appearance; at this stage a culture gave a sparse growth of *Staph. aureus*. There was complete absence of oedema and of neighbouring inflammatory reaction, while movements of the tendons were free from the first. Pain was notably absent.

Our experience with another patient suggests that the paste may prove to be very valuable in the treatment of burns of the penis and scrotum:

On admission this patient (Case 19) showed very marked local oedema. The insertion of an indwelling catheter was contemplated, but since urine had been voided just before admission the procedure was delayed. The paste was applied, and the following morning the oedema, though still pronounced, was definitely less, and catheterization proved unnecessary. A steady improvement followed.

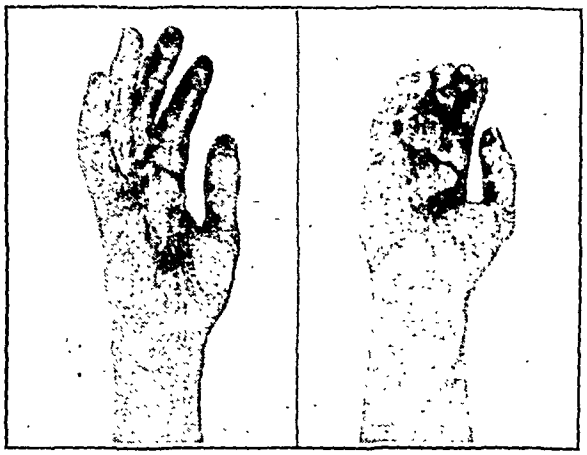
The paste has proved of value in burns which had become septic after the use of a coagulating agent; in these cases euglamide was applied to the unhealthy granulating surface remaining after removal of the coagulum, and rapid healing was promoted (Cases 16 and 17).

The history of Case 20 is interesting (see Figs. 1–4). This patient had second-degree burns of the right hand affecting the thenar eminence, a small area of the palm, and the second and third finger clefts from the web to the level of the distal interphalangeal joint. Tannafax jelly had been applied immediately by the medical attendant; six hours later this was removed at the casualty hospital and four-hourly saline compresses were ordered. When first seen by us one week later the condition was unsatisfactory: the patient complained of local pain, severe enough to keep him awake at night; the raised epithelium had been only partly removed from the burn and there was a considerable amount of dead skin left; the areas exposed were raw, tender, and inflamed; the blister on the palm was still intact; and movement of the fingers at the metacarpo-phalangeal joints was limited to 30 degrees of

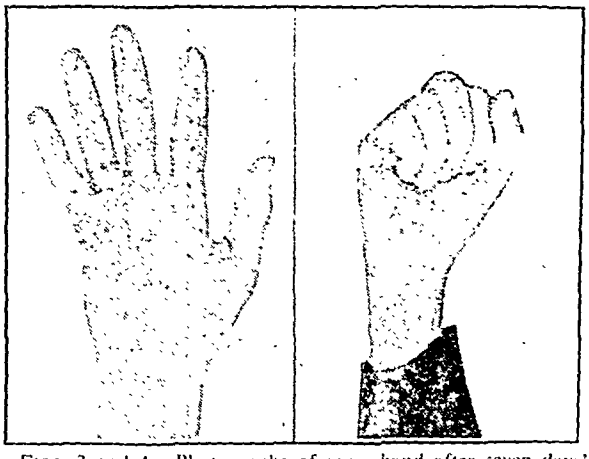
Table showing Results in a Series of Burns Treated with Euglamide

Case No.	Age (Years)	First-aid Treatment	Time elapsed till Admission	Nature of Lesion	Depth and Extent	Anaesthetic	Treatment	Days in Hospital	Remarks
1	1+	Boric ointment	30 hrs.	Scald	2nd and slight 3rd degree, left iliac fossa	Gas-and-oxygen	Cleansed; paste applied; reapplication every 3rd day	12	Application painless; non-irritant; early healing surface of tanned
2	6−	Soapy water and olive oil	1 hr.	,,	2nd degree, upper arm, forearm, and hand	,,	Cleansed; paste applied to upper arm and reapplied every 3rd day; other areas tanned	6 (tran to isolation hospital)	Remarks on Case 1 apply equally well
3	2−	Vaseline and starch	24 hrs.	Burn	Small 2nd and 3rd degree, buttock	None	Cleansed; fomentations applied for 24 hrs., then paste daily	6	An instance of rapid healing
4	1+	Olive oil and flour	1½ hrs.	Scald	2nd degree, chest, shoulders, and neck	Gas-and-oxygen	Charcoal-silver nitrate jelly applied; removed on 10th day, since tan was moist and septic; acriflavine applied to one half of infected area, paste to the other. After 6 days the part with paste was healed, the part with acriflavine healthy but raw	22	Healing and antiseptic properties of the paste demonstrated
5	3−	Carron oil	1 hr.	,,	2nd degree, neck, chest, and shoulders	None	Cleansed; paste applied; reapplied every 3rd day	12	Satisfactory healing
6	1+	Tannic acid jelly	1 hr.	,,	2nd degree, pubis, vulva, thighs, left leg, and foot	Gas-and-oxygen	Cleansed; paste applied to foot; reapplied every 3rd day; other parts tanned	30	Foot healed by 16th day. Coagulum began to separate on 22nd day
7	5+	None	2 hrs.	Burn	3rd degree, dorsum, left hand	,,	Cleansed; paste applied; reapplied every 3rd day	Under treatment	Kept perfectly dry without any sign of local inflammation; on 13th day slight moisture apparent at edges; on 15th day the natural coagulum separated, leaving healthy granulating surface
8	4−	Tannic acid jelly	2 hrs.	,,	Extensive 1st, 2nd, and 3rd degree, involving ear, cheek, chin, neck, right forearm, left forearm, hands, and legs	,,	Intravenous plasma; cleansed; paste applied to face and left hand; other affected parts, including right hand, tanned	Under treatment	Left hand healed perfectly by 5th day; movements full; tan on right hand still adherent, with no sign of separation
9	34	None	4 hrs.	Scald	2nd degree, dorsum right foot	None	Cleansed; paste applied; reapplied every 3rd day	9	Almost healed by 6th day
10	11	Tannic acid jelly	28 hrs.	,,	2nd degree, right buttock	,,	Cleansed; paste applied; reapplied every 3rd day	8	Healed by 6th day
11	−1	,,	4 hrs.	Burn	2nd and 3rd degree, buttocks	Gas-and-oxygen	Cleansed, paste applied; reapplied every 3rd day	14	Very small area on right buttock still to heal on discharge; satisfactory healing considering age and site
12	1+	Olive oil	1+ hr.	Scald	2nd degree, left shoulder, arm, and chest	None	Cleansed; paste applied, reapplied daily	13	Some pain on application; a rather complicated case; scarlatiniform rash, etc.; 2 small areas still to heal on discharge
13	2+	,,	2− hrs.	,,	2nd degree, left side of face, scalp, and small area of chest	Gas-and-oxygen	Cleansed; paste applied; reapplied every 3rd day	12	Face healed by 5th day; very small area on chest still to heal on discharge
14	1−	?	17 hrs.	Burn	2nd degree, involving an area 4 in. in diameter over vertex of head and left auricle; 3rd degree of scalp just posterior to auricle penetrating to bone	,,	Cleansed; paste applied; reapplied daily	Under treatment	On 8th day all parts healed except area behind the ear
15	4+	Olive oil	1 hr.	Scald	Extensive 2nd degree, involving chest, abdomen, groins, thighs, left axilla, face, palm of left hand	,,	Intravenous plasma; cleansed, paste applied to left hand; other parts tanned	,,	Left hand healed by 9th day with full movement; no sign of separation of tan
16	7	None	1–2 hr.	,,	2nd degree, right forearm and both lower limbs	,,	Cleansed, tanned; coagulum removed on 10th day because of sepsis; paste then applied; reapplied every 2nd day	,,	Practically healed after 3 applications of paste
17	4	,,	1–2 hr.	,,	2nd degree, scalp and right shoulder	,,	Cleansed; tanned; coagulum over shoulder removed on 14th day because of sepsis; paste then applied; reapplied every 2nd day	,,	Practically healed after 3 applications of paste
18	3+	Tannic acid jelly	2½ hrs.	Burn	2nd degree, lower lip and under surface of lower jaw	None	Intravenous plasma; cleansed; paste applied; dressed every 2nd day	,,	Almost healed by 4th dressing
19	2+	Olive Oil	3½ hrs.	Scald	2nd degree, suprapubic area, penis, and scrotum. Very marked oedema	Gas-and-oxygen	Cleansed; paste applied as spread every 4 hours for 24 hours, then 3 times a day	,,	On day following admission oedema was distinctly less; by 6th day progress was rapid
20	19	Tannic acid jelly for 6 hrs., then saline compresses	1 wk.	Burn	2nd degree, right hand thenar eminence, palm, second and third finger clefts	None	Cleansed; blisters snipped and considerable dead skin removed; paste applied; reapplied every 2nd day	Out-patient	Healed within 7 days; movements free and full

flexion. All dead epidermis and inspissated discharge were now removed, the parts cleansed with normal saline, the paste applied, and the hand placed in the position of maximum function. After two applications pain was absent, movement of the fingers was free, and the raw areas had almost healed. Apart from illustrating the value of euglamide, the history of this patient demonstrates that saline treatment, like tanning, may lead to unsatisfactory results and thus to condemnation of the method.



FIGS. 1 and 2.—Photographs of hand (Case 20) seven days after being burnt. Treatment had been tannic jelly for six hours, then saline baths and compresses. Fig. 1, with extension of fingers; Fig. 2, attempted full flexion of fingers.



FIGS. 3 and 4.—Photographs of same hand after seven days' treatment with euglamide. Fig. 3, with fingers in extension; Fig. 4, with fingers in full flexion.

Discussion

It must be emphasized that this study is merely in its preliminary stages, as only a limited number of cases have been treated. Nevertheless the results obtained so far have been promising, and suggest that further work is desirable. The method was evolved in an attempt to solve the difficulties experienced in the treatment of burns of the hands and face and of those of third degree: most of the burns treated have been of the second degree, the type usually encountered in civil life. We have not had an opportunity of treating the many burns of the third degree met with in Service casualties. There is no suggestion that in extensive burns euglamide should be used as an alternative to tannic acid; it is well recognized that in such cases the application of a coagulating agent is essential to combat secondary shock. There are certain types of burns, however, in which euglamide treatment offers (so far as we can judge from our present experience) definite advantages as compared with other methods. This applies more especially to those lesions in the treatment of which the coagulating method has been adversely criticized; thus it is well known that all third-degree burns become infected, while second-degree burns in certain localities—e.g., hands and face—may show undesirable after-effects when treated with tannic acid. For these reasons the saline-bath method has recently been revived, but it would appear to have certain drawbacks. It involves considerable nursing attention and the employment of elaborate facilities; this in itself would make it very difficult to deal with more than a limited number of cases at any particular time. Moreover, the method does not control sepsis, though this could be done by the addition of albucid soluble to the irrigating fluid. In this connexion it is of interest to note that Carrel and his co-workers showed that the rate of healing of wounds is appreciably increased by the addition of certain antiseptics to the irrigating fluid (Carrel and Dehelly, 1918).

The euglamide method does not appear to possess the disadvantages associated with the tannic acid and saline techniques of treatment. It has proved effective in dealing with burns of the face and hands, allowing of rapid and uneventful recovery. Indeed, in two cases in which an accurate comparison with tannic acid was possible the rate of recovery with euglamide was very gratifying. This may have been due to the fact that, with euglamide, movement of the fingers was possible from the first and oedema was rapidly controlled.

In third-degree burns the results obtained in Case 7 would suggest that the paste allows of an early separation of slough, control of sepsis, and the development of healthy granulating surface for early skin-grafting.

Routine bacteriological examinations have been and are being made in all cases with a view to determining the possible effect of the paste on different types of infecting organisms. With the limited series of cases so far studied a discussion of the results would be premature. At the same time it is of interest to note that investigations performed by Dr. de Waal in the department of bacteriology of the University of Edinburgh have shown by means of *in vitro* experiments that albucid soluble exerts a bactericidal and bacteriostatic action against *Str. pyogenes* and also some bacteriostatic action against *B. coli*. (We are very grateful to Dr. de Waal for allowing us to quote these as yet unpublished results.)

It is possible that soluble sulphonamides other than albucid might be more suitable for the treatment of certain types of infected burns, and in our further work we hope to study the possible value of euglamide pastes containing these.

Summary

Euglamide paste has proved very useful in the treatment of burns in certain areas—e.g., hands, face, scalp, feet, abdomen, buttocks, scrotum, and penis.

In small second-degree burns the paste caused slight pain on application in a few cases; later on it is soothing, non-irritant, and healing. Preliminary cleansing can often be carried out without anaesthesia. The paste is simple to apply, and the patient has more freedom of movement than when a coagulating agent is used

Infected burns have also responded in a very satisfactory manner to treatment with the paste.

In one purely third-degree burn treated with euglamide a clean surface suitable for grafting was rapidly obtained.

Only a limited number of cases have so far been investigated; but in our opinion the results have been promising enough to justify further work.

We should like to express our gratitude to Profs. A. J. Clark and J. R. Learmonth for their constant interest and advice in this work.

We are greatly indebted to Mr. Edwards, of Schering Ltd., for the supply of the albucid soluble used in this work.

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DIGESTIVE DISORDERS IN THE FORCES

BY

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The types of cases seen in the wards and out-patient departments of military hospitals present general variations similar to those found in civil hospitals. Thus rheumatic and respiratory disorders have the usual seasonal fluctuations. On the other hand, conditions such as effort syndrome and general psychological disorders tend to increase temporarily with the periodic intake of recruits. But in our experience in a home hospital during the present war the only cases showing steady addition in numbers comparable to the increasing size of the Army have been those with digestive disorders, and in consequence we have been struck by their significance in the Forces. Our cases have been drawn from all branches—Navy, Army, Air Force, and Women's Auxiliary Services. However, Army patients have constituted an overwhelming majority. It was noted, over a period of fourteen months in a military hospital in a north-western area, that of 790 medical in-patients 246 (31.1%) were admitted on account of gastro-intestinal complaints; while in a north-eastern hospital it was found that of 980 medical admissions 353 (36%) were gastro-intestinal cases; but it must be borne in mind that these hospitals are used largely for the investigation of such cases, which are especially sent for this purpose, and consequently the percentage of gastro-intestinal conditions admitted is not a measure of their incidence in all hospitals. Nevertheless, gastric disorders are an important problem in the Services.

Methods of Investigation and Treatment

In a large north-western military hospital our procedure in assessing cases of gastro-intestinal disorder is to obtain an accurate case history, make a detailed clinical examination, and then undertake certain lines of special investigation. In what we may term the "gastric" group, which includes cases of gastritis in addition to those of peptic ulcer, tests for occult blood in the stool are performed after seventy-two to ninety-six hours on a haemoglobin and chlorophyll-free diet. This is followed in many instances by a fractional test meal. Finally an *x*-ray examination by barium meal is carried out in all save a very few cases concerning which positive findings are readily obtainable from recent investigation in civil life. Where the gall-bladder or large bowel appears to be implicated cholecystography or examination by barium enema is carried out.

With the gastric group the dietetic treatment as outlined by Hurst (1931) is employed with excellent results. By this method the modern dietetic principles in treating peptic ulcer are followed—that is, physical rest is combined with a well-balanced diet of an adequate caloric value and vitamin content.

Table I shows the proportions of major types of digestive disorder admitted to this military hospital, and their age incidence. At once it is seen that cases of peptic ulcer form the chief problem among the dyspepsias, accounting for actually 64.23% of such patients. No attempt has been made to study the incidence of dyspepsia in the various branches of the Forces or to examine sex incidence, since this would be of no value with the figures at our disposal. It was found that there were four main groups of digestive disorder: duodenal ulcer (54.88%), gastric ulcer (9.35%), gastritis (24.39%), and miscellaneous dyspepsias (11.38%). In this last group psychological disorders appeared to play a relatively unimportant part, and we were struck by the rarity of malingering. In our series there were no fatalities.

TABLE I.—*Age Incidence in Major Dyspepsias*

	Under 20	20–29	30–39	40–49	50+	Total Cases
Duodenal ulcer ..	3	52	49	27	4	135
Gastric ulcer, including one stomal ulcer	—	5	10	7	1	23
Gastritis	1	22	19	13	5	60

By the addition of 28 cases of miscellaneous dyspepsias a total is reached of 246 consecutive admissions on account of digestive disorders. There were 790 medical admissions in all during the fourteen-months period under review.

Duodenal Ulcer

Duodenal ulcer formed 85.5% of the cases of peptic ulcer—14 were in officers, the remainder in other ranks. There were no female cases. Perforation had occurred in civil life in 4 instances and in a fifth shortly after embodiment. In 8 patients gastro-enterostomy had been performed, and in 18 appendicectomy. There was a history of either haematemesis or melaena, or both, in 5 patients previously and in a similar number after entering the Forces. The average duration of symptoms was seven years, and only 5 patients (3.7% of the total cases of duodenal ulcer) stated that indigestion occurred first after embodiment. The stool was found to be positive for occult blood in 80% of cases. Fractional test meals were carried out in many instances (Table II). The results are in keeping with those usually found—namely, the majority of such cases show a well-marked hyperchlorhydria.

TABLE II.—*Test-meal Findings*

	Achlorhydria	Hypochlorhydria	Normal	Hyperchlorhydria	Total Cases
Duodenal ulcer ..	—	2	20	26	48
Gastric ulcer ..	1	3	3	1	8
Gastritis	11	15	17	12	55
Miscellaneous ..	1	4	6	1	12

A barium-meal examination was carried out and an ulcer niche or distortion of the duodenum was noted in all but one case, in which, although the *x*-ray findings were negative, an acute ulcer was diagnosed. (In this man an active ulcer had been noted at a previous examination in 1937; the stool was strongly positive for occult blood, and in addition a marked hyperchlorhydria was present.) Our well-marked positive findings can be explained on the fact noted above—that the average duration of symptoms in our series was seven years. Moreover, in over 96% of the cases exacerbation of a chronic ulcer was dealt with. Recrudescence of symptoms occurred rapidly after enlistment—in 70% within two months and in the remainder within eight months.

Gastric Ulcer

The cases of gastric ulcer numbered 23—14.6% of the peptic ulcer total. Fifteen had lesser-curvature ulcers, the remainder were prepyloric. There were 2 officers but no female cases. Two perforations occurred in this

group—1 before the war and 1 after. There was a history of haematemesis in 3 patients before enlistment, with recurrence in one instance two months after embodiment. In one man included in this group gastro-enterostomy had been performed on account of duodenal ulceration with subsequent development of a stomal ulcer. Appendicectomy had been previously undertaken in 2 patients.

With the exception of 4 patients (17.4%) there was a history of digestive trouble in civil life, the average duration of symptoms being five and a half years. The situation of the ulcer did not affect this last point. The stool was found to be positive for occult blood in 66% of the cases. The results obtained from fractional test meals, while too few to draw any general conclusion, show a rather lower acidity than in the duodenal group. This is explained by the greater irritation of the gastric ulcer, resulting in concomitant gastritis and consequent over-production of mucus (Hurst, 1935). A barium meal showed an ulcer niche in all but two instances. This examination was carried out within ten to fourteen days of admission to hospital, since it was of the highest importance to obtain radiological evidence of the presence of ulcer for purposes of the consequent medical boards. As has been noted by several observers (Hurst and Stewart, 1929; Hurst and Ryle, 1937), the ulcer niche in the gastric mucosa may with adequate treatment cease to be seen after three to four weeks. As with the cases of duodenal ulcer, relapse after embodiment occurred within periods varying from a few days to two months in the bulk of cases, but a few of these patients had remained well for periods up to seven months after enlistment.

Disposal of Cases of Peptic Ulcer

Where investigation had revealed the definite presence of peptic ulceration every patient was brought before a medical board. Apart from officers all these patients were found to be unfit for any form of military service with the exception of one man suffering from gastric ulcer who was passed as fit for home service only. Commissioned ranks, for reasons to be stated later, were dealt with differently. Of 14 officers with duodenal ulcers 5 were passed as fit for home service only, the others being returned to civil life. One of the 2 officers with gastric ulceration was graded as fit for home service only; the other was passed fit for general service.

In the last case there were symptoms of indigestion for some four months with loss of weight. This patient was admitted to another hospital, where laparotomy was performed. A mass noted as "either malignant or inflammatory" was observed in the posterior pyloric region, extending into the duodenum. Gastro-enterostomy was performed and the abdomen closed. He came under our care about four months afterwards, in excellent health, gaining in weight and symptomless. The stool was negative for occult blood. A fractional test meal gave normal findings, and on two occasions the barium-meal examination showed a normally filled stomach and a functioning stoma. The Kahn test was negative.

Gastritis

Sixty patients—almost 25% of the cases of dyspepsia and therefore an important moiety—were diagnosed as suffering from gastritis. Many of them gave a history of pain and vomiting after food that was so typical of peptic ulcer that the results of barium meals and fractional gastric analyses formed essential parts of the diagnostic criteria. We have adhered to the views of Hurst (1935) in assessing these cases, and the test-meal findings in Table II show that great variations in acidity occur in such conditions. Abundant mucus was present, especially in the fasting juice. The great majority (79%) suffered from exacerbation of a chronic gastritis, there being a history of indigestion of several years' duration (average seven years). The remainder gave no history of gastric trouble in civil life and were examples of acute gastritis due to alteration in diet following embodiment. There were four cases in commissioned ranks: the others occurred among N.C.O.s and men, with the addition of one in a member of the A.T.S.—our only female case. Thirty-one complained of symptoms arising rapidly after embodiment, and the remainder were able to carry on for periods up to one year. A weak positive result for faecal occult blood was obtained in 25% of all cases of gastritis.

Disposal of Patients with Gastritis

All save two patients in this series did well and were returned to their units, in some instances via a convalescent home. It was explained to these men that they did not suffer from any serious digestive ailment, such as a ulcer, and they were instructed to avoid particular "heavy" constituents in their Army diet. In one instance a man aged 49 was returned to civil life owing to absence of improvement (he had achlorhydria); a second was dealt with similarly on account of a concomitant hand injury which interfered with his duties and superadded a psychological element.

Miscellaneous Group

A *miscellaneous assortment of gastro-intestinal trouble* accounted for the remaining cases of dyspepsia and comprised only 11.38% (28 cases). They were made up as follows; abdominal adhesions, 6 cases; catarrhal jaundice, 5; chronic cholecystitis, 2; cirrhosis of liver, 1; duodenal diverticulum, 1; gastric carcinoma, 1; gastro-enteritis, 5; mucous colitis–spastic colon group, 6; and *one example of gastro-intestinal supersensitiveness.* In this series 4 cases were in females. Seven of these patients were returned to civil life, while 2 were found fit for home service only. The large proportion of these cases "boarded" out of the Army is not of real significance owing to the small total number involved.

The patient showing gastro-intestinal supersensitiveness is of interest. A gunner aged 44 was admitted with a history of haematemesis. He stated that he had seldom suffered from gastric symptoms in civil life, but since embodiment had been frequently seized with severe abdominal pain accompanied by vomiting. He blamed the midday meal. On admission, although the stool contained occult blood, he stated that he felt perfectly well and wished to return to his unit. A fractional test meal gave normal findings and a barium-meal examination did not reveal evidence of either gastric or duodenal ulcer. The stool was tested after another seven days and was negative. At this point he was placed on Hurst's diet for peptic ulcer, Stage 2, and on irregular occasions complained of severe epigastric pain and vomited after meals. It was suspected that in this instance we were dealing with an example of supersensitiveness to a particular food, and the offending article—carrot—was detected and eliminated from his meals, with rapid and complete cure. He then stated that he had always avoided this vegetable at home because he did not like it.

Summary of a Review of Digestive Disorders Seen in a North-Eastern Military Hospital

During the period April to October, 1940, it was found that of 980 medical cases in a north-eastern hospital 353 (36%) were admitted for radiological investigation on account of digestive complaints. In just over half the *x*-ray findings were negative. The majority of patients in this radiologically negative group suffered from gastritis, but 22% showed an anxiety neurosis of some form or another. Where there were positive *x*-ray findings duodenal ulcers were found to be nine times as common as gastric. Of the cases proved to

have ulcer 21 gave a history of operation for perforation: 23 had undergone gastro-enterostomy, and 21 gave a history of haematemesis (i.e., 15.8% of cases of proved ulcer). Of the 353 cases under review 56 had previously undergone appendicectomy. Of the cases examined by barium meals 54% were found unfit for further military service by medical boards. The mortality in the whole series was *nil*. Accordingly these results are *in substantial agreement* with those in the north-western hospital.

Discussion

The miscellaneous group of gastro-intestinal troubles, which make up only 11.38% of our series, consisting of hepatic and colonic disturbances, tumours, etc., have already been described. Nothing more need be written about them as the purpose of this paper is to draw attention to the problem presented by dyspepsia due to ulceration or gastritis.

There seems little doubt that digestive disturbances, particularly those due to peptic ulcer, have increased enormously during the past twenty years. This has been noted with concern in other countries, notably in the United States (Hinton, 1933; Wolfert, 1937; Rivers and Ferreira, 1938). The magnitude and importance of the increasing incidence of peptic ulcer have been brought sharply to the notice of the medical profession during the present war, and that condition has been shown to be the major cause of sickness among our Forces. Willcox (1940) found that in a British convoy from France which contained 174 medical sick 23.5% suffered from the dyspepsias. This group after investigation revealed the unexpected incidence of approximately 66% of peptic ulcer. Again, Morris (1940) noted that of 500 officers and men suffering from dyspepsia and examined radiologically in a military hospital 45% suffered from either duodenal or gastric ulcer, or both. Recently Payne and Newman (1940) carried out an important investigation into the subject of dyspepsia in the Army and found that, out of 287 cases, peptic ulcer was proved in 226 (78.7%), and to this they added a further 21 cases (7.3%) with probable ulcer. No significant difference was found on separating these cases into groups from the United Kingdom and France.

In our own series of 246 cases with gastro-intestinal complaints peptic ulcer was present in 64.23%, while cases of duodenal ulcer made up 85.5% of the latter. This significant fact was also noted by the authors quoted above. These patients, whether they suffered from duodenal or gastric ulcer, almost without exception were in the habit of carrying out a dietetic regime in civil life which approximated to the post-ulcer regime used at the present day, and with success so long as they adhered to it. This is a striking tribute to the efficacy of the medical treatment of peptic ulcer, since we find large numbers of patients pursuing their vocation efficiently and with little interruption. In this connexion it was pointed out by Colonel H. Letheby Tidy in his Harveian Oration (1936) that gastric ulcer is a more serious condition than duodenal ulcer, but he concluded that the outlook as regards complete cure was unfavourable in both.

The majority of those whose breakdown did not occur until some months after embodiment belonged to older age groups or found it possible to obtain suitable food. Such patients often stated that they purchased meals at the local canteen, especially the midday meal, trying to avoid stews, which they dreaded. Moreover, they were able to treat themselves with alkaline powders, usually of some much-advertised brand. Similarly, since a suitable diet was a less serious problem, commissioned ranks were sometimes able to carry on for periods up to a year before exacerbation of symptoms occurred. Officers could often carry on in comfort in France until active hostilities precluded suitable diet. In this connexion the severe physical strain and irregular meals before evacuation undoubtedly had an adverse effect. This was also noted in patients after the Norwegian campaign.

A feature in our cases is the general absence of severe complications. Thus in the duodenal ulcer group (135 patients) we find only one case of perforation, and only 5 cases (3.7%) of haematemesis occurring while serving with the Forces. During the period under review our surgical colleague Lieut.-Colonel E. G. Gerstenberg admitted 2 cases of perforation; in both a chronic ulcer of the anterior duodenal wall was found. In our gastric ulcer group there was but one instance of perforation after embodiment and one of haematemesis. On the other hand, Hurst and Ryle (1937) have stated that some 30% of ulcer patients in private practice show bleeding at one time or another. Graham, Alexander, and Kerr (1939) found over a ten-year period that approximately 57% of the cases of peptic ulcer in a civil hospital were admitted on account of active bleeding. Such marked discrepancy is probably accounted for by two factors: first, men with ulcer which is showing evidence of activity are unlikely to be passed as fit by the civil recruiting boards; and, secondly, sufferers go sick and receive treatment earlier in the Army than in civil life. The high proportion of ulcer cases with occult blood present in the stool suggests that, but for the discovery of this, gross bleeding might have become an important problem.

We were unable to obtain any convincing evidence of serious avitaminosis, nor was dental sepsis a more prominent feature in such cases than in other medical admissions.

In civil life many of these patients led a regular existence suited to their trouble. They seldom admitted that heavy smoking or alcohol played any part in their breakdown; indeed, we were struck by the number who stated that they were teetotal and never smoked more than ten cigarettes daily. Embodiment brought these men new problems—worry and the adjustment and strain of taking up a fresh mode of life and leaving their family or business. Altered conditions of living, lack of sleep, unsuitable billets, all affect such subjects adversely. Lastly, the Army diet is not suitable for persons who show the ulcer diathesis. The official decision to discharge men with active ulcers or with a history of long-standing severe gastric illness is of proved wisdom under the conditions of modern warfare.

Patients suffering from exacerbation of chronic gastritis, although they ascribed some improvement in their condition in civil life to the avoidance of fried food, stews, and pastries, did not as a class receive the same amount of benefit from a dietetic regime and were more introspective. As was found in the cases of peptic ulcer, and for similar reasons, the group who broke down several months after embodiment consisted mainly of the older men. It has been noted already that only 2 of the 60 patients in our series required to be discharged from the Service.

All cases of acute gastritis without previous history made a rapid recovery and the men returned to their units well. The cases of this type actually admitted to hospital are of course few, since the regimental medical officer is able in the vast majority of instances to deal with them himself. Thus it is seen, almost without exception, that men with gastritis, both chronic and recent, when given a fresh start and some general dietetic principles to go on, can safely be allowed to remain in the Army without alteration in category.

The high incidence of digestive disorders, particularly of duodenal ulcers, seen in the past two decades has been

thrown into sharp relief by the mobilization of our manpower for war. It would occasion little surprise if the quickening tempo of modern life were found to have a direct bearing on the problem presented by the increasing occurrence of the dyspepsias. No entirely convincing clue to this enigma has yet been offered, but it will be interesting to learn whether or not life in our Forces is adding significantly to the already high frequency of such disorders. Final judgment on this point must, of course, await the conclusion of the present conflict. We are in entire agreement with the leading article in the *British Medical Journal* of December 14, 1940, which stated that "the Army still marches on its stomach even though it travels in mechanized vehicles," and the dyspeptic passenger must be carefully scrutinized before taking part in the journey.

Summary and Conclusions

In Army medicine digestive disorders are presenting a large and increasing problem. Of 790 medical in-patients 246 (31.1%) were admitted to a military hospital on account of gastro-intestinal complaints.

The methods of investigation and treatment of dyspeptic patients in a large military hospital are outlined.

Of 246 cases of digestive disorder 135 (54.88%) were found to have duodenal ulcers, 23 (9.35%) had gastric ulcers, 60 (24.39%) gastritis, and 28 (11.30%) miscellaneous dyspepsias. Details are given of the clinical findings in these groups and of the ultimate disposal of the patients. A review of 353 similar cases admitted for radiological investigation to another military hospital yielded substantially similar results.

Many observers have shown that peptic ulcer is the major cause of sickness among the Forces. In our series 64.23% were proved to have peptic ulcer, cases with duodenal ulcers forming 85.4% of this group.

Complications such as haematemesis and perforation were conspicuous by their rarity.

In the vast majority of ulcer patients we were dealing with an exacerbation of an old-standing condition which was adequately dealt with in civil life by simple medical treatment, enabling the sufferer to continue as a useful member of the community. But the strain of Army life tends to induce recrudescence.

Patients with acute gastritis can often be adequately treated by their own medical officers, while men with either acute or chronic gastritis, if given a fresh start by a period of residence in hospital, generally do well and can safely be allowed to remain in the Army.

It is suggested that the quickening tempo of modern life is related to the increasing occurrence of the dyspepsias, especially peptic ulceration, and the question is raised whether or not Army life will add to the frequency of such disorders.

The point of highest military importance which emerges from this investigation is the large proportion of those with a definite history of peptic ulcer who on embodiment in the Army soon become a serious charge on the medical authorities.

Our grateful thanks are due to Colonel H. Letheby Tidy, also to Prof. C. H. Browning, for helpful advice and criticism; and to Colonel D. F. Mackenzie, D.S.O., A.M.S., Colonel R. A. Lennie, T.D., A.M.S., and Lieut.-Colonel A. M. Simson, R.A.M.C., for permission to carry out this work. We also wish to express our gratitude to the pathological and radiological staffs concerned and to those who have so loyally co-operated in the ward work.

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EXPERIENCES WITH SULPHANILAMIDE DERIVATIVES IN SOME TROPICAL CONDITIONS

BY

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A review by Buttle (1939) of the uses of sulphanilamide derivatives in tropical diseases prompts me to give my experiences with this drug not only in some purely tropical diseases, but also in some of world-wide distribution the clinical picture of which is influenced by the tropical background, and in the treatment of ordinary streptococcal invaders of pathological conditions essentially tropical in origin.

All the cases reviewed were treated in Trinidad, British West Indies, except where otherwise stated. The drugs used were sulphapyridine (M & B 693) and sulphanilamide (prontylin).

Diseases due to Filterable Viruses

(*a*) *Dengue.*—In a series of cases studied during an epidemic in Trinidad (Earle, 1939a) sulphapyridine had no apparent curative effect on the temperature, rash, or cervical gland enlargement (which is present in from 30 to 60% of cases—Castellani, 1939), arthralgia and myalgia, or state of malaise in the patient. Indeed, the epigastric pain and headache produced by the drug so exacerbated the patient's condition that its use had often to be abandoned. The danger of reducing the leucocytes in a condition in which there is already a leucopenia is a further disadvantage in the use of sulphapyridine.

Case 1.—A female English child aged 2, first seen on April 26, 1939, when she complained of generalized pain. Temperature 101° F.; a well-marked dengue rash was present. Sulphapyridine, 0.125 gramme (1/4 tablet) four-hourly, was given. An improvement was recorded on April 27, the temperature falling to 99° F.; but it subsequently rose again, giving the saddle-back type of curve (Megaw, 1937). Recovery was uninterrupted. Here, although at first sight it might be thought that the drug had had a curative effect, it was obvious that it had no influence on the course of the disease.

Case 2.—A female aged 17, English, seen on February 2, 1939, during the dengue epidemic, when she had generalized body pain, headache, and enlargement of the submaxillary and superficial cervical lymphatics. Temperature 103.8° F., pulse rate 126. A red flush over chest and face was seen. Sulphanilamide 2 grammes (4 tablets) was given at once, followed by 1 gramme four-hourly. The course was continued for five days. No alteration in the patient's condition occurred, and she took the usual time to recover.

Case 3.—A Scotsman aged 35, seen on February 12, 1939, when the usual clinical signs of dengue were apparent. 1 gramme of sulphapyridine was given four-hourly. The next day the pains had greatly increased and epigastric pain, nausea, and vomiting were present. The drug was suspended; the patient's condition improved after twenty-four hours, and he made an uninterrupted recovery.

(*b*) *Lymphopathia Venereum.*—The beneficial effects of sulphanilamide compounds in my practice have already been described (Earle, 1939b, 1939c, 1939d). Briefly, good results may be expected in early cases, before fistula formation. But even in later stages or when fistulae have formed some improvement may result. Lymphogranulomatous papillae of the vulva and rectum are reduced in size and indurated strictures of the rectum become softer and therefore amenable to dilatation.

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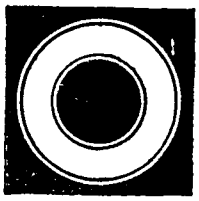
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Ulcerative Granuloma

The action of sulphanilamide alone on ulcerative granuloma, although favourably reported on by Ross (1939), has in my experience proved unsatisfactory. When combined with injections of fouadin (a complex salt of trivalent antimony with a pyrocatechin derivative) the results are much more encouraging (Earle, 1940–1). The treatment consists of a course of sulphapyridine, 3 grammes daily for five days, the course being repeated after an interval of three to four days. At the same time the standard course of fouadin, injected intramuscularly, is given. (Initial dose 1.5 c.cm., rising to 5 c.cm.; total dosage, 75 c.cm.) The injections are made every second day.

Tropical Pyomyositis

The action of sulphanilamide in this condition has already been described (Earle, 1939e). The standard dosage of the drug may be given, and good results are to be expected.

Tropical Ulcer

(*a*) *Typical Tropical Ulcer.*—Sulphanilamide is of value only in very early ulcers or pre-ulcerative papules of the idiopathic type (Earle, 1940a). It is of very limited value in old-standing ulcers.

(*b*) *Tropical Ulcer Associated with Popliteal Abscess.*—I group separately the case described below, as I have only once seen tropical ulcer associated with popliteal abscess in all the cases of this ulcer I have studied in Trinidad. This type of case is common among Chinese coolies at Ocean Island (Central Pacific) and among native Nauruans at Nauru. Possibly this form of tropical ulcer differs from the ordinary tropical ulcer in aetiology.

Case 4.—A male negro aged 14, first seen on June 22, 1939, when examination showed a tropical ulcer of the left foot associated with a popliteal abscess of the same side. Sulphapyridine, 2 grammes daily for five days, was given. On June 30 the popliteal abscess was almost healed: the course of sulphapyridine was repeated, and on July 11 both abscess and ulcer had healed. (Cod-liver oil was used as a local application in this case.)

Streptococcal Infection Implanted on to Fungous Diseases

In the Tropics certain fungous diseases appear to be readily infected by streptococci.

(*a*) *Intertriginous Ringworm.*—The infection caused by *Trichophyton* (*Epidermophyton*) *interdigitale* often leads to severe cellulitis or severe ulceration or maceration of the feet, due to a secondary streptococcal infection. I have found it advantageous to clear up the secondary infection with sulphanilamide before proceeding to a radical cure of the fungous condition.

Case 5.—A Chinese clerk aged 30, first seen on January 10, 1939, when he complained of pain and swelling of the left foot. On examination there was a well-marked ringworm of all the interdigital clefts, with cellulitis involving the whole foot. Sulphapyridine, 3 grammes daily for six days, was given, and magnesium sulphate and glycerin were applied to the open lesions. On January 19 the cellulitis had cleared up, and local treatment (Castellani's fuchsin paint) could be started.

Case 6.—An English storekeeper aged 40, seen on December 3, 1939, when he complained of severe ulceration of the interdigital clefts and soles of both feet, this condition supervening on "athlete's foot." Sulphapyridine, 4 grammes daily for four days, was given. The course was repeated twice, two-day intervals separating the courses. At the end of these courses the secondary infection had healed sufficiently for the fungous condition to be treated by x-ray therapy.

(*b*) *Fungous Infection of the External Ear.*—"Tropical ear," or "salt-water ear," appears to be an invasion of the external auditory meatus by the Pityrosporon of Malassez, secondarily invaded by streptococci and staphylococci. If untreated, crops of painful furuncles may occur. I found it a useful precaution to give sulphanilamide in incipient "tropical ear" and also in later cases in which furuncles had already formed. In five cases, all in young children, sulphapyridine given in an appropriate dose at the first sign of soreness following sea-bathing prevented the onset of complications. In a sixth case multiple small abscesses supervening in an infected ear were cured in three days.

Complications of Yaws

One case of severe secondarily infected yaws favourably influenced by sulphapyridine is worthy of record.

Case 7.—A negro boy aged 3, found on May 23, 1939, to be suffering from infected and ulcerative yaws of legs. Sulphapyridine, 1 gramme daily for three days, together with bismuth injection, was given. On June 1 the gross secondary infection had cleared up. Bismuth injections were continued and neosalvarsan injections were added to the treatment.

Lymphangitis

(*a*) *Non-filarial.*—Lymphangitis of obscure origin is seen in Trinidad. It is not necessarily filarial, since filaria is rare in that island (see Health Reports of Trinidad and Tobago for the years 1937 and 1938). A typical example of non-filarial lymphangitis is appended.

Case 8.—A white Trinidadian overseer aged 48, seen on March 15, 1940, when he complained of fever, and pain and swelling of the right leg. He gave a history of a shrapnel wound in the right thigh during the 1914–18 war. Since his demobilization and return to Trinidad he had had recurring attacks of lymphangitis in the affected extremity, these being at times combined with erysipelas-like attacks. The temperature was 102° F., pulse rate 96. The right thigh and calf were swollen and painful. Irregular red areas, somewhat like erysipelas patches, were scattered over the skin of the calf. Thickened, red, inflamed lymphatics were seen in the thigh, and the crural lymph glands were swollen and tender. About four inches distal to Poupart's ligament there was a deep irregular scar, which caused great distortion of the adjacent tissues. The whole extremity was extremely tender. *Plasmodium vivax* but no microfilariae were found in the blood films. Sulphapyridine, 4 grammes daily (together with atebrin, 3 tablets daily), was given, and the fever and leg infection subsided in five days.

(*b*) *Filarial.*—In this condition—filarial lymphangitis—I have recently seen very favourable responses to sulphapyridine therapy in native Nauruans. As pointed out by Buttle (1939), this beneficial action is probably due to a curative effect on secondary streptococcal invaders.

Venomous Marine Animals

(*a*) *Portuguese Man-of-war* (*Physalia pelagica*).—Stings of this animal may, in my experience, give rise to severe ulceration and necrosis of the affected parts. Cellulitis and ulceration due to secondary infection may respond to sulphanilamide, and I therefore consider it a wise precaution to give the drug prophylactically in all these stings.

Case 9.—A white Trinidadian aged 21, seen on November 2, 1939, immediately after leaving the sea. The chest, abdomen, back, and arms were covered with scores of lesions from the tentacles of a Portuguese man-of-war. Sulphapyridine, 2 grammes, was given at once, followed by 1 gramme four-hourly for two days. No complications occurred.

Case 10.—A Chinese aged 23, seen on July 6, 1939, when he displayed severe cellulitis of the right forearm following a sting by a Portuguese man-of-war. Sulphapyridine, 4 grammes daily, was given. Recovery occurred within a week.

(*b*) *Sea-urchins.*—Spines of the white sea-urchin (*Tripneustes esculentus*), known in Barbados as the "sea-egg," may give rise to suppuration if not completely

removed. The use of sulphapyridine in such cases has already been described (Earle, 1940b).

(*c*) *Catfish.*—The spines of the catfish of Trinidad may produce localized cellulitis, ulceration, or gangrene. Sulphanilamide should be given prophylactically if possible.

Case 11.—A negro aged 14, seen on January 7, 1939, when he showed a cellulitis of the right hand due to a prick from a catfish spine. He was given sulphapyridine, 3 grammes daily, for two days. Cure was reported on January 9.

(*d*) *Barracouda.*—Bites from this fish often suppurate, and should receive prompt sulphanilamide therapy.

Case 12.—A Venezuelan aged 40, seen on January 8, 1939, when he displayed an infected barracouda bite of three days' duration. The area bitten was surrounded by a zone of ulceration and cellulitis. Sulphanilamide, 1 gramme thrice daily, was given, and the wound was dressed with magnesium sulphate and glycerin. On January 11 marked improvement was noted, and cure was complete on January 18.

Venomous Arthropoda

(*a*) *Insecta.*—(i) Chigoe Disease.—Ulceration and cellulitis surrounding the gravid female chigoe (*Tunga penetrans*) may respond to sulphanilamide therapy. I have seen three such cases react satisfactorily in this manner. (ii) Culicoides Bites.—Prophylactic treatment of bites of various Culicoides—*C. amazonius, C. furens, C. stellifer,* and *C. diabolicus* (Myers, 1935; Adamson, 1939)—which in Trinidad may be the starting-point of a tropical ulcer, has already been described (Earle, 1940a).

(*b*) *Arachnida.*—Several cases of encrusted scabies (gale norvégienne) have responded well to sulphanilamide therapy combined with local treatment with mitigal (dimethyl-diphenylene disulphide).

Case 13.—An East Indian labourer aged 20, seen on March 10, 1940, when he had encrusted and septic scabies of the palms, abdomen, penis, and scrotum. Sulphapyridine, 3 grammes daily, together with mitigal locally, was given. Cured in ten days.

(*c*) *Myriapoda.*—Severe cellulitis and ulceration which may follow bites of the centipede (? *Scolopendra gigantea*) have been controlled by sulphanilamide. Four successful cases have been noted, of which one is here described.

Case 14.—A negro labourer aged 30, seen on January 17, 1940, with severe cellulitis of the left hand following a centipede bite on the previous day. He was given sulphanilamide, 1 gramme thrice daily. The infection subsided in four days.

Beriberi

Bearing in mind the possible association of a bacterial exotoxin with vitamin B_1 deficiency in the production of beriberi (Low, 1936; Joyeux and Sicé, 1937), I tried the effect of sulphanilamide in a case of B_1 avitaminosis associated with cardiac lesions and oedema of the feet.

Case 15.—A female East Indian aged 25, first seen on January 4, 1939, when she complained of tingling and loss of sensation in the legs and feet, swelling of the feet, dyspnoea on slight exertion, and general weakness. The date of onset of the disease was uncertain. Examination showed a poorly built woman. The lips and conjunctivae were pale, teeth carious, and tongue furred. Firm oedema of both feet, dilatation of the right heart, and systolic murmurs were present. Pulse rate 96, tension low. Sensation of light touch was impaired in both feet and calves. Ankle-jerks were sluggish, knee-jerks were present. Ankylostome ova were observed in the stools. No malarial parasites were found in the blood. Anti-hookworm treatment was started at once. Vitamin B_1, 5,000 units daily, was injected intramuscularly for a week, and sulphanilamide was given orally for five days. On January 7 the patient had less dyspnoea and less oedema of the feet. A second course of sulphanilamide was given after three days' interval and vitamin B_1 every second day. The patient made an uninterrupted recovery.

It is of course useless to draw any conclusions from an isolated case history. However, in cases of infantile beriberi seen recently in the island of Nauru—the patients sometimes being desperately ill, showing head retraction, spasticity of the limbs, Kernig's sign, and mental confusion, in addition to liver enlargement and hydrocele—dramatic results often followed lumbar puncture and intrathecal and intramuscular injection of large doses of vitamin B_1 combined with sulphapyridine by mouth. The vitamin used alone appeared to produce far less satisfactory results. Confirmatory work is obviously necessary in this obscure condition.

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LABORATORY INFECTION WITH BRUCELLA ABORTUS

BY

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The report by Huddleson and Munger (1940) of an epidemic of brucellosis in Michigan State College due to laboratory infection with *Brucella melitensis* raises in a dramatic way the problem of dissemination and the possible portals of infection in man of the pathogenic *Brucella* group.

Three Recent Cases

In this connexion the experience in my laboratory is perhaps worth recording, although in this case infection was due to the less virulent *Br. abortus*. Case 1 (H. N. G.) arose two years after experimental work had been in progress with a strain of *Br. abortus* originally isolated from a human case of undulant fever. The organism, after primary isolation in liver broth in an atmosphere of 10% CO_2, had been subcultured on plain media (agar or glycerin-agar) almost daily throughout this period, without any animal passage, and latterly grew rather better in air than in 10% CO_2. Careful precautions against accidental infection were taken, and the only direct exposure was in making frequent colonial counts from open agar plates, and in preparing and diluting small volumes of bacterial emulsions in saline from agar slopes. The attack of undulant fever did not arise after any unusual procedure or undue exposure, or after any known accidental contamination of the skin or laboratory benches. It followed a severe course, and though a trial of most of the therapeutic measures described was made, it subsided naturally after three months, immediately following the most severe pyrexial period of the illness. Sulphanilamide treatment was not, however, adequately carried out owing to sensitivity to the drug, which on one occasion produced an almost complete amblyopia lasting several hours. In the fourth week of convalescence a severe and protracted "myositis" of the lumbar muscles arose. There was no pyrexia, and the lesion was possibly allergic in nature.

Work was restarted with the same strain of organism two months after recovery, with more stringent precau-

tions than before, particularly with regard to sterilization of the benches after contact with glassware containing *Br. abortus* cultures, hand and arm ablutions, and general alertness as to the risk of infection. Gloves were worn, possible contamination by splashing was rigorously guarded against, and the bench was covered with izal for twenty-four hours after each session. Nevertheless a further case arose in the senior laboratory assistant, eleven months after the onset of the first case (i.e., after subculture of the strain for three years). This person was exposed to the organism only in the periodic preparation, from Roux bottles, of culture washings, which were poured slowly through a very wide glass funnel into an Erlenmeyer flask. At the time of infection a sulphanilamide-resistant strain which had developed from the stock strain after culture in sulphanilamide broth (Green, 1940) was being grown in bulk in Roux bottles. It is of interest that the strain of *Br. abortus* obtained from a blood culture previous to sulphapyridine treatment still retained about the same degree of resistance to sulphanilamide as the original infecting strain. This case ran a less severe course than the first, but did not become apyrexial for three months, though there was no serious relapse after giving an intensive course of sulphapyridine one month after the development of clinical symptoms.

The third case was that of another laboratory assistant, whose illness started one month after that of Case 2. He had assisted Case 2 in preparing the washings from the Roux bottles, but had not been near a culture of *Br. abortus* for one month, as all work with this organism was completely suspended and the preparation room was cleaned and disinfected when Case 2 was diagnosed. He also had a typical, fairly severe attack of undulant fever, which subsided naturally after about four months' illness.

Possible Source of Infection

There was, of course, nothing in the nature of an epidemic infection, and infection in every case may have occurred through some recognized channel such as a skin abrasion, droplet infection, or from contaminated fingers to the mouth. In all three cases, however, the individuals were not aware of any such contamination, and the second and third patients (in whom a great degree of caution had been induced by the occurrence and history of the first case) were certain that such contamination did not occur. Undoubtedly close contact with cultures was necessary for infection, as no case occurred in other members of the laboratory staff who were not working with the organism, whilst one member had assisted in the work for over two years without being clinically infected, though his serum agglutinated at one time at a titre of 1 in 100.

It is suggested as a possibility (without any concrete evidence) that infection was due to inhalation of contaminated air in the vicinity of large concentrations of *Br. abortus* growing on solid media. It is conceivable that, where the cultures had become rather dry, air currents (induced by Bunsen burners, etc.) could dislodge organisms from surface cultures. It should be noted also that Cases 2 and 3 were infected by a sulphanilamide-resistant strain. A large proportion of the cultures to which Case 1 was exposed were also grown in and subcultured from media containing sulphanilamide. It is therefore possible that after exposure to sulphanilamide the organism had become more virulent or invasive than the stock strain.

Commentary

This record does not supplement our knowledge of the alternative paths of infection in man by the pathogenic *Brucella* group, which in the natural infection is commonly via the alimentary tract. It is published rather as a warning that *Br. abortus* under laboratory conditions is a potentially highly dangerous organism and that the conditions governing its infectivity are still not completely understood. It is of particular interest that in Case 3 clinical symptoms did not appear until one month after any possible direct exposure to *Br. abortus* cultures, which would fix the incubation period in this case at a minimum of one month.

The cause of the outbreak of *Br. melitensis* infection occurring at Michigan appears superficially much more mysterious than that described here, nor do the present observations throw any light on it, except to add some support to the possibility of air-borne infection. They do, however, indicate that there may be another quite unrecognized mode of infection, the nature of which, from both the academic and the practical standpoints, it would be of value to know. Progress might be made if the details of laboratory infection of all types were more often reported.

Summary

Three cases of undulant fever are reported, due to laboratory infection by a stock strain of *Br. abortus* which had been continuously subcultured for two to three years.

In two cases the infecting strain was known to be sulphanilamide-resistant.

In no case was the exact site of entry of the organism established, and it is suggested that air-borne infection from surface cultures is a possibility.

A grateful acknowledgment is due to Prof. E. J. Wayne, who undertook the medical care of two of the cases.

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A CONVULSION DURING NON-CONVULSIVE FARADIC SHOCK THERAPY

BY

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Following on the promising results obtained by Berkwitz (1940) of Minneapolis, an investigation is being carried out on the therapeutic effect of non-convulsive faradic shock treatment in mental disease. This method is reputed to give as good results as the ordinary cardiazol or electrical convulsive therapy without the dangers consequent on the convulsions—namely, fractures of vertebrae, lesions of the brain, and abscesses of the lung—reports of which are becoming ever more frequent (Polatin and others, 1939; Bennett and Fitzpatrick, 1939; Hamsa and Bennett, 1939; Blair, 1940).

The apparatus and technique used are very similar to those employed by Berkwitz. The faradic current is produced by an ordinary induction coil such as is used in most massage departments for muscle stimulation; and this is driven by a 6-volt dry battery. The electrodes are applied to the patient's temples, the current is switched full on, and then fifteen shocks of half a second's duration are given at intervals of half a second, varying the on–off key of the coil to make and break the current. During this period the patient is fully conscious. Each shock produces a spasmodic contraction of the muscles of the face and neck, and is described as feeling "like a bang on the head." Immediately after the series of shocks a 5% solution of pentothal sodium is injected intravenously. Enough is injected to produce a surgical anaesthesia lasting 5 to 10 minutes, and while the patient is coming round he is in an ideal state for psychotherapy. Apparently the faradic shock shakes him up and establishes

rapport, and the barbiturate produces a state of increased suggestibility. Intensive psychotherapy in the form of general and specific suggestion and persuasion is carried out in every case.

The results so far obtained are promising, but sufficient cases have not yet been treated to allow of a statistical evaluation of the efficacy of the method. It is, however, considered advisable to publish the following case at this stage as an illustration that this treatment is not entirely free from risks. Also it shows the occurrence of a hitherto undescribed sensitization to the faradic current, as a result of which a major convulsion was produced by a potential only a fiftieth of the strength of that used in normal electric convulsive therapy (Berkwitz, 1940).

Case Report

A married man aged 30, a metal-spinner, was admitted to the Winson Green Mental Hospital on August 21, 1940, as a case of acute mania, following on various environmental difficulties. There was no personal or family history of epilepsy or mental disorder. He was elated, overactive, and euphoric. He showed a well-marked "flight of ideas" and had visual and auditory hallucinations. He was disorientated for time and place, and was completely devoid of insight into his condition.

Three weeks in hospital caused no appreciable change in his condition. On September 2 a course of prolonged narcosis was started, but on its completion he appeared much the same. On September 24 some carious teeth were extracted, and on November 18 tonsillectomy was performed. By that time he had become a little quieter, but there was no significant improvement. He was still excited, disorientated, and acutely hallucinated. On January 11, 1941, a course of faradic shock therapy was started. Treatment was carried out once daily for six days. An immediate improvement was noted. After the second treatment he was much quieter and became correctly orientated. After the third session he was allowed up out of bed. After the fourth session he started to do some light ward work and his hallucinations had disappeared. The same strength of current was used every day, but it was noticed that as his mental condition improved the effect of the shocks seemed to increase. He became apprehensive of the treatment, but since he was now fairly rational it was easy to persuade him to continue.

On the fifth day the shocks had a very marked effect, and he screamed and struggled each time the current was switched on. When he recovered he seemed almost normal and discussed the various factors which had led to his breakdown. He described his illness as having been like a dream and his hallucinations as having been excessive imagination. On the sixth day he was very apprehensive, and so it was decided to cut down the current to three-quarters of the usual dose. But despite this his reaction to the shocks seemed greater than ever, and after twelve shocks he went into a convulsion which resembled in every way that usually produced by azoman or cardiazol. It consisted of a tonic stage followed by a well-marked clonic stage, the whole lasting two minutes. During this time he became pulseless and very cyanosed, his face eventually going quite black. At the end of the fit an intravenous injection of pentothal sodium was given as usual, and he woke up twenty-three minutes later with complete amnesia for the actual period of treatment.

Subsequently he has appeared quiet and rational and has discussed his illness at great length with perfect insight; but he has complained bitterly of pain and tenderness in his upper dorsal vertebrae. He says he feels as though he has been "kicked in the back." A radiograph showed no abnormality.

In view of his satisfactory mental condition and the possibility of further convulsions producing crush fractures of the vertebrae it was decided to terminate the treatment at this stage.

Discussion

Berkwitz (1940) has shown that the resistance of the patient's head between the two electrodes is fairly constant at 10,000 ohms and that the average current flowing during a shock is about 10 mA. A much higher current than this is often used clinically in muscle and nerve stimulation without producing tissue damage, so the chief benefit claimed for faradic shock treatment is its safety, in that the current used is too small to produce burns or unconsciousness or convulsions.

The therapeutic efficacy of the treatment in the above case is undoubted. A bad case of acute mania which had resisted other forms of non-convulsive therapy was brought back to normality within six days; but with increasing normality came a strange increase in sensitivity to the faradic current, and finally a major convulsion, with all its dangers, was caused by a current three-quarters of the normal strength—a current which other patients can tolerate with equanimity. It would appear as though some cumulative physical change which was associated with the improvement of his mental condition was taking place in the patient's brain, and that this change also involved his sensitivity to faradic stimulation.

Further investigation along these lines may well lead to some satisfactory explanation of the mode of action of shock and convulsive therapy in mental disorder.

Summary

A brief account is given of faradic shock therapy. The reason for its preference to other forms of similar therapy is that it normally does not give any dangerous convulsions.

A case of acute mania successfully treated by this method is described.

An account is given of how the patient became increasingly sensitized to the faradic current until eventually a small current produced a major convulsion.

My thanks are due to Dr. J. J. O'Reilly, medical superintendent of Winson Green Mental Hospital, for his help and for permission to publish an account of this case.

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Clinical Memoranda

Convulsions under Anaesthesia

As the subject of ether convulsions has been much to the fore of late, and there is little agreement among writers as to the pathology or treatment of this grave condition, it may be of some value to record the first case of this kind that has occurred under my care.

CASE REPORT

The patient, a weedy boy aged 12, was admitted to hospital extremely ill with acute appendicitis of three days' standing. He appeared severely toxic; the temperature was 100°, the pulse 124, and he had marked right-sided abdominal rigidity. Cardiac examination showed *gross dilatation of the heart to the anterior axillary line*, associated with a soft systolic murmur all over the praecordium. This appeared to be the result of rheumatic carditis, possibly following a severe attack of measles at the age of 6.

Premedication consisted of atropine sulphate, 1/100 grain; and owing to his extremely poor general condition an intravenous glucose-saline drip was started before operation and was continued. Anaesthesia was quietly induced with 5 c.cm. of ethyl chloride and maintained by open ether on a lint-covered mask, covered again by lint and towel. Oxygen was administered under the mask continuously, and at no time was there any sign of cyanosis or hyperoxygenation. The anaesthesia

was maintained at the level of the second plane of the third stage, and no difficulties arose during the first hour.

Owing to the situation of the appendix and its condition, and that of the abdominal contents, the operation proved difficult and prolonged; the pulse became gradually more rapid until at the end of an hour it was over 200 and almost uncountable. Suddenly at this stage convulsions started in the right leg, immediately becoming general, rapid, and violent. While evipan was being prepared I removed the extra coverings from the mask and administered a few drops of chloroform, without any change occurring in the convulsions. I then removed the mask and ran in oxygen through the airway. With some difficulty, owing to the convulsions, I succeeded in introducing 2 c.cm. of evipan into an arm vein. Cessation of the convulsions was immediate and dramatic. I then introduced into the drip-tube a further 3 c.cm. of evipan, and as the pulse was very poor I also added to the drip-bottle 2.5 c.cm. of coramine. The patient's condition improved rapidly; the pulse fell to 184, and the operation was proceeded with, being completed at the end of two hours. Oxygen administration had been continued, and only a few occasional drops of ether on the mask were required to maintain a sufficient depth of anaesthesia. The patient returned to bed a good colour, with a pulse of 180.

This case is of further interest in that half an hour after his return to the ward a further convulsion supervened. This was a single tonic spasm of the whole body, with face florid, tongue protruding, eyeballs turned up, and head retracted. The pulse was imperceptible. Oxygen was administered through a nasal catheter, and in about a minute the convulsion passed off: the pulse returned and improved quickly, and had settled down to 144 in fifteen minutes. The intravenous drip was continued and 1/6 grain of morphine was given hypodermically, and the patient settled down to a perfectly peaceful return to consciousness. Next morning (twelve hours later) his pulse was 124 and the temperature 100°, and there was amazing clinical improvement. No post-anaesthetic complications ensued beyond slight chestiness, which quickly cleared up.

Of all the possible causes of convulsions that have been suggested the outstanding features in this case appeared to be (1) toxaemia; (2) cardiac defect and poor general condition; (3) prolonged operation. As to the cause of the second convulsion, I should be glad of any suggestions that might elucidate its cause and nature, and would like to be informed whether in cases of this type the preliminary administration of an intravenous barbiturate or even a suitable dose of one of the slower-acting barbiturates might have been an effective preventive measure.

Altrincham. H. A. LOGAN, M.B., B.Ch., B.A.O.

An Unusual Case of Cystic Disease of the Pancreas

The following case seems to be uncommon enough to merit being placed on record.

CASE REPORT

At 11 a.m. on March 7, 1940, I was called in to see a Hindu boy aged 11, a relative of one of our compounders living in hospital premises. He complained of intermittent pain in the abdomen and of an oval lump, about half the size of his head, extending downwards from the right costal margin. He had vomited twice. The lump was tender, dull to percussion, tense, and slightly movable, and its relations and attachments were uncertain. It was clearly defined to the right, but less so to the left, and it was possible to insert the fingers between it and the liver. The rest of the abdomen was not tender or "boarded." The pain, though fairly severe when present, was not sufficient to double him up. His temperature was 100°, rising later to 101.4°, and his pulse 120, rising later to 140. He had been all right after his evening meal the day before, but during the night vague abdominal pain had set in, disturbing his sleep from time to time. In the morning his father had discovered the lump in his abdomen, which apparently had not been there before. There was a history of worms having been passed some time previously.

On examination the faeces contained no ascaris ova, and the urine was normal. The leucocyte count was 20,000 per c.mm. Nothing abnormal was found per rectum. A radiograph was blurred owing to the child's inability to hold his breath, but it showed an opaque shadow at the site of the lump.

The differential diagnosis seemed to be between (1) obstruction due to intussusception, impaction of a mass of ascarides, or internal strangulation, and (2) retrocaecal appendix abscess; none of these, however, appeared to fit the clinical condition accurately. We gave the child an anaesthetic (ethyl chloride) and washed out his stomach and bowels, examining him again while under the anaesthetic, without affording him any relief and without eliciting any further information.

As his condition was getting worse—pulse, temperature, and respirations rising, and distress increasing—I operated at 8.30 p.m. A free right paramedian incision gave insufficient access to explore the lump adequately, but it was definitely located behind the ascending colon, which it had been compressing against the anterior abdominal wall. The bowels, appendix, and gall-bladder were healthy, and there was no free fluid in the peritoneal cavity and no apparent cause of the symptoms of obstruction except the pressure of the lump against the ascending colon and duodenum.

The lump itself was obviously cystic, and at first sight suggested the possibility of hydronephrosis, but it was found definitely not to be associated with the kidney. It was made up of innumerable loculated thin-walled cysts. I aspirated two of these from a point lateral to the ascending colon. One contained altered blood and necrotic material and probably bile, and the other contained clear fluid slightly stained with fresh blood. This aspiration reduced the size of the mass sufficiently for a better exploration, whereupon it became clear that the tumour was associated with the head of the pancreas and had worked its way retroperitoneally behind the ascending colon and still further to the right. The peritoneum covering the pancreas had an unhealthy "sago-pudding" appearance.

The patient's condition by this time was bad, and it seemed impossible to dissect out the cystic mass in time, so I decided to aspirate as many of the cysts as I could reach from the right side of the ascending colon, and trust to Providence for the result. The cysts varied in size from a pea to an egg. Some contained clear fluid. Others were blood-tinged or were full of altered blood, bile, and necrotic material. By the time I had aspirated as many cysts as I could reach the head of the pancreas had become, as it were, deflated. I inserted a drain in the right loin and closed the wound. Several injections of soluseptasine were given as a protection against possible suppuration, as well as anti-shock treatment.

I expected the patient to die, but actually he had no more trouble than could be expected from the trauma of the operation itself. The discharge from the drain ceased on the second day. His temperature, pulse, and respirations were normal from the third day, and thereafter he made an uneventful recovery, and when I last saw him on May 2 he was remarkably well. He had no discomfort, and no sign of the tumour could be made out.

COMMENTARY

I suggest, as the most probable explanation of the case, that haemorrhage and inflammation occurred in the head of the pancreas, which was already the seat of cystic disease—cystic adenoma. The cystic mass probably grew in size, working its way over to the right and displacing the peritoneum covering the duodenum, thereby causing pressure on the duodenum and pressure-obstruction to the outflow of bile and pancreatic juice from the common bile duct and so damming them back into the pancreas. This would cause digestion and haemorrhage. It also explains the presence of bile in some of the cysts, and the sudden increase in the size of the tumour clinically noted. The case, however, seems so unusual that I would be most interested if some expert surgical pathologist would comment on it.

I am obliged to Dr. Dyson, chief medical officer of the M. & S.M. Railway, for permission to publish the case, and to my Indian medical staff for their part in dealing with it and discussing it with me.

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Reviews

DIAGNOSTIC BACTERIOLOGY

Methods for Diagnostic Bacteriology: A Complete Guide for the Isolation and Identification of Pathogenic Bacteria for Medical Bacteriology Laboratories. By Isabelle G. Schaub, A.B., and M. Kathleen Foley, A.B. (Pp. 314. 15s. net.) London: Henry Kimpton. 1940.

This is a new kind of book. It sets out simply to describe the methods employed at the Johns Hopkins Hospital, Baltimore, for identifying bacteria in material from patients, and the fact that this exposition occupies over three hundred pages is due to leaving every left-hand page blank for the user's own notes and to the thoroughness with which the authors' task has been carried out. They begin by describing the methods employed for each kind of specimen, and follow this with instructions for identifying main types of bacteria. A section on serological diagnosis deals only with agglutination and precipitin tests, and gives particular attention to determining the type of pneumococci in various materials. A concluding section describes the preparation of culture media, stains, and other reagents.

Probably no two institutions use quite the same methods in this kind of work, and every bacteriologist has his foibles in technique: his methods may in some points be intrinsically superior to other people's or merely better for him because he is better practised in them. Hence no one is likely to admit that each of the proceedings described here is the best of its kind. Points in this book most likely to be criticized are the omission of bile or bile salts from media for cultivating typhoid bacilli from blood, the use of methylene-blue for staining diphtheria bacilli (it is impossible to dispute that Pugh's or Albert's stain gives a much more characteristic picture); a method for "washing" sputum which does not wash it at all but only employs rather cumbrous means to make a saline suspension of the whole specimen; the use of the wire loop as a spreader (many people find a bent glass rod much more serviceable); a hanging-drop technique which does not seal the preparation and therefore removes its chief advantage, which is that it can be incubated; and the absence of any reference to degrees of agglutinability in bacterial suspensions and their standardization. A more general criticism is that cultural methods advocated are too complex: there are shorter roads to the same results, and intelligent forethought or the study of direct films should enable the bacteriologist to use a single culture medium instead of three, as sometimes advocated here. On the other hand, almost everyone has probably something to learn from this book; it is of great interest as revealing the methods employed in a leading laboratory in the U.S.A., and its unique form renders it a ready source of information in difficulties which arise almost daily at the laboratory bench.

THE LIFE OF AN INVALID

The Glorious Bondage of Illness. By France Pastorelli. A translation of *Servitude et Grandeur de la Maladie.* Preface by Pierre Sanson, O.P. (Pp. 224. 2s. 6d. cheap edition.) London: George Allen and Unwin, Ltd. 1941.

The tragic nature of this book is enhanced by representing a partial failure as an unqualified success. It is the record of the struggles of an able woman to adapt herself to the life of an invalid when suddenly arrested in a musician's career by a form of heart disease, involving frequent and severe anginal attacks, which it is stated "keeps her life in constant jeopardy." The first part is called "The Drama of the Inner Self," which the author herself thinks ought not to see daylight but of which, owing to the solicitude of friends, she publishes the less intimate parts. It is written in a spirit of religious exaltation. The second part, "The Drama of the Environment," however, shows that the triumph over the self has not been completely successful, for the greater part of it is occupied by vivid complaints of the attitude which the healthy adopt towards the sick. Many of these are doubtless justified, but they do suggest a sublimation less perfect than is claimed by the writer of the preface. However, to make amends, the last chapter is devoted to some useful and helpful advice to other invalids. The English title rather exaggerates the tone of the original French one, *Servitude et Grandeur de la Maladie*, but we cannot help feeling that sentences such as this have an element of, probably unconscious, dramatization: "The agony in the Garden of Gethsemane, the help vanishing when the strong appeal is made, the nearest and dearest friends asleep, the reiterated protestations and denials of St. Peter, these are tragedies which we have lived through again and again." The impression is left on the mind that the author is right in saying that a trench is dug by illness between the invalid and the healthy; indeed, the trench seems so wide in these pages that one wonders how it can really be bridged. "'Take care,' a friend said to me in words which showed that she did not in the least understand. "You seem to think that sickness is in itself a higher kind of life.' 'Certainly not!' I replied." We wonder whether that friend was wise in trying to underrate a compensatory mechanism.

The author naturally has a wide experience of doctors and speaks well of the majority. She gives some good examples, however, of things that doctors should *not* say to patients.

PICTORIAL AIDS TO ANATOMY

Illustrations of Regional Anatomy. By E. B. Jamieson, M.D. Third edition. Section I. Central Nervous System. (49 plates. 7s. 6d., plus 6d. postage.) Section II. Head and Neck. (64 plates. 15s., plus 7d. postage.) Section III. Abdomen. (41 plates. 6s., plus 5d. postage.) Section IV. Pelvis. (34 plates. 4s., plus 5d. postage.) Section V. Thorax. (31 plates. 4s., plus 5d. postage.) Edinburgh: E. and S. Livingstone. 1941.

Notwithstanding difficulties arising from the demand for skilled labour and material during wartime, the first five sections of Dr. E. B. Jamieson's *Illustrations of Regional Anatomy* have been duly produced, and contain many valuable additions and improvements. No fewer than 300 colour-blocks have been prepared for this edition. Some of the enlargements showing small details of parts such as the middle ear, or the relations of the vessels to the gall-bladder and its duct in the region of the first part of the duodenum, are especially worthy of note, and also the beautifully executed plates showing the sacral plexus on a dark background. Some of the plates described as "schematic" are perhaps too conventional, and give unmistakable evidence of having been composed to fit in with common conceptions rather than the more ideal method of drawing from actual specimens and afterwards, when necessary, simplifying by the suppression or omission of unwanted details. The general excellence and popularity of this work are, however, evidenced by its large sale, estimated to be over 45,000. This is probably due in the main to its value as a pictorial aid to a quick comprehension of the necessarily lengthy descriptions of anatomical text-books. The latter are, however, indispensable for gaining a sound knowledge of the significance of the relation of the structures which are so skilfully displayed in the coloured plates. Verbal descriptions, moreover, provide an opportunity of giving some indication of the practical application of the topographical knowledge acquired by dissection

the use of illustrations. It is also important that it ould be generally realized that there is a real danger making anatomy too easy, and that parts seen during peration have a very different appearance from that hich might be expected from impressions gained solely om diagrams and coloured plates. The plates therefore ust be regarded as being supplementary to practical ork in the dissecting room, carried out with the help of good descriptive manual, rather than being complete in emselves. Employed in this way and as a reminder of nowledge previously acquired they should be of great alue to both student and practitioner.

CHEMISTRY AND MEDICINE

Chemistry and Medicine. Papers presented at the Fiftieth Anniversary of the Founding of the Medical School of the University of Minnesota. Edited by Maurice B. Visscher, Professor of Physiology at the University of Minnesota. (Pp. 296. 28s.) Minneapolis: University of Minnesota Press; London: Oxford University Press.

he University of Minnesota in 1939 celebrated the fiftieth nniversary of the establishment of its medical school, nd has published in volume form a series of papers resented on that occasion. These deal with the influence f chemistry on the modern development of medical cience. Various selected aspects of this subject are dis-ussed, and the volume provides interesting evidence of he extent to which medicine has become dependent upon hemistry.

Many of the most important recent advances in medicine re generally recognized as examples of applied chemistry ulphonamide therapy, which is described by Prof. Long, s an example of this type. The dependence of the science f vitamins on organic chemistry is equally clear, and in his case a table provided by Prof. Smith is of interest n that it demonstrates the remarkable acceleration that as occurred in the isolation and synthesis of vitamins. The existence of the three original vitamins—A, B, and C —was demonstrated about 1912, but their synthesis was ot achieved until twenty-five years later. On the other and, vitamins B_6 and K, proved to exist in 1936, were solated and synthesized within three years. The table actually lists six vitamins that have been synthesized during he past five years. This remarkable acceleration in progress is due to the great advances in analytical methods, chief among which is the perfection of methods of spectrum analysis. Endocrine secretions are not dealt with in this volume, but their history shows a similar, if less spectacular, acceleration in the rate of progress due to advances in organic chemistry. The dependence of chemotherapy, "vitaminology," and endocrinology upon organic chemistry is so well recognized that it needs little comment.

Other chapters in the book, however, summarize the importance of chemistry in fields where its influence is not so obvious. Prof. Heidelberger shows that immunity is slowly but steadily being reduced to a chemical problem. This is largely due to the work of Landsteiner, who found that artificial antigens could be constructed by combining proteins with chemicals. This work, combined with microchemical analysis, has made it possible to study the antigen-antibody reaction as a problem in quantitative chemistry and to write empirical formulae for the composition of the precipitates resulting. The subject of filterable viruses, discussed by Prof. Green, is another field which is influenced profoundly by protein chemistry, as in this case it has been found possible to crystallize viruses and to estimate their molecular weight. Finally, Prof. Cannon, in a short article on the chemical mediation of nerve impulses, assembles a strong case in support of the view that the transmission of impulses from a nerve cell to another cell is served by the liberation of acetylcholine and adrenaline. This is, of course, a highly controversial subject, but the author outlines his case with remarkable clarity. The transmission of nerve impulses was regarded only a few years ago as a problem of electrophysics, and the possibility of treating it as a problem of organic and enzyme chemistry is remarkable evidence of the change that modern chemistry is effecting not only in medicine but in the fundamental problems of physiology.

Notes on Books

The official *Medical Register* for 1941 has now been published on behalf of the General Medical Council by Constable and Co. at 21s., post free 22s. 6d. The table printed in the introductory section shows that 2,384 names were added last year. New registrations numbered 1,323 in England, 673 in Scotland, 315 in Ireland, 57 on the colonial register, and 16 on the foreign register. The total number of names on the *Register* at the end of the year was 64,679—1,319 more than in 1939. The number of names removed from the *Register* during 1940 was 1,102; of these 1,071 were deleted on evidence of death, 24 for failure to comply with the inquiries of the registrar as to cessation of practice or change of address, and seven were struck off under the disciplinary powers conferred by Parliament on the General Medical Council.

The first edition of *The Diagnosis and Treatment of Pulmonary Tuberculosis*, by JOHN B. HAWES and MOSES J. STONE, was published in 1936 and was very favourably reviewed in these columns. The second edition recently published (Henry Kimpton, 12s. 6d.) has been revised by Dr. Stone. It is our opinion that this small volume has not gained in value by this revision. The excellent presentation of "essentials" has suffered by introducing the classifications of "childhood and adult types of tuberculosis" and "productive and exudative types of tuberculosis." In particular the latter distinction must lead to confusion in the proper application of collapse therapy. Further, in an elementary textbook in which the authors speak of "pneumothorax or 'gas treatment'" and of "thoracoplasty, or the rib operation," the wisdom of presenting a large number of radiographs might be questioned. Their choice, moreover, appears to have been little studied by either publishers or author, since some reproductions are of positives, others of negatives; some postero-anterior, others anteroposterior; some of excellent quality, others obviously of films taken either with a very poor technique or with apparatus dating from the early days of chest radiography. Despite these criticisms this remains probably the best small book on the subject in English.

Three years ago the fourth edition of *Operative Surgery*, by J. SHELTON HORSLEY and ISAAC A. BIGGER, earned our favourable comment; now a fifth edition brings it up to date and includes such recent surgical procedures as ligation of the patent ductus arteriosus, which was first successfully performed in 1938 by Gross of Boston, and an account of the operation for performing extrapleural pneumothorax, a procedure which, although originally carried out in 1891 by Tuffier in Paris, did not come into its own until about three years ago and now apparently has a definite place in the surgery of phthisis. Neurosurgery is brought up to date in a section written by Dr. C. C. Coleman, urology in that by Dr. Austin I. Dodson, orthopaedics in a section by Dr. Donald M. Faulkner, and plastic surgery in articles by Dr. John S. Horsley, jun. This delightful, clearly and well illustrated, and easily read two-volume work is the best of its kind that we know. All that we said in favour of the fourth edition, and as our American friends might graphically say, "and then some," applies to this new edition. If asked by one about to begin surgical practice to recommend a really good modern guide to its operative aspects, we should unhesitatingly name this edition of Horsley and Bigger. It is published in two volumes at £4 10s. by Henry Kimpton.

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TREATMENT OF BURNS

Interest in burns has been greatly stimulated by their increased incidence due to the war, and much discussion, not always tempered by clear thinking, is taking place as to the merits of this or that treatment. The variation in type and distribution of burns is at present resulting in personal experiences which, because of their limited nature, give a one-sided view of a large problem, and from which conclusions may be drawn having less general validity than their sponsors realize. Thus the experience of a surgeon dealing with R.A.F. personnel may be very different from that of one dealing with the victims of their opponents. Recent discussions and contributions to the medical press have shown dissatisfaction with established methods of treatment, and the war has seen already many attempts to improve upon them. At a time when there is no general agreement as to the best methods it may be well to pause and take stock of the problem as a whole.

Two features distinguish thermal from other injuries: their special danger to life if extensive, and the crippling nature of their scars in many parts of the body. The two aspects of treatment—saving of life and saving of function—cannot be separated, but either may predominate even to the exclusion of the other. There are burns that menace life but not function (for example, a large superficial body burn), others that menace function but not life (for example, burns of the hands): these examples are given with the suggestion that uniformity of treatment of burns is neither desirable nor possible. The danger to life depends on extent rather than depth of burn, and to a smaller degree on situation. Burns kill by shock, toxaemia, or sepsis. The treatment of shock due to burns is on the same lines as for other forms of traumatic shock, but often merging with shock is the peculiar state known as burn toxaemia, which, while presenting some of the features of the former condition, has additional characteristics, notably fever and evidence of liver damage. There are three theories as to the cause of burn toxaemia: first, that it is due to a disturbance of the fluid and electrolyte balance of the body; second, that it is the result of sepsis; and, third, that a specific toxin is elaborated in the burnt tissues. Elkinton[1] has shown that correction of the recognized abnormalities in the blood does not prevent the condition, and Wilson, Macgregor, and Stewart[2] have observed it in cases in which cultures from the burns and blood were sterile. The liver damage described post mortem by Wilson *et al.* and confirmed in life by liver-function tests by Wolff, Elkinton, and Rhoads[3] is suggestive of the action of a toxin and has led to the recognition of glucose as an important part of the treatment of severe burns.

[1] *Bull. Ayer clin. Lab.*, 1939, **3**, 279.
[2] *Brit. J. Surg.*, 1938, **25**, 826.
[3] *Ann. Surg.*, 1940, **112**, 158.

At the present time, however, discussion centres round the local rather than the general treatment of burns, and has become a little heated between the advocates and critics of coagulation methods. As there is a trend of opinion away from these methods it is important to remember that one of the chief claims made for tannic acid was its reduction of mortality. Wilson[4] has produced evidence of this, and McClure[5] in a recent summary of the position points out that U.S.A. statistics showed a fall in the annual number of deaths from burns after the introduction of the tannic acid treatment by Davidson, although since 1933 there has been no further fall.

The problem of local treatment depends, first, on the depth of the burn. If there is no full-thickness loss of skin good healing should follow any method that prevents sepsis. Healing, moreover, should be rapid, since except for raised epidermis there is no macroscopic death of tissue and no sloughs to separate. In this type of burn rapidity of healing may eventually decide the choice of method. Although the deep layers of skin survive they are no barrier to the entry of organisms, and it is not sufficiently recognized that infection of a superficial burn may convert a partial into a full loss of skin thickness. This risk is particularly serious when infection appears under a coagulum, since the damage may occur before the sepsis is recognized. This phenomenon can be seen in tanned donor areas of razor grafts in which there is no doubt as to the depth of the original injury. When the whole thickness of the skin and deeper structures are destroyed sepsis may be more difficult to control, and, furthermore, healing cannot take place until the dead tissue has separated. These burns present two further problems: the removal of sloughs, and the covering of the resulting defect, which often calls for skin grafting. The early separation of sloughs and repair of the defects assume special importance in those parts where function is endangered—the hands, the face, and the flexures. Now it may well be that sepsis hastens the separation of sloughs and that its prevention will delay it. Most surgeons have seen small areas of dry gangrene of the skin due to heat or pressure (both occur in air-raid casualties) which remain clean and take weeks to separate, and most, too, have noted the rapidity with which a large mass of tissue may separate from a septic pressure sore. It is likely, therefore, that the control of sepsis will throw into prominence the problem of separating sloughs, and methods of accelerating this process are already being studied. In small deep burns the slow natural progress of the lesion has led some surgeons to excise and graft immediately.

In superficial burns we require of local treatment no more than protection of the lesion from further injury, mechanical or infective, until healing is complete, and of methods which fulfil these requirements preference will be given to the quickest. In deep burns we need control of sepsis, and rapid removal of dead tissue and its early replacement by grafting or artificial stimulation of natural healing. Coagulation methods fulfil these requirements in part only. They give a fair protection against secondary infection but do not control that introduced before treatment, and it has

[4] M.R.C. Reports, 1929, No. 141.
[5] *J. Amer. med. Ass.*, 1939, **113**, 1803.

always been recognized as an essential part of the treatment that the burnt surface should be rendered sterile or nearly so by careful cleansing before the coagulating agent is applied. It has also been claimed for these methods that they provide optimum conditions for healing by splinting the affected part. This is probably beneficial in the trunk and limited areas of the limbs, but splinting of the hands for the long time during which a coagulum may remain adherent would be tolerated for no other form of injury, because of its crippling effect on function. This is one reason why the E.M.S.[6] advised that hands should not be tanned. Another is that tan contracts and may produce further damage by causing ischaemia. This has been disputed and is difficult to prove, but the splinting effect of the tan and the very long time it takes to separate in deep burns should alone condemn the method for burns of the hands.

The failure of coagulation methods to control sepsis may be eliminated by the use of drugs of the sulphonamide group, as recommended in the latest E.M.S. memorandum on burns.[7] The use of these drugs is the most important novelty in the treatment of burns, and an example of its application is described in this number by Robson and Wallace. Whether their paste has any virtue apart from its sulphonamide content is doubtful, nor is it clear why albucid is preferred to other available sulphonamides. Most of their cases are of superficial burns, and the method appears to fulfil the requirements which we suggested for this type—namely, protection of the lesion from mechanical and bacterial injury—and appears to be applicable to all parts of the body. With regard to their implied aspersion on the saline treatment, perhaps the authors have not realized that when this is properly carried out it includes dusting the burn with sulphanilamide whenever the tulle gras is changed (E.M.S. memorandum). It seems possible that with the addition of sulphonamides any method of treating burns will be improved, and even carron oil may return to favour.

Apart from the use of applications containing sulphonamides such as that described by Robson and Wallace, the most widely used alternative to coagulation at present is the saline method described in the E.M.S. memorandum. This aims at controlling sepsis with sulphanilamide and keeping the lesions bathed in physiological salt solution until healed or ready for grafting. The details vary with the part of the body burnt, but one or more daily saline baths are given to the injured parts, which are kept moist between the baths with saline dressings laid over tulle gras to prevent adhesion. It is to be hoped that before long some results will be published of this treatment, which was advocated by several speakers at a recent discussion at the Royal Society of Medicine. A variant of this method is that described by Bunyan,[8] who maintains constant bathing of the lesions in saline and hypochlorite solutions in oiled silk envelopes adapted with much ingenuity to various parts of the body. From time to time the envelope is flushed out with solution to remove discharges and debris. Two advantages are claimed for this method: that it controls sepsis without the addition of other drugs, and that it hastens the separation of dead tissue.

It has yet to be shown that any of the alternatives to coagulation therapy are as beneficial when the burn is extensive enough to endanger life, and the E.M.S. memorandum suggests that coagulation is still the method of choice for such cases. In the war burns about which there has been dispute, however, the risk is nearly always to function rather than to life. This is particularly true of the burns of the hands and face, which are mostly caused by short exposure to very high temperatures—either flash burns, against which clothing protects the body, or flame burns as sustained by air personnel. The flash burn may involve the whole hand without anywhere destroying full thickness of skin; if this is tanned, the hand is enclosed in a semi-rigid glove which prevents movement and may, as it contracts, produce dangerous constriction. In this way a superficial burn may result in a stiff hand which takes months to recover, if it ever does. Even worse will be the stiffness after deep burns of the hands, from which the coagulum separates very slowly. It is no answer to this criticism to say that many tanned burns of the hands do very well. A small percentage of disasters is enough to condemn any method.

[6] E.M.S. Gen. 325, amendment to, Oct., 1940.
[7] E.M.S. Gen., 343, Feb., 1941 (see *British Medical Journal*, to-day's issue, p. 489).
[8] *Proc. roy. Soc. Med.*, 1940, 34, 65.

HEALTH AND SAFETY IN FACTORIES

No one will be surprised to learn that there was a large increase in industrial accidents in the early part of the war. During the first six months the number of non-fatal accidents in factories rose by 42%, and of fatal accidents by 13%, compared with the six months from September, 1938, to February, 1939. One thinks immediately of the black-out, an experience without precedent in the history of this country, pressing hardest of all perhaps upon those engaged in industry, affecting the physical and psychological conditions of their daily work and hindering and endangering their transport. But the black-out causes its accidents outside rather than inside the factories, and in the annual report of the Chief Inspector of Factories for 1939, which has only lately been published,[9] it is placed sixth among the seven causes of increased accidents in wartime. The others are the increased number of persons employed, with extension of hours of work, neglect of safety precautions due to speeding up of production, shift of working population from relatively safe to accident-producing industries, fatigue and mental stress, and the bringing back into industry of machines in various stages of obsolescence.

During 1939 as a whole there was an increase amounting to 17% of fatal and 7% of non-fatal accidents, but there was actually a decrease of 2% in the number of accidents to young persons, one of the first-fruits of the tightening of safety conditions brought about by the new Factories Act. The industries in which accidents were most numerous were those concerned with war production. In the manufacture of aeroplanes, for example, the accident rate went up by 20%. The total number of accidents in industry

[9] Cmd. 6251. Annual Report of the Chief Inspector of Factories for the Year 1939. H.M. Stationery Office. (1s. net; postage extra.) 1941.

(meaning those which were either fatal or disabled the workman for more than three days) was 193,475, of which 1,104 resulted in death. The largest number (25,358) were due to persons falling; building operations contributed most to this form of accident. There were 6,742 accidents in the cotton industry, but only 23 were fatal, and in the woollen industry, with 3,884 accidents, the death roll was only 18. One fact which has emerged from an inquiry into the subject is that the number of accidents reaches its maximum in the middle of the morning or afternoon—that is to say, some three hours after starting or restarting work. The more serious by-product of the black-out so far as workers in factories are concerned is the effect on health. In many cases, at the beginning of the war, factory windows were obscured with black paint, which entailed working under artificial light all the time, with unhappy consequences both for health and output. One irony of the situation is that modern factory architecture had been advancing towards large window-space, which had greatly improved the conditions, but meant a bigger problem and a bigger deprivation when lighting restrictions came in; while another irony was that modern housing estates had been placed outside industrial areas, greatly to the workers' advantage until the black-out imposed what was virtually a prolongation of hours of work and strain. A well-deserved tribute is paid in the report to the philosophical way in which the workers have accepted the position and made the best of it.

The black-out adds to the strain of war work by interfering with ventilation, increasing the risk of gassing in various occupations, raising the temperature of workrooms to an uncomfortable level, and depriving the workers of ordinary daylight. But conditions have been improving in this respect, and no doubt the Chief Inspector's report for 1940 will describe not merely an adaptation of workers to bad conditions but a better adaptation of conditions to workers' normal requirements. Dr. J. C. Bridge, Senior Medical Inspector, whose section in these annual reports is always looked forward to as a valuable commentary on industrial medicine, says that before the outbreak of war the number of accidents from gas or fumes was below previous years, but during the last quarter of 1939 the number of reported cases of gassing was approximately double that of any previous quarter of the year. Where localized exhaust ventilation is effectively installed the measures taken to obscure lighting may be without detriment, but where natural ventilation is relied upon, as in blast furnaces, the tale is very different. The total number of cases of gassing reported during the year was 184, with 11 deaths. Carbon monoxide was the agent in 84 cases, chlorine in 29, and nickel carbonyl in 10. The first case of fluorine osteosclerosis in this country was brought to the notice of the Department during the year, and an investigation was still proceeding when the report was written.

Cases of industrial poisoning or disease notifiable nder Section 66 of the new Factories Act showed a very considerable fall during the year. There were 109 notifications of lead poisoning, with 6 deaths. Only 15 of these cases, with 1 death, were due to the painting of buildings, an occupation which, two decades ago, was attended by more than 20 deaths a year. Cases of anthrax numbered 37, with 5 deaths; epitheliomatous ulceration, 160 cases, with 31 deaths, chiefly in the pitch industries; and chrome ulceration, 159 cases, chiefly in chromium plating, with no deaths. The number of deaths from silicosis—439—remained about the same as in previous years. Of these deaths 197 occurred among coal miners, 70 among sandstone masons, and 51 among men engaged in the manufacture of pottery. The number of voluntarily reported cases of dermatitis continues to increase: in 1939 it was nearly 3,000. The largest numbers occurred in chemical manufacture, mechanical engineering, and the manufacture and making up of textiles. The baking and biscuit trades contributed only a little over 4% of the cases.

The number of young persons, between 14 and 16 years of age, examined for certificates of fitness during 1939 was 406,575: the rejections numbered 5,681, and the conditional or provisional certificates 15,702. The chief cause of rejection was pediculosis; next come diseases of the eyes and eyelids. Defective bodily development accounted for only a little over 2% of the rejections. The term "medical supervision" is still vague and indefinite. Dr. Bridge points out that the frequent practice of engaging a medical man to be available for the treatment of accidents or to examine workers in relation to liability to compensation cannot be considered as a form of medical supervision. Many firms have gone further by engaging the part-time service of a medical man to supervise first-aid arrangements as well as to undertake examinations. A limited number have enlisted the whole-time service of a doctor whose duty it is to prevent and alleviate sickness and injury. Firms manufacturing foodstuffs and drugs are naturally more likely to realize the value of this whole-time supervision, but many other undertakings of equal size, concerned with engineering, paper-making, artificial silk, and other industries, have taken similar steps. Medical supervision for specific purposes plays an important part in factories where special work of national importance has to be done, and the Ministry of Supply has appointed whole-time medical officers in factories, some of which require more than one medical officer, and some have both men and women medical officers. As for other firms, where the occupation presents little or no risk to health the services of a trained nurse may be utilized for the care of the workers, and Dr. Bridge thinks that such care, when it is, as it should be, linked with a call on the local medical practitioner, must often suffice.

TREATMENT OF G.P.I.

The death of the distinguished emeritus professor of psychiatry in the University of Vienna, Prof. Wagner-Jauregg, brings to mind one of the major therapeutic discoveries of our time. He will always be remembered as the pioneer in the treatment by artificial malarial infection of general paralysis of the insane, "dementia paralytica." These names themselves mark the gloom of the outlook before his work fructified, while the arguments on terminology—whether it shall be called "cerebral parenchymatous syphilis" or more briefly "paresis," instead of by its traditional name—are evidence not only of changing pathological knowledge and conceptions but also of the new view of the course and prognosis that malarial therapy

has induced. Like a number of other important discoveries it was the result of the application of a casual observation made by others before him. Bumke[1] quotes Jakobi, Ludwig Mayer, Schule, and v. Halban as having observed that manic cases especially of G.P.I. were favourably influenced by intercurrent febrile infections. But often in the history of scientific discovery the initiative and energy needed to follow up an apparently small observation and to realize its significance have not been found in the original observer. Wagner-Jauregg tried a number of febrifacient means, including tuberculin, and his conclusion that malaria is at least as satisfactory as any other method has not really been superseded. Rivals of the bacterial and virus sorts have not established their position. The most recent competitor of this type has been a Rickettsia virus, which has the advantage of cultivability *in vitro*; but the method which, after malaria itself, appears to have been most used (apart from the pharmacological non-pyrexial one with tryparsamide) has been the electrical one of producing fever; this has the advantage of being subject to readier control than any of the others. Very recently what appears to be a model of team-work, comprising a group of hospitals and the public health service, has been exhibited in the U.S.A. in an investigation of the result of the electrical as opposed to the malarial method of producing pyrexia (O'Leary *et al.*[2]). In a total of 1,420 cases, of which 1,100 were treated by malaria and 320 by "artificial fever" (oddly enough the precise method is nowhere stated in the paper), the results were closely similar with patients suffering from mild and intermediate degrees of general paralysis, but very much in favour of diathermy in patients with a severe degree of the condition—i.e., those showing considerable mental deterioration.

The history of the treatment of general paralysis is one of continued advance since 1917, after a long plateau of time in which clinicians first learned to elaborate the description of a fascinating but devastating disease; then bacteriologists demonstrated the causal relation to it of syphilis. It is curious to reflect that, although Wagner-Jauregg began his therapeutic experiments in general paralysis so long ago as 1887, when he tried the effect of the inoculation of erysipelatous material, it was not apparently until thirty years later that he took up the problem again and this time solved it, as events have proved; for the whole outlook in the disease has changed, and, apart from technical improvements in treatment, further advance depends almost entirely on early diagnosis, and on social factors such as education. The success of a purely electrical method implies also a theoretical contribution, since evidently it is the pyrexial effect which is the therapeutic agent. Weichbrodt and Jahnel[3] had shown that in rabbits a temperature of 42° to 44° C. led to disappearance of the spirochaetes from the primary lesion, but this was not thought convincing, as such high temperatures were rarely if ever reached in malaria. In this connexion, however, not only is the therapeutic effect of diathermy noteworthy, but so also is the fact that the best results in the American series were obtained in cases in which the fever was highest (106° to 106.4° F.), although no better result was obtained by proceeding to still higher levels than this. It does not necessarily follow that the spirochaete cannot survive such temperatures *in vitro*; it is possible that the effect depends on hormonal alterations which make life impossible for the spirochaete in the body. That this may be the explanation is suggested by the observation that epilepsy, a purely neural process, may be improved after acute fevers. It is odd that no one seems to have followed this old scent in the case of epilepsy, as Wagner-Jauregg did so faithfully and persistently for general paralysis, transforming a prospect of ineluctable disaster into one of measured hope.

[1] *Lehrbuch der Geisteskrankheiten*, Munich, 1936.
[2] *J. Amer. med. Ass.*, 1940, 115, 677.
[3] Bumke, O., *Handbuch der Geisteskrankheiten*, 7, Teil 3, Berlin, 1928.

DURATION OF SECONDARY SCHOOL LIFE

One of the most important factors, if not the most important, affecting the efficiency of the entire system of secondary school education is that children should remain at school long enough to profit adequately by the facilities provided. In a recent paper Frank Sandon[1] presents data of the greatest interest on the methods of measurement of the duration of secondary school life, together with an analysis of some of the factors affecting it. He begins with a criticism of the statistical methods used by the Board of Education. These introduce anomalies into the measurements and ignore such factors as sex and the effect of transfer from school to school within the system. He proposes, instead, a system which is almost strictly analogous to the calculation and utilization of the ordinary actuarial life-tables. Thus it is possible to speak of "entrants" and "exitants" (instead of leavers), "survivors," "mortality," "expectation of life," and so forth, using these terms for the duration of secondary school life just as they are used in connexion with life-tables. Sandon applies his methods to data carefully collected from a single mixed secondary school over a period of ten years. The numbers, therefore, are not large, but even so the conclusions are of high interest.

In the case of the boys two outstanding factors affect the duration of secondary school life. One is social class; and in this connexion it is striking that a relatively slight improvement in socio-economic status results in a very considerable extension of school life. The second is the opportunity for employment. It was found that when conditions in the labour market were bad boys stayed on longer. When employment conditions improved parents tended to make sure as soon as they could of some sort of job for their sons—almost no matter what it was, as they often told the head master. Academic ability proved to be a minor influence. The brilliant certainly stay longer, and the dull have a shorter school life. Apart from these extremes, the less able stay longer at school. There seems to be a tendency to stay on in order to pass the School Certificate examination, but this is far weaker than the tendency to leave in order to secure employment. Age at entry is also a minor influence; not unexpectedly the younger entrants tend to have a longer school life. The results for girls are quite different from those for the boys. Girls have a shorter school life and tend to stay at school primarily for general educational purposes rather than as a preparation for the passing of particular examinations. The effect of economic pressure is less marked than in the case of boys. The author concludes that girls tend to stay on as long as they continue to make some headway with the work and for that period which local custom has established as conventional.

The data present an exceptional opportunity for the examination of one point. In 1936 it was decided to close the school in question at the end of the summer term of 1937, no new pupils being admitted after September, 1936; survivors in September, 1937, were to be transferred to other schools in the area. This provided an occasion for examining the effect of transfers. It was found that the effect among the boys was to increase the leavers by 50%. Among the girls the effect was even more disastrous. In view of recent recommendations, which if adopted would increase such transfers, it is clear that this point merits further and close research. The most signifi-

[1] *Ann. Eugenics*, 1940, 10, 253.

cant thing about the paper is not, however, the actual data it presents. It is an essay in method, and points the way to a more efficient system of collecting and analysing the mass of data available to large authorities. Research on these lines should prove a sound guide to our administrators who, Sandon suggests with some acidity, "at present seem to be guided by their prejudices, their impressions, and their reading of Quintilian."

MEDULLOTROPHIC AND PANCREOTROPHIC ACTIVITY

In the early part of last year Professor Collip of Montreal reported the demonstration of medullotrophic activity in a primary alcoholic extract of the anterior pituitary gland. This extract stimulated the "dark cells" of the adrenal medulla in the hypophysectomized rat.[1] More important, it dimipished the blood sugar and glycosuria in diabetic patients and produced hypoglycaemia in some normal animals. A unique property of the extract was that it was active when given by mouth. In the summary of his second paper[2] Professor Collip suggested that his extract exerted "a profound effect upon carbohydrate metabolism." Comment on these findings in this *Journal*[3] displayed interest tempered with a certain amount of scepticism, chiefly due to the fragmentary nature of the evidence provided in what it was assumed were merely preliminary notes. Further publications on the subject have not yet, however, reached this country, and the implied scepticism has obtained a more factual basis from the recent publication of two papers by Lawrence and Young[4] and by Marks and Young.[5] In the former paper the authors record their findings when alcoholic extracts of fresh ox anterior pituitary prepared according to the method of Collip[6] were given orally to four diabetic patients. No diminution of glucose excretion or of blood-sugar level was observed. The authors also found no demonstrable effect when the extracts were fed to or injected into "pituitary-diabetic" dogs. These are the dogs, first described by Young, which develop a permanent diabetes after massive injections of crude anterior pituitary extract. They are called "chiens de Young" in France, but in this country phonetic ambiguity deprives Dr. Young of the honour, already accorded to Professor Houssay, of having the preparation named after him.

Marks and Young[5] examine the claim of Collip that the alcoholic extract contains pancreotrophic activity. They performed their tests by giving the extract daily to a group of ten rats for fourteen days and subsequently estimating the insulin content of the pancreases of the treated animals. Collip's alcoholic extract did not increase the insulin content of the pancreas whether given by mouth or by injection. Other extracts of the anterior pituitary gland did, however, exhibit pancreotrophic activity and were investigated. The most important result of the experiments was in the distinguishing of the pancreotrophic activity from the activities of the anterior pituitary hormones. First, as oestrogens were known to have a pancreotrophic action, testosterone was injected, but had no effect on the insulin content of the pancreas. This fact, combined with the fact that castration had no influence on the pancreotrophic activity of the pituitary extracts, showed that the gonadotrophic factor of the pituitary was not responsible for the effect. Further proof of this distinction lies in the fact that gonadotrophically inactive preparations may have pancreotrophic activity. Similar facts differentiate the pancreotrophic effect from prolactin and from thyrotrophin. It is distinguished from the glycotrophic factor by virtue of its instability to heat. Species differences were found in the content of pituitary gland in pancreotrophic activity. These observations show that pituitary extracts do contain a distinct factor which raises the insulin content of the pancreas in the rat, but the authors are careful to emphasize that neither in their laboratory nor in that of Professor Best in Toronto, who is also working on this problem, has any evidence been brought forward to show that the factor plays any physiological part in the normal organism. It is not yet entitled to be called a hormone. Whether or not Professor Collip's extract is entitled even to be called a factor remains to be proved.

[Since the above note was written Prof. Collip has withdrawn his claims, describing their publication as a "serious error in judgment."[7]]

[1] *Canad. med. Ass. J.*, 1940, 42, 2.
[2] Ibid., 109.
[3] *British Medical Journal*, 1940, 1, 1024.
[4] *Lancet*, 1940, 2, 709.
[5] Ibid., 710.
[6] *Cyclopedia of Medicine*, Philadelphia, 1939, 11, 637.
[7] *Lancet*, 1941, 1, 277.

NEW F.R.S.s

The names of twenty new Fellows of the Royal Society were announced last week. They include Surgeon Rear-Admiral Sheldon F. Dudley, M.D., F.R.C.P., Medical Director-General of the Navy (designate); John Carew Eccles, M.B., F.R.A.C.P., Director of the Kanematsu Memorial Institute for Pathology, Sydney, formerly Fellow and Tutor of Magdalen College and University Demonstrator in Physiology at Oxford; H. W. Florey, Ph.D., M.B., Professor of Pathology at Oxford; Joseph Needham, Sc.D., Reader in Biochemistry at Cambridge; H. G. Thornton, head of the bacteriology department, Rothamsted Experimental Station; and P. Bruce White, B.Sc., of the department of experimental pathology and bacteriology at the National Institute for Medical Research, Hampstead. Admiral Dudley is at present medical officer in charge of the R.N. Hospital, Chatham; he was formerly director of medical studies and professor of hygiene and pathology at the Royal Naval College, Greenwich, and he has published many papers and reports on bacteriological and epidemiological subjects. Professor Florey (like Dr. Eccles) is a former Rhodes scholar from Australia, and he held the chair of pathology at Sheffield for four years before his return to Oxford. Dr. Needham was Oliver-Sharpey lecturer at the Royal College of Physicians, 1935–6, and is well known for his philosophical writings on embryology and biochemistry. Mr. Bruce White has made fundamental studies of the antigenic constituents of the different species or organisms belonging to the vibrio group.

Mr. L. R. Broster has received an invitation from the American Surgical Association to be their guest and speak at their annual meeting at White Sulphur Springs, Virginia. The Medical College of Virginia has also asked him to deliver the McGuire Foundation Address on his research work on the adrenal gland. These invitations are very welcome as expressing the sympathy that exists between the medical professions of the United States and the British Commonwealth, and as affording a British surgeon the opportunity to give his colleagues in the U.S.A. a first-hand account of our problems in this country.

We regret to announce the death at the age of 90 of Sir William Smyly, M.D., for many years one of the leading obstetricians and gynaecologists in Dublin. He was a past President of the Royal College of Physicians of Ireland and of the Leinster Branch of the British Medical Association.

LOCAL TREATMENT OF BURNS

E.M.S. MEMORANDUM

The notes on the local treatment of burns printed below are based on the recommendations of the co-ordinating team on burns appointed by the War Wounds Committee of the Medical Research Council. The full text of the memorandum has been circulated from the Ministry of Health for the guidance of medical officers in Emergency Medical Service hospitals and first-aid posts. It is designated E.M.S./Gen./343.

Treatment at the First-aid Post

Minor burns which do not require admission to hospital should, after cleansing the surface with plenty of soap and water, be dressed in the following way: (1) in the case of the face or hands, with gauze or lint impregnated with sterilized vaseline; (2) in other parts of the body, with tannic acid jelly or gentian violet jelly, 1%. If jellies are used no *dressing* should be applied over the burnt area, and clothing must not be allowed to come into contact with the burn area until the coagulum has formed and is dry. The application of tannic acid or other coagulant jelly to the surface of a burn which has not been adequately cleansed is inadvisable.

Serious burns requiring admission to hospital should be treated by the application of sterile vaseline[1] on gauze or lint to cover the exposed portions of the burn. Provided the patient is shortly to be transferred to a near-by hospital, no attempt should be made to remove clothing in order to expose the entire burn area. Serious burns always require injections of morphine for pain, in full doses (1/3 to 1 2 grain for adults).

Local Treatment in Hospital

At the first hospital, where the case can be fully treated, the following lines of local treatment are advised for extensive burns of whatever degree.

Under gas-and-oxygen or pentothal anaesthesia, the burn areas should be thoroughly cleansed by the gentle but liberal use of soap and water, followed by saline and by the removal of debris under strict aseptic precautions (soft soap should not be used; the best application is some form of soap flakes). No violent scrubbing or scraping should be used, nor should antiseptic solutions or spirit be employed. If the burn area is impregnated with oil or grease, ether soap is of value for cleansing. *Extensive burns should never be fully exposed at one time*, owing to the risk of increasing shock by loss of body heat: a limited area only should be exposed for treatment, which should be completed before the next area is dealt with. *Loss of heat is especially marked when ether soap is used.* After the cleansing process has been completed, the burn surface and the skin around should be dried and the burn surface should be lightly dusted with sulphanilamide powder: a coagulant is then applied, except on the face, hands and wrists, and feet.

Coagulant Applications

The following solutions are the most suitable, as they act quickly and require no special apparatus, etc.:

1. Silver nitrate, 10%.
2. Tannic acid, 10%.
3. Silver nitrate, 10%, and tannic acid, 5%, used alternately.
4. "Triple dye." (One formula in common use is gentian violet, 1 in 400; brilliant green, 1 in 400; with neutral acriflavine, 1 in 1,000. The solutions are mixed in equal proportions.)

The application is best made by the use of a large gauze mop; no dressings are required over the coagulated area, but it is advisable to cover the part with a sterile towel after the coagulum is dry. The edges of the area and any cracks that may develop on the surface should be dusted daily with sulphanilamide powder. In whatever way coagulation is effected the coagulum must cover the whole area and a good margin of unaffected skin around, and must be firm and dry, or else the effect of the treatment is lost as the patient will still lose fluid from the burn area.

The areas in which no coagulant of any kind should be used are the face, the hands and wrists, and the feet. In addition to the solutions given above, tannic acid jelly and gentian violet jelly are coagulants. Circumferential tanning of a limb should be avoided if possible, and if carried out the peripheral pulse must be carefully watched for the first forty-eight hours. Coagulants tend to contract on drying, and there is a risk of dangerous constriction of vessels or distortion of tissues—for example, the fingers and eyelids—as this occurs.

Treatment of Burns in Areas which should not be Tanned

After cleansing the burn area in the manner described above, the surface is dried and dusted with sulphanilamide powder. A "tulle gras" dressing[2] is then applied, and this in turn is covered by six to eight layers of gauze wrung out in warm normal saline. The gauze must be kept moist by warm saline being dripped on it from time to time, and on no account must it be allowed to become dry. The tulle gras will enable the gauze dressings to be removed without causing pain or injury to the burn surface, provided they are kept moist; as a rule it is advisable for the first few days to change the gauze every three to four hours, the tulle gras being left undisturbed during this process. Twice a day at first, and subsequently according to the progress of the case, the tulle gras dressing is changed: where it is possible to immerse the affected part in a bath the tulle gras dressing is allowed to float off, which it does readily. In the case of the face or other parts for which a bath cannot be used, a gentle stream of saline greatly assists in the removal, which should be painless and not associated with bleeding. Where baths are used the limb can remain immersed for half an hour or more, the saline being kept warm throughout. Before applying a fresh dressing the unburned surface of the limb is dried and the burn area dusted with sulphanilamide powder.

Dressings must be carried out with full aseptic technique, and special care must be taken to ensure the surgical cleanliness of the arm and leg baths. An oil silk or jaconet bag or cover is of value in keeping the gauze moist in the case of the arms and legs, both while the patient is in bed and during transport. Where burns of the face are treated by saline packs a jaconet bib assists in keeping the patient and the bed dry.

All cases of severe burns likely to be followed by loss of function or disfigurement, or to require extensive grafting, should be transferred to a burn centre as soon as they are fit to travel.

[The memorandum concludes with detailed directions for preparing sterilized vaseline dressings, and "tulle gras," and the jaconet bib.]

[1] It is hoped that in the near future a non-greasy substitute will be available for use instead of vaseline.

[2] Tulle gras may be prepared in the following way: Curtain net with a mesh of 2 mm. is cut into pieces 9 cm. square: these are placed in a tin box of slightly larger size, and the box is filled with a mixture of soft paraffin 56 grammes and balsam of Peru 2 grammes, sufficient to impregnate and cover the material completely after sterilization by heat in an autoclave.

The annual report of the Ling Physical Education Association shows an increase of membership and continued activity. There is little unemployment in the profession: on the contrary, many new opportunities for teachers of physical training are available. The work of members in educational and recreative physical training in reception and evacuation areas, in the Services, and in social welfare shows the value of the training in the physical training colleges and the importance attached to physical education in wartime as in peace. Among the association's publications, the pamphlet "Ventilation in Blacked-out Halls" has been in great demand. A special panel is now engaged in compiling "A Modern Approach to Health Education," to be published by the University of London Press. The report states that last year a resolution was forwarded to the Board of Education by the Ling Physical Education Association Committee recommending that more attention be paid to the teaching of hygiene in schools. The resolution was supported by the British Medical Association, the Association of Headmistresses, the National Council of Women, and the Federation of Women's Institutes.

Reports of Societies

PROBLEMS OF WAR CASUALTIES

At a meeting of the Liverpool Medical Institution on March 6, with the President, Prof. O. HERBERT WILLIAMS, in the chair, Dr. WILLIAM JOHNSON and Prof. T. P. MCMURRAY opened a discussion on major medical and surgical problems of war casualties.

War Neuroses

In opening the discussion on war neuroses, Dr. Johnson remarked that in anticipation of cases occurring among civilians as a result of air raids an E.M.S. Centre was opened early on in the present war. A scheme was drawn up, and instructions were circulated by Mr. Monsarrat, Group Officer, to first-aid posts and receiving hospitals, with suggestions for dealing with patients in order to limit the number admitted to the centre. But experience in this area had shown a dearth of civilian cases, and not a single one had been admitted to the centre. This experience was very similar to that in other centres. After the evacuation of Dunkirk a group of patients was admitted comprising types similar to those admitted to a centre in France during the battle of Passchendaele. The majority of cases, however, admitted to the centre in the past eighteen months were soldiers who had not served outside this country. Some were Army misfits, others needed grading into lower categories, and some after treatment were fit to return to their units. With regard to the latter a follow-up system was being carried out. Those whom it was found necessary to board out of the Army were chiefly among the misfits and men who had suffered from neuroses in civil life.

In regard to treatment the hospital atmosphere was so far as possible excluded. Very few patients were kept in bed, and a routine programme was in operation which ensured that patients were occupied through the day. Physical training instructors, occupational therapists, and instructors from N.C.O. patients had been appointed. Carpentry, basket work, raffia work, weaving, squad drill, route marches, games, and talks on military subjects were part of the programme.

Dr. F. HOPKINS referred to the controversy in the medical press some months ago on the subject of treatment at "neurosis centres," the point at issue being whether patients should have the benefit of the highly specialized forms of treatment of modern medical psychology or whether the archaic "neurological" methods in use before the last war should still be followed. The real issue in this discussion was whether patients as a whole should be treated from the standpoint of one particular school of medical psychology—namely, the psycho-analytic—or whether they should be dealt with by more flexible and practical methods of applied psychology. While the choice and carrying out of psychological treatment was important, it formed but one of the functions of the psychiatrist, and the task of diagnosis, prognosis, and disposal was equally important, only a relatively small proportion of patients requiring or being able to benefit by anything other than the more superficial kinds of treatment. A most difficult problem was that of the disposal of the man who, though his disability might be slight, was unlikely to be a satisfactory soldier on account of personality type and attitude to service, but who might be an adequate civilian worker.

Dr. S. BARTON HALL directed his remarks to two main questions—namely, neurosis in the Army as compared with that encountered in the civilian population, and the continued admission of mentally defective persons into the Army. With regard to the former, he considered it important to determine as early as possible the man's fundamental attitude towards service as distinct from that outwardly expressed, as thereby much unnecessary effort, waste of therapeutic skill, inefficient service, friction in the military machine, not to speak of expenditure of public money, might be saved. In a series of 150 consecutive cases investigated, few of which were acute, the attitude towards service was at the outset found to be unsatisfactory in approximately half (76). Of these, only two men could be rehabilitated to a degree sufficient to enable their return to their unit. On the other hand, of twenty-four patients in whom attitude towards service was found to be satisfactory, twenty-one returned to their unit with, it was felt, in many cases an excellent prospect of rendering further useful work. Dr. Barton Hall commented on the proportion among those whose attitude was unsatisfactory of men, often over the age of 40, who had previously served in the Army and, in a number of cases, had even been invalided out and pensioned during the war of 1914–18.

Of thirty-three soldiers referred for psychiatric investigation as out-patients eleven were found to be mentally defective, though previously unascertained, and in two more intellectual development was found to be so retarded as to incapacitate them for military training or service in any grade. The anomaly in the examination of recruits thus revealed was a matter of concern for the Army, and indicated a defect in the application of provisions for ascertainment of mental defect in the Education and Mental Deficiency Acts, and also in the system of medical education whereby a Board of medical men could pass individuals so handicapped as suitable for military service.

Dr. N. S. ALCOCK said that the essential in running a war neurosis centre was the combination of physical and mental management. In dealing with the purely physical handling of cases the initial interview of every patient on admission was most important. In this, the attitude of the patient was determined: first, whether he was a man who should or should not be allowed to mix with the other men in the centre; or whether, as in hysterical patients, symptoms must be removed before the man could join in the centre. Secondly, the question of occupation was discussed, both as to what the man could do to help in the occupational programme and what type of occupation would most benefit him. Lastly, he was allocated to his medical officer. Unless there was a fairly close approximation between the life in the centre and the life in the Army, the adaptation the men made in the centre might be of little help when they returned to their Army life.

War Surgery

In opening the discussion on surgical problems Prof. T. P. MCMURRAY said that the outstanding feature of the surgery of the present war, as compared with that of the last, was the almost complete disappearance of the ward dressing trolley and the ward gas apparatus. The appalling pain caused by the daily, or twice daily, dressings had gone, and in its place was the modern technique of excision and fixation. Fixation was practically always by plaster-of-Paris, although in the wounds of the thigh in fat women complete fixation by this means was an extreme difficulty. An addition to the technique was the use of sulphanilamide by packs or in powdered form, or by insufflation on the surface of the wound; although the use of sulphanilamide had helped to prevent sepsis in some cases which had not come for operation for four to eight hours after the infliction of the wound, nothing could replace the perfect excision of the wound, which was the essential point in the treatment. Nothing was so criminal as to suggest that the excision could be done badly so long as sulphanilamide was used. The main problems met with now were shock, for which fortunately the treatment was almost standardized; the prevention of sepsis, which depended largely on the excision of infected and dead tissues and the wide opening-up of tissues which had become infected; and fractures of the pelvis, which had occurred more frequently than normal owing to the falling in of bombed houses. In many of these cases of fractured pelvis there was a rupture of the urethra, and it would be well if agreement could be reached on the ideal treatment of this complication. Were the patients with a ruptured urethra to be treated with a catheter in position, or were they to be treated by suprapubic cystotomy; and what were the advantages of each?

A warning should also be given to those who without experience used plaster-of-Paris. This was a safe method of treatment so long as it was applied smoothly and without pressure, but if skin-tight plaster was applied on a limb, then the patient should not be transferred from the hospital for at least forty-eight hours. During that time any abnormal

point of pressure could be diagnosed and the pressure relieved, but if the patient was allowed to leave and go home or to another hospital soon after the application of the plaster, tragedies might happen.

The PRESIDENT said that in considering rupture of the urethra it was necessary to differentiate between the intrapelvic and extrapelvic varieties. In the former the urine escaped into the pelvic cellular tissue behind the triangular ligament; whereas in the latter the escape was into the tissue of the perineum in front of the triangular ligament. It was the intrapelvic variety that occurred usually in cases of fractured pelvis. To establish the diagnosis of such a rupture it would be necessary to pass a catheter. This should be done with the greatest care and gentleness, for more likely than not the tip of the instrument would pass through the rupture into the pelvic cellular tissue—this would tend to spread infection. Even if the catheter did pass beyond the rupture into the bladder drainage would be inadequate; urine could still pass along the outside of the catheter and further infect the periurethral tissue. In view of these considerations, therefore, it would appear that immediate suprapubic cystotomy and suction drainage was the rational line of treatment to follow in these cases.

The speaker differed from Prof. McMurray when he placed bipp in the same category as the sulphonamides in the treatment of wounds. Bipp was an antiseptic—a protoplasmic poison—and therefore had no place in the treatment of fresh wounds. The sulphonamides, on the other hand, were not protoplasmic poisons. Recent work showed that these drugs could be inserted into the tissue and even into the peritoneal cavity without causing any appreciable tissue reaction: even skin grafts would grow on a surface that had been sprinkled with sulphonamides. Their role was purely bacteriostatic, and they did not interfere with the natural defensive tissue reaction.

Mr. F. RONALD EDWARDS said that in many cases plasma was still not being used in sufficient quantities, and a rapid increase in the blood volume was necessary in some severe cases of shock. This could only be obtained by forced plasma administration with multiple cannulae. Oxygen therapy by the B.L.B. mask in shock was sadly neglected, and this addition might turn the tables in a desperate case. The use of desoxycorticosterone should be given a fuller clinical trial in shock. There appeared to be considerable difference of opinion as to how and when to give sulphonamides in cases of war injuries. There were certain wounds which could not be satisfactorily excised without producing a deformity out of all proportion to the original injury. Many wounds came into close relation to important vessels and nerves which could not be excised and which were still potentially infected. There appeared to be a definite inhibitory effect on anaerobic infection, and for these reasons sulphonamides should be inserted into the primarily excised wound. With already grossly infected wounds sulphanilamide placed in the wound would tend to be washed away by the discharge, and it was better to administer it by mouth or intramuscularly, so that the organisms deep in the wounded area would receive the drug via the blood stream. If possible, estimation of the concentration in the blood should be done, a value of 10 to 15 mg. per 100 c.cm. being maintained. The incidence of gas gangrene was low—0.5% in the area, with a mortality rate of 40%. Tetanus had not been seen.

Concerning perforating abdominal wounds, patients with involvement of solid viscera only as a whole did well, but in patients with perforation of the alimentary canal there was a mortality rate of over 90% in those submitted to operation. These patients died from shock, not peritoneal infection, and much further work was needed to investigate the action of sulphonamides in the peritoneal cavity to stay infection, so that if possible the shocked state might be more efficiently treated before these people were operated on.

Miss Anna Freud, daughter of the late Prof. Freud, has opened a clinic in Hampstead for mothers and babies who are suffering in mind and body from air raids. Treatment is free and patients are kept at the clinic until they are cured. A doctor is in attendance night and day, and there is a staff of trained nurses.

Correspondence

Crush Injuries

SIR,—The accounts of the crush injuries with renal failure (March 22) indicate that want of oxygen is an important factor, and that the inhalation of oxygen should be a method of treatment, this to be given, if possible, before release from confinement by debris, as well as after. Radiant heat given by means of a cradle and incandescent lamps should, I think, also be given. The circulation of the blood is kept up not only by the force of the heart, but by the tone not only of the muscles but of all the living cells, which, confined by skin and membranes, support the capillaries by their normal turgescence. Hence the firmness of the healthy body, which is diminished or lost in shock. Every muscular movement and change of posture furthers the circulation, and these effects are lost by fixation of the body under debris, while by pressure some parts may be rendered bloodless. Oxygen inhalation will lessen the damage caused by the deficient circulation.—I am, etc.,

St. John Clinic, S.W.1, March 23. LEONARD HILL.

SIR,—The series of cases of crush injuries with impaired renal function reported in the *Journal* of March 22 calls for comment in relation to the nursing of the severely injured.

Crush injuries are not new. They are commonly seen on the coalfield, where the treatment is careful nursing and non-interference rather than physiological and biochemical assay.

The case of fatal uraemia in a girl of 11 years reported by Mayon-White and Solandt suggests nephritis. The other cases from the Postgraduate School suggest a syndrome which might be dubbed the "continuous interference syndrome." Not only had the patients been subjected to readings of pulse, diastolic and systolic blood pressure, estimations of haemoglobin, oscillometric readings of leg volume in already injured right and left legs, radiographic examination, electrocardiographic examination, but even to catheterization—which in itself may give rise to shock. The repeated examinations for so-called blood chemistry and urine chemistry give a picture of the extent to which rest was allowed to figure in the treatment. The main objection, however, is to the volumes of fluid injected either in the form of blood, serum, plasma, or normal glucose-saline. In several cases the volume injected was equal to the blood volume of the patient. In one case 100 c.cm. of 30% saline was injected; in another 400 c.cm. of serum of quadruple strength. The patient complaining of thirst was given 200 c.cm. of 50% sucrose. Another, with an increasing chloride content, was subject to drastic reduction of chlorides by sweating, purgation, and replacement of gastric juice by sodium bicarbonate.

Haemorrhages in the newborn are frequent, either subtentorial, post-hepatic, or suprarenal. The haemorrhage under the scalp associated with caput succedaneum is almost a normal feature of childbirth. Most of these cases do well with peace, quiet, rest, and non-interference. The jaundice and occasional uric acid infarct of the kidney clear up. The uric acid infarct is rarely seen post mortem in the case of the stillborn, but is seen frequently in the case of the babe who succumbs soon after birth in the neonatal period.

Might I suggest that the system which works for haemorrhage and shock in the newborn be tried for traumatic shock? At birth the mammal has learnt to survive a series of shocks which involve the circulation, the respiratory system, the urogenital system, and the skin. We require not only charts of blood chemistry and urine analysis, but something which will be as effective to the injured as colostrum is to the newborn mammal. "Poor Tom's a-cold."—I am, etc.,

H. A. HARRIS.
Professor of Anatomy.

University of Cambridge, March 24.

SIR,—The interesting observations of Drs. Bywaters and Beall on cases of renal failure following prolonged burial under debris raise two points of interest and minor criticism.

First, as the surgeons in charge of the cases cited, we feel that the characteristic clinical picture has not been sufficiently emphasized. These cases on admission did not suggest grave

surgical emergencies. On the contrary, the primary injuries usually appeared trifling, the wheals, oedema, and interference with the local arterial circulation being the only gross signs of the ordeal to which the patients had been subjected. This absence of gross trauma, as pointed out in a previous letter to your *Journal* (September 28, 1940, p. 432), led the surgeon to feel that the cases would probably have a favourable outcome. Within a few hours, however, the whole clinical picture had changed dramatically. Signs of peripheral circulatory failure rapidly appeared, with pallor, sweating, and coldness of the extremities. Coincidently the blood pressure fell, and haemoconcentration was noted. At this stage the picture was one of traumatic shock, and when a good response followed transfusion the surgeon was again tempted to feel that the outlook was good. The response was, however, only temporary, and the sign that we soon learned to dread made its appearance—namely, a steadily progressing oliguria. Thereafter the clinical picture resembled in many respects that seen in renal failure in prostatic enlargement, and has proved, up to the present, as difficult to treat.

These three phases—a comparatively good condition on admission, a delayed peripheral circulatory failure which responds to transfusion, and finally progressive renal failure—make up a typical clinical picture which should be widely known.

Secondly, the use of the word "crush" is not in our submission desirable—suggesting as it does massive destruction of bone and muscle such as is seen in industrial accidents. In effect, in the severe crushing injuries, such as multiple compound fractures, which we have dealt with in this hospital we have not seen a case of renal failure. On the other hand, common to all the cases which developed renal failure in our series was a history of having been pinned for a prolonged period under debris. We therefore feel that the *duration* of the trauma is of great importance, and that probably ischaemia of the tissues distal to or immediately beneath the point of pressure by the debris is a contributing factor in the later developments. We would therefore suggest some such term as "pressure ischaemia" or "compression syndrome" as more suitable.—We are, etc.,

R. H. FRANKLIN.
D. M. DOUGLAS.
Surgeons, Sector VI, E.M.S.

London, March 25.

Cysticercal Epilepsy

SIR,—The case of cysticercal epilepsy reported by Dr. William Blyth in your issue of March 15 (p. 401) illustrates the importance of considering cysticercosis as a possible cause of epileptiform attacks commencing in a previously healthy adult after service or residence abroad. Unfortunately, however, there is at present no certain method of excluding this disease during life. The brain may be invaded, and the musculature remain free; and since intracerebral cysts usually do not calcify, radiographic examination of such cases is likely to be negative. Even when the muscles are invaded, the parasites may lodge too deeply for detection; or if very few in number none may happen to calcify, for all cysts do not go on to ultimate calcification.

Ideally every subject under suspicion should be examined each year, but this is a laborious and costly business, wearing to the patience of all parties. When such a procedure is possible, however, the longer the period during which re-examinations are carried out the more likely is a positive diagnosis to be forthcoming. A cyst which is flaccid and impalpable while the parasite is alive may become tense and swollen after its death, and so be easily perceptible to touch and possibly to sight. In one man whose symptoms of major epilepsy began in this country a year after leaving the Army, a cyst of this type appeared ten years after the onset of his symptoms. It was so obvious that no one could miss it. I had examined him carefully on at least twelve previous occasions over a period of years without detecting anything in the area affected. Another man who had been examined radiologically from head to foot no fewer than seven times over a period of ten years without result showed two calcifying cysts in the twelfth year of his disease. Nevertheless, whatever the duration of observation a large proportion of suspects will remain undiagnosed, although their history and symptoms are identical with those of others in the positive group, and a definite decision, one way or the other, can be obtained only by a post-mortem examination of the brain. Lately two men who had been examined for cysticercosis with negative findings came to post-mortem examination, not as the result of a follow-up—always difficult to ensure—but because death had resulted from other than natural causes. Both showed cysticerci in the brain; none was found elsewhere in the body. Again, fits may be attributed to some other cause on what seems good evidence. One man with an authenticated history of head injury while in the Army was investigated in a civil hospital by encephalography and other scientific measures. A firm diagnosis of traumatic epilepsy was made. These examinations, however, failed to disclose the presence of the fifty cysticerci which were counted post mortem in his brain four years later.

The following case history points the moral of my opening sentence. In May, 1936, when I was Commandant of the R.A.M. College, an ex-soldier clerk, employed in the library, asked to see me and told this story. The previous evening in a public-house he got into conversation with the bartender, and learned that he was an ex-soldier and had suffered from epilepsy for about six years past. The attacks had begun after he left the Army. He was undergoing a course of sedative treatment prescribed in the neurological department of a London hospital. The clerk asked if he had ever noticed any little lumps under his skin. The man replied: "Yes, I have three or four now." "Well," said the clerk, "you haven't got epilepsy at all; you've got cysticercosis." I examined the man a few days later and confirmed this spot diagnosis. I learned that besides attending the hospital mentioned he had been in the care of several doctors, and had also been in the wards of another London teaching hospital, where he was brought by ambulance, having been picked up in the street unconscious after a fit. According to the man's statement, the "little lumps" had been present during all this time. The ex-soldier clerk thought of cysticercosis; the professional practitioners did not. "*Ex ore infantium et lactantium* . . ."!—I am, etc.,

W. P. MACARTHUR.

London, March 20.

Treatment of Rectal Carcinoma

SIR,—There are a number of points raised in Dr. Ff. Roberts's article on the *x*-ray treatment of inoperable carcinoma of the rectum without colostomy (March 8, p. 357) which require discussion. While recognizing that exceptions occur in cases of high-grade malignancy and in cases of early venous spread, I agree with his statement of the slow rate of growth in rectal cancer, and the absence of distant metastases until a late stage of the disease has been reached. It is for these reasons that *a high proportion are found to be operable* when they are approached surgically (that is, explored) under the best conditions of team-work and pre- and post-operative management. For instance, out of 104 new cases of rectal cancer admitted into St. Mark's Hospital during 1940, 76, or 73.1%, were locally operable, although three of these cases were found to have small secondary deposits in the liver at the time of operation.

It would be pertinent to inquire by what standards Dr. Roberts judged his cases to be inoperable. My own experience is that one rarely meets with a case which is frankly inoperable locally in which distant metastases have not taken place. A good proportion of those which are classified on a clinical basis as of border-line operability prove on abdominal exploration to be operable, especially in male subjects. If laparotomy is denied to these cases many potentially operable cases will be missed.

If the discussion is limited to the large inoperable carcinomas of the *rectal ampulla* in which discharge is profuse and obstruction absent, then I would agree that there is a fair reason for giving *x*-ray therapy without colostomy unless some local complication such as a recto-vaginal fistula has developed. About 70% of cases occur, however, in the *upper* third of the rectum, where obstructive symptoms are likely to be prominent and important. A laparotomy is the only method of determining whether such cases are operable or not; if inoperable, I think a colostomy is the right treatment, which can be supplemented later by intraluminary radium or by *x* rays.

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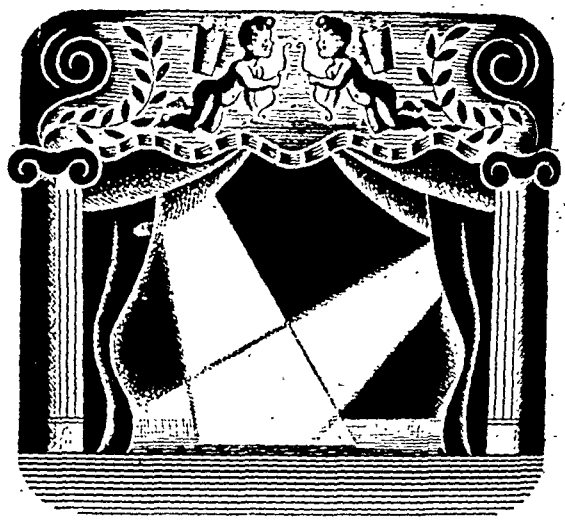
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'enter a doctor'

(MACBETH, ACT IV, SCENE III)

What is "a doctor"? Can the different personalities, interests and opinions which go to make the medical profession be harmonised and represented by a type? Lacking the courage of Shakespeare we leave our stage empty. We do, however, believe that the following statements are true of any doctor engaged in general practice:

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(2) He has cases every day in his practice which would benefit from one or other of the drugs listed below:—

* **DAGENAN—M & B 693** * *For pneumococcal, gonococcal, and meningococcal infections.*

* **THIAZAMIDE** *For cases which prove intolerant to* **M & B 693.**

* **SOLUSEPTASINE** *For parenteral administration in streptococcal infections.*

* **SONERYL** *For insomnia.*

* **GARDENAL** *For epilepsy.*

* **PROSEPTASINE** *For oral administration in streptococcal infections.*

* **SOLUSEPTASINE OINTMENT** *For topical application in bacterial skin infections.*

* **SONALGIN** *For insomnia associated with pain.*

* **RUTONAL** *For epilepsy.*

* **MYOCRISIN** *For rheumatoid arthritis.*

* **THEOGARDENAL** *For high blood pressure.*

* **S.V.C.** *For Trichomonal vaginitis.*

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if thought advisable. For inoperable carcinoma of the *lower* rectum involving the anal canal a colostomy is surely a desirable and necessary palliative operation for minimizing anal pain, and for relief of difficulty in defaecation or faecal incontinence.

As regards operative mortality, Dr. Roberts quotes from the paper which I wrote jointly with my colleague Mr. O. V. Lloyd-Davies in 1935 on a series of cases admitted to St. Mark's Hospital during the preceding twenty-four years. A mortality of 13.4% in 500 palliative colostomies was reported, but the post-script showed that by improved methods of anaesthesia and technique the mortality could be lowered to 5% (in forty-one operations). This figure has since then been almost maintained: during the last five years out of 201 colostomy operations for inoperable rectal cancer there have been 12 deaths (6%). Most of these deaths occurred in aged subjects, many of whom had intestinal obstruction, and were due principally to cardiac failure, uraemia, and coronary or cerebral thrombosis.

The four case reports given by Dr. Roberts are extremely interesting. To complete them one would welcome some information as to the results of abdominal examination and of digital and sigmoidoscopic examination of the rectum at the present time. Was a biopsy done originally? It would be instructive to know which grade of carcinoma has responded best to the technique employed.—I am, etc.,

London, W.1, March 25. W. B. GABRIEL.

Clinical Cancer Research

SIR,—In commenting on the annual report of the British Empire Cancer Campaign in your issue of March 1 (p. 329) you remark that in the report of the Clinical Cancer Research Committee there is no indication of the survival time of 2,915 cases living, out of 7,872 cases registered in 1938. We regret that no indication was given in the heading of this table that the figures represent the number of patients still living one year from the date of commencing treatment, or being seen at hospital in the case of those not treated. The average survival time of cases fatal within one year or less has been worked out separately for each region of the body; the present report includes that for the breast cases (45.8 months). This survival time will be worked out year by year, and it is hoped, when sufficient time has elapsed, to use it as a check on the results of treatment. Shortage of paper has not only prevented the publication of the figures for other regions, but has also necessitated the omission of a description of the method of coding and tabulation in these successive annual reports, though we recognize that it is desirable that readers in search of this information should not have to refer to previous reports.—We are, etc.,

HORDER
(Chairman)
W. L. HARNETT
(Medical Secretary)
Clinical Cancer Research Committee,
March 19. British Empire Cancer Campaign.

Resuscitation after Wound Shock

SIR,—The resuscitation of patients suffering from the severe degree of wound shock encountered in air-raid casualties has rightly invoked much discussion. The solution of the problem is considerably hastened by the publication of individual experiences such as those of Dr. Margaret Ball and Mr. George Quist (February 22, p. 273). These writers summarize their conclusions under five headings. Most of us will agree with their observations on the misuse of tourniquets, the economy of radiography, the necessity for the thorough excision of wounds, the adoption of a closed-plaster technique, and, finally, the ever-present danger of gas gangrene. On the other hand, the conclusion that the results of treatment of severe shock in these cases by fluid replacement with blood or plasma were disappointing is open to criticism.

In the first series of cases it is noted that most of the injuries were due to the direct action of the explosive. Here perhaps is a partial explanation for the failure to resuscitate these patients. Is it not likely that at necropsy these individuals would have shown lesions in the lungs and central nervous system which might account for the progressive deterioration despite the usual measures? I am presuming that necropsies were not done, as such are not recorded in the article. The rather pessimistic findings of the writers have not been supported by others in apparently similar series of cases. I do not suggest that the writers have implied that they are going to give up the use of blood or plasma in the very grave case, but I do consider that their observations might prove discouraging to others.

In the stress of air raids and the probable disorganization in hospitals it may not be easy to have necropsies performed. There must be, however, some opportunity to perform them in the type of case where there is no response to active resuscitation but where the local apparent injury does not seem too severe to obviate recovery. A plea is therefore advanced for early reports of complete post-mortem findings in the latter group of cases. Until these are available it will continue to be difficult to assess clinically the general visceral trauma present and so give "an accurate prognosis as regards immediate mortality."

I would be interested to know if lung changes, demonstrable radiologically, can be observed in the first hour or so after injury. If so, would these chest lesions provide a prognostic guide as to the central nervous system and other general lesions of blast? Limitations of the supply of blood, serum, or plasma demand that some real attempt should be made to define the "hopeless case"—if such exists!—I am, etc.,

JOHN A. SHEPHERD,
March 6. Surg. Lieut.-Commander, R.N.V.R.

Cut Tendons

SIR,—In connexion with Mr. H. Blacow Yates's letter (March 15, p. 417) I would suggest that before the finger which had its flexor tendons cut is, as a routine measure, thrown to the dogs, a thorough attempt should be made to restore function of the sutured tendons by the use of "amnioplastin," which, so far as I am aware, has not been given a fair trial in this kind of surgery.—I am, etc.,

Huddersfield, March 21. P. KOHNSTAMM.

Control of Catarrhal Infections

SIR,—The article by Surgeon Lieutenant R. Ernest King, R.N.V.R. (February 1, p. 154) prompts me to record a similar experiment which has been carried out during the present winter on board one of H.M. ships.

In November, 1940, coinciding with the return of a number of the ship's company from leave, several ratings reported with symptoms of the "common cold"—that is, slight sore throat, headache, and coryza, with little or no constitutional disturbance. As the first cases to report were confined to ratings from two mess-decks it was decided to attempt to limit the spread of infection among the rest of the ship's company by means of routine throat sprays and gargles. The ratings placed under observation were selected according to their disposition into different messes, so that each treated group was adjacent to an untreated group and shared the same living and working spaces, eight messes being chosen for this purpose. The numbers of the ratings in separate groups were unequal owing to the variation in size of the different messes.

The two messes already infected, together with two so far uninfected messes, were used as controls and received no treatment. Four other uninfected messes were selected for treatment, and the ratings were instructed to report to the sick bay every morning and evening on going off watch. Two of the latter groups were given gargles of pot. chlor. and ac. carbolic., one group received a throat spray of 10% potassium chlorate solution, while the fourth group was given a throat spray of 1 in 10,000 potassium permanganate solution. The members of all eight groups were instructed to report as soon as any symptoms of a sore throat or "common cold" made their appearance. This routine has been carried out for eleven weeks, and the following results have so far been obtained:

	Treated	Untreated
Total number under observation	36	58
Cases on sick list	0	2 (3.4%)
Cases on attending list	4 (11%)	12 (20%)

The sick list cases consisted of one "common cold" with frontal sinusitis, and one case of streptococcal tonsillitis. All

cases treated on the attending list were of the "common cold" type, beginning with dryness or soreness of the throat, followed by coryza and slight cough, with little or no rise of temperature. The four cases which occurred in the treated group had been treated with gargles only. No cases have so far occurred among those who have received the throat sprays.

This small series of cases indicates that a simple routine throat spray may be of value as a prophylactic measure against the normal winter incidence of upper respiratory infections, since it has been carried out during a period in which there has been no evidence of any widespread epidemic of these infections. Surgeon Lieutenant King's experiment has shown the undoubted value of such treatment in limiting the incidence of infection during the type of epidemic experienced in 1939–40.

This type of epidemic occurring in a closed community of relatively constant population, such as the complement of a warship, should be readily limited by routine prophylactic treatment combined with the prompt treatment of all cases showing even the mildest symptoms. A special look-out must be kept for such cases among newly joined personnel and in personnel returning from leave, in order to minimize the possibility of fresh infection. It has been noted during the past nine months that sporadic cases of throat infection have invariably occurred in ratings just returned from leave. Since leave is necessarily very limited under present conditions, the problem of fresh infection is somewhat minimized in a sea-going ship. This must, however, be a major problem in training establishments where there is a large moving population with a constant stream of new entries from different parts of the country, all of whom may be accompanied by their own varieties of viruses and cocci. The effects of this were seen during the "acute sore throat" epidemic of 1939–40, when a sharp rise in the number of cases admitted to hospital from shore establishments invariably coincided with week-end or other changes in the population.

The prevention and control of epidemics in the fighting Services appear simple in comparison with the problem as it affects the civilian population, so many of whom are now spending part of their lives in crowded air-raid shelters. The problems and peculiarities of the "shelter herd" have recently been summarized by Dr. W. H. Bradley.[1] In this article it is pointed out that many large shelters have developed a fairly constant population, the occupants of any one shelter tending to come from the same social, racial, or economic groups, with very little contact between the occupants of neighbouring shelters. In other words, each shelter has become a separate closed community, but differs from the other types of closed communities (for example, a large boarding school) in the fact that the population is dispersed during the daytime, often to widely separated districts, and congregates each night in the common incubator.

It is to the credit of the authorities that the winter has advanced so far without the occurrence of serious or widespread shelter epidemic. It is to be hoped that this satisfactory state of affairs does not lead to a feeling of complacency and cause us to forget the warning uttered by Prof. Greenwood (*British Medical Journal*, 1940, **2**, 677) or to neglect the more simple prophylactic measures. Since our present knowledge is still insufficient to make the universal use of the latest influenza vaccine a practicable measure, we must continue to try the simple methods which are readily available to everyone. If these simple methods succeed in limiting the common infections such as the sore throat and "common cold," then they might well be the first step towards the prevention of a disastrous epidemic similar to that of 1918.—I am, etc.,

J. W. RAE, M.B., Ch.B.,
Feb. 11. Surgeon Lieutenant, R.N.V.R.

Intramuscular Quinine for Malaria

SIR,—I was interested to read the letter from Dr. R. N. Hall (March 8, p. 380) advocating the intramuscular injection of quinine for malaria, for my experience in a mission hospital in Bihar, India, has convinced me that it is an economical and, with ordinary precautions, a safe method of treatment. After drawing up the solution into the syringe we used to wipe the needle carefully with the spirit swab which afterwards was used for purifying the skin. The site we used for injection was the outer aspect of the thigh in the upper part of the middle third. One could distinctly feel the needle pierce the fascia lata, and know that one was really giving the injection intramuscularly.

There is one point I have not seen stressed in the treatment of malaria, and that is the importance of timing the administration of quinine—whether it is given by injection or by mouth. I believe this to be most important, and from experience I found that the most effective time to give quinine by injection was one hour to half an hour before the temperature started to rise. By intramuscular injection the quinine attains its maximum concentration in the blood rapidly, and one's aim should be to get this maximum concentration at the time when the merozoites are scattered into the blood stream. This is shown clinically by the sudden rise of temperature. It is little use to give a 5-grain injection of quinine in the morning if the patient's temperature is not due to rise till the evening, for by that time the concentration in the blood is too weak to be lethal to the merozoites. It is also bad practice to give the injection when the patient's temperature has already risen, as not only does this add to the patient's discomfort, which from the fever is already considerable, but it also has little effect, as by the time the concentration in the blood has risen sufficiently the merozoites are safely sheltered in their new red-cell homes. We found that a single timed injection was usually sufficient to knock out an attack. Even when given by mouth we found the administration of quinine was more effective if given with reference to the temperature chart, but in this case one to one and a half hours was found to be the best time to allow before the expected rise.

The case which finally convinced me of the importance of timing the administration of quinine is, I think, worth reporting. The patient, a doctor, had had a severe attack of blackwater fever. During convalescence she had a slight rise of temperature (99.6° to 100° F.) twice in a day, at about 10 a.m. and 6 p.m., on alternate days. I was at first puzzled by this double rise, but then realized that it might be due to a double infection, one cycle causing the morning and the other the evening rise. On account of the blackwater it was important to give the minimum of quinine, so I gave none by mouth, but had the temperature charted every half-hour and gave a small timed injection of quinine before the morning pyrexia. This prevented the morning rise, but that evening the temperature rose as before. Two days later a second injection given half an hour before the temperature was due to start to rise in the evening knocked that out also, and the rest of the convalescence was apyrexial.

Dr. Hall states that "three daily intramuscular injections of quinine grains 5 are found to cure the acute symptoms." I hope he will try one timed injection and see whether it is not equally effective.

Should the experience of others be the same as my own, a large amount of quinine can be saved, and our patients will be spared some of the very real unpleasant effects which are the result of the "heroic" doses of quinine still sometimes administered.—I am, etc.,

Yeovil, Somerset, March 12. KINGSLEY E. D. DAUNCEY.

Cyclical Mucosal Ulceration

SIR,—The report by Dr. Pappworth of eight cases of cyclical mucosal ulceration in your issue of February 22 (p. 271) contains many points of great interest. I do not wish to go into detail as to a possible difference between ulcus vulvae acutum and those of the author's cases in which a hereditary factor is apparent, but I would point out that if the disorder is clearly associated with menstruation it might be classified among the menstrual molimina. In many cases these are refractory to endocrine treatment, but when looked at as allergic manifestations there seem to be better prospects of a cure. Thus, Gèber (*Brit. J. Derm. Syph.*, 1939, **51**, 265) reports that he achieves remarkable successes in these intractable disorders with injections of serum taken during the menses and applied intradermally daily or every second day. Although Pappworth mentions no allergic symptoms in his cases except angioneurotic oedema once, the very heredity of the symptoms suggests the possibility of allergy as an underlying cause.—I am, etc.,

B. BANETH, M.D.
London, N.W.2, March 8.

[1] *Practitioner*, January, 1941, p. 38.

Agranulocytosis after Sulphapyridine

SIR,—May I be permitted to suggest that Dr. Dywien's contribution to the toxicology of sulphapyridine (March 22, p. 456) would be far more valuable if he were to record the total dosage of the drug employed. He records his case as one of fatal agranulocytosis following only a short course of treatment with sulphapyridine, but he mentions the fact that the man had had a fortnight's course terminating only a week before and subsequently received further dosages. It is surely now generally agreed that the time factor is of less importance than the total dosage employed, and it would seem as though the inhibitory effect of the drug on the leucopoietic process wears off very slowly.

It would be a pity if such a valuable drug were to fall into disrepute through being represented as more toxic than in fact it is. The case quoted serves to emphasize not the danger of a short course of sulphapyridine but the danger of overdosage and of administering a second course within a short time after the initial treatment.—I am, etc.,

St. Mary Cray, Kent, March 21. BRIAN H. KIRMAN

Vitamin C and Skin Disorders

SIR,—The interesting letter from Dr. L. J. Picton (March 15, p. 420) concerning the value of raw greens prompts me to mention a recent experience concerning the excellent results of turnip juice in the treatment of bottle-fed infants suffering from acute papulo-erythematous eruptions.

The cases under review numbered three and their ages varied from 5 to 12 weeks, while the home conditions were of a low social standard. The mothers of those infants were unable to continue breast feeding once the bed was vacated and the household duties were resumed. Diluted cow's milk and white sugar was adopted as the most convenient substitute. The condition of the skin suggested a preliminary stage in the development of so-called "infantile eczema." The disappearance of rash and general improvement of the baby were noticed within one week of giving turnip juice on the lines suggested by Dr. Picton. The absence of fruit juices, and, indeed, the difficulty of procuring either honey or brown sugar as recommended, leave no option in regard to the use of ordinary white sugar. This is, of course, an objection, though I trust not a serious one.

In older children—from 2 years onwards—raw turnip is invaluable and is always relished by youthful palates which have not yet been perverted by excessive devitalized sugary food. Dr. Picton's interest and good work concerning the relationship between agriculture and health are worthy of the highest admiration and support.—I am, etc.,

Kilmacthomas, Co. Waterford, March 19. P. G. DOOLEY.

Vitamin B_1 in Diphtheria

SIR,—Drs. G. E. Donovan and M. Bannister (March 8, p. 359) present evidence against the value of vitamin B_1 in the complications of diphtheria. I would like to offer criticism of their paper, lest it be too rapidly assumed by those who have only time to read the summaries of papers that substantial proof is offered that the vitamin is valueless in diphtheritic heart failure. None of their "control" cases appear to have had heart failure at all. Of the test cases—that is, receiving the vitamin—three are recorded as having shown signs of failure. One of these (No. 12) received no vitamin for ten days after the appearance of symptoms of heart failure; another (No. 9) was treated from the day symptoms of heart failure appeared, but not for five days after the appearance of palatal palsy; both these recovered. The third (No. 7) is the only one recorded as having had gallop rhythm: it is not stated when symptoms of heart failure first appeared, or how long after treatment with the vitamin was begun death occurred. Treatment was not begun until the twenty-sixth day, but palatal palsy appeared on the fifteenth day.

I submit that these results are wholly inadequate as evidence on the subject, and that the usefulness of the vitamin in diphtheria and other toxic states should still be regarded as *sub judice*. I am interested in the subject as having recently seen two cases in young children not only with gallop rhythm but also with right ventricular failure (oedema, large and tender liver, scanty output of urine), both of whom made rather dramatic recoveries after subcutaneous injection of B_1. Other treatment was, of course, being administered: in one case gallop rhythm disappeared in the course of twenty-four hours and diuresis began almost immediately.—I am, etc.,

Edinburgh, March 21. DUNCAN LEYS, M.D.Oxon.

Vitamin K in Obstructive Jaundice

SIR,—Mr. M. J. Smyth (March 15, p. 417), in reply to my letter (February 22, p. 292) on vitamin K in obstructive jaundice, agrees with most of my statements. While supporting transfusion in cases resistant to vitamin K, he says that the increase in the prothrombin rarely exceeds 10 to 15%. This affirmation loses its value by neglecting to state the volume of blood employed.

He states further that blood is better than plasma and appears to assume that plasma must of necessity be stored. Actually, if fresh plasma is used, twice the amount of prothrombin is introduced for an equivalent volume of blood. Theoretically, the prothrombin of plasma (which has been isolated successfully) should be employed, but as it is unstable it is unlikely to be marketed.—I am, etc.,

Middlesbrough, March 17 R. N. HERSON.

Calcium Requirement

SIR,—I read with much interest Dr. J. P. McGowan's letter on calcium requirement (March 15, p. 421). I am definitely of the opinion that supplementing the dietary calcium with oral administration of calcium salts is not merely useless but can be positively harmful. Dr. McGowan states that certain calcium salts provoke osteoporosis. I entirely agree. It is only reasonable to suppose that the addition of calcium salts to the natural organic calcium of the normal diet precipitates the latter into relatively insoluble compounds which are eliminated by the bowel as sulphates, carbonates, etc.

The Craven district of Yorkshire is tolerably prosperous. It is essentially rural. Dairy produce, as well as mutton, pork, etc., are plentiful in normal times. It is a limestone country and the vegetation is rich in lime salts. The stocks benefit accordingly. Yet rickets is prevalent and dental caries rampant. I believe the secret is not the diet but the unusual hardness of the water. The incidence of lithiasis, renal as well as biliary, is remarkable. I have noticed similar tendencies in other districts where the water is unduly hard.

In the Island of Lewis rickets is unknown and the incidence of dental caries remarkably low. The diet is certainly wholesome with an adequate calcium ratio, but the water is very soft—so soft that a minimum of soap is required for washing purposes. But the normal diet of the Cravendale people can be scarcely less wholesome or less rich in calcium.

Water which is unduly hard by reason of lime in suspension or solution can actually be softened by the addition of more lime to form and precipitate lime salts. Unless I am mistaken, the wise people of Aberdeen had recourse to this dodge to soften the Dee water used in the Granite City. By the same analogy it is not unreasonable to think that natural calcium plus phosphate present in food and available and assimilable as such can be rendered insoluble and unavailable by the drinking of hard water.—I am, etc.,

Biggar, Lanarkshire, March 18. J. MACLEOD, M.D.

Malignant Measles?

SIR,—I have been much interested in the comments aroused by the note I made on the case diagnosed by me as "malignant" measles (March 8, p. 380).

Unfortunately the child was seen only once after the development of the rash and that at 2.0 a.m. in the poor light of a cottage. The child was already moribund and was disturbed as little as possible for purposes of examination. The parents did not wish a post-mortem examination to be made, and as I was not in doubt concerning the diagnosis of measles I did not insist, although for the purposes of discussion and finality it would obviously have been desirable.

Comment has been mainly focused on whether this case ought not to have been diagnosed as the Waterhouse-Friedrichsen syndrome or suprarenal haemorrhage. Clinically

the child presented the features characteristic of this condition —sudden onset, rapid fatal course with cyanosis, circulatory failure, and subcutaneous haemorrhages—and the point at issue is whether this syndrome was due to measles or to some other cause. Kunstadter (*Arch. Pediat.*, 1939, **56**, 489) estimates that 65 to 70% of cases in which bacteriological investigations have been made have been shown to be due to the meningococcus, but he points out that other infections have been mentioned as causative agents—among them measles.

In this district only one case of cerebrospinal meningitis has occurred during the last twelve months, and that was several months prior to the case under discussion. This latter was seen, however, during the height of an exceptionally widespread measles epidemic.

Whilst a morbilliform eruption can occur in suprarenal haemorrhage *not* due to measles (Grace, Harrison, and Davie, *Lancet*, July 27, 1940, p. 102) there is no reason to assume that measles is absent in the presence of a typical eruption even when this *is* accompanied by signs of suprarenal haemorrhage, unless some other organism is found to be responsible. Some of the recorded cases in which cultures have been made from blood and cerebrospinal fluid have yielded negative cultures (Sachs, *Ann. intern. Med.*, 1937, **10**, 1105).

With regard to Dr. G. P. Goodwin's comment (March 22, p. 462) that no mention was made of Koplik's spots or of the usual prodromata of measles, it is to be noted that the former disappear as the rash develops and are therefore not of value in a case like this unless they happen to have been looked for before any other suspicion of measles arose.

I agree with Dr. Price Williams (p. 462) that "blackness" does not necessarily imply malignancy, although in this case both terms were justified. In the present epidemic a typical case of morbilli bullosi was seen by a colleague. The course of the illness was prolonged for several days but ultimately reached a fatal conclusion. Another typical case of measles suddenly developed convulsions and went into a state of coma from which it did not recover. This may seem to be a high proportion of fatal cases for one district, but over three hundred cases have been notified this year, and this number could doubtless be increased by cases not seen by any doctor.—I am, etc.,

Tiverton, Devon, March 23. AUDREY Z. BAKER.

Hospitals Radon Centre

SIR,—As the result of a generous gift from the British War Relief Society of New York, further supplies of radon are now assured. The gift was made to the British Hospitals Association, who have asked the Middlesex Hospital to administer it. This new supply is intended for the use of hospitals throughout the country, and no distinction will be made between requisitions for paying and non-paying patients. It is hoped to increase the amount of radium in solution at this new centre when the demand warrants it.

In the first instance it will be necessary to charge all hospitals for supplies of radon, and it has been decided to charge for it at the lowest basic rates obtaining at the Medical Research Council Radon Centre—namely, one shilling a millicurie, with a reduction to sixpence a millicurie for any quantity in excess of fifty millicuries; the minimum charge for any radon requisition will be one guinea. It is hoped that in the near future some arrangement will be possible whereby the burden of such payments may be lightened. Applications for radon may now be sent to the Hospitals Radon Centre, c/o Barton Lime Co., Barton-in-the-Clay, Bedfordshire; telephone Hexton 210.—I am, etc.,

Middlesex Hospital, W.1, March 24. SIDNEY RUSS.

E. Wolff (*Arch. Pediat.*, 1941, **58**, 1), who records eight illustrative cases under the name of "buccal spots," describes a new sign in influenza and the common cold consisting in the appearance in 70% of the patients within the first three days of small white specks in the mid-area of the mucous membrane of the cheek, opposite the bite-line of the teeth. The author says that they are most frequently situated (1) between the anterior and middle thirds, (2) in the centre, and (3) between the middle and posterior thirds of the line. They are distinct from traumatic lesions, Koplik's spots, and aphthous stomatitis.

Obituary

Dr. ARTHUR DOUGLAS WEBSTER, O.B.E., died at his home in Mansionhouse Road, Edinburgh, on March 16, aged 85. A native of Nova Scotia, he graduated M.D., C.M. of McGill University in 1878, and, coming to Edinburgh soon afterwards, obtained the licence of the two Scottish colleges. He was admitted F.R.C.P.Ed. in 1884, took the B.Sc. of Edinburgh University in Public Health in 1888, and proceeded to the D.Sc. in 1900. Dr. Webster was a keen Volunteer in the years before the last war, serving in the ranks before he was gazetted to a commission as medical officer of the 4th Battalion Royal Scots (Queen's Edinburgh). On the outbreak of war in August, 1914, he offered his services and was appointed medical officer of the 1st Edinburgh Battalion (Kitchener's Army) 15th Royal Scots and attained the rank of Lieut.-Colonel R.A.M.C.(T.); for his military services he was awarded the Volunteer Decoration and the O.B.E. Dr. Webster, who had been a member of the British Medical Association for sixty-one years, was a Fellow of the Royal Physical Society of Edinburgh and the Obstetrical Society of Edinburgh, and an external member of the Royal Medical Society. He had long held the post of examiner of blind persons for the South-East District of Scotland. His eldest son is Dr. J. H. Douglas Webster, honorary director of the Meyerstein Institute of Radiotherapy, Middlesex Hospital.

Dr. WILFRED SCOVIL SODEN, who died suddenly on March 13 at Winchcombe, Gloucestershire, aged 52, received his medical education at Cambridge (St. John's College) and St. Bartholomew's Hospital. He graduated B.A. with honours in the Natural Sciences Tripos of 1910 and took the English Conjoint qualifications in 1913 and the M.B., B.Ch. degrees in 1920. From 1913 to 1915 he worked at the Metropolitan Hospital, first as house-physician and later as house-surgeon, and then as pathologist and registrar. He served in the last war with the rank of Captain, R.A.M.C.T., and was mentioned in dispatches, and after the armistice remained in Egypt and served for a time as examiner at the Cairo School of Medicine. It was during this period that he wrote his M.B. thesis on the work of a stationary hospital in Palestine. At Winchcombe, where he began practice in 1921, Dr. Soden was appointed medical officer and public vaccinator for the Vale District, and he became honorary surgeon to the Winchcombe Hospital, which he was largely instrumental in establishing in 1927. He had been a member of the British Medical Association for the past eighteen years. By his death Winchcombe and the surrounding countryside has suffered a great loss.

We regret to record the death by enemy action of Dr. HILDA BEATRICE GRINYER. She studied at the London School of Medicine for Women, taking the diplomas of M.R.C.S. and L.R.C.P. in December, 1938, and in February, 1940, was appointed house-surgeon at the Manchester Royal Eye Hospital, where she worked most assiduously until her untimely death during an air raid on Manchester. It was her custom during the "alert" periods to help in the carrying of children down to the shelter and to assist the patients in every way.

The sudden death occurred on March 21 of WILLIAM ADAMS CLARK at the age of 77. He graduated M.B.Lond. after his curriculum at St. Bartholomew's Hospital, and proceeded to the M.D. three years later. After holding several minor appointments he settled in 1895 in practice in Penge, where he died. Here he had a large area from which he drew patients, and he was greatly respected owing to his thoroughness in diagnosis and skill in treatment, and for his kindness to rich and poor alike. He was school medical officer for the Penge educational authority. Dr. Adams Clark was a staunch evangelical churchman, and much interested in the activities of the congregation of which he was a member. For many years he had been a member of the B.M.A. All three of his children—a son and two daughters—are following their father's profession. Some years ago he had a motor accident from which he did not appear ever to have fully recovered, but he died suddenly from myocardial degeneration.

Universities and Colleges

UNIVERSITY OF OXFORD

Election to Board of Faculty of Medicine

1 election of two members of the Board of the Faculty of edicine will be held on June 4. The members elected will me into office on the first day of Michaelmas Term, 1941. d will hold office, the senior for two years and the junior r one year from that day.

The General Medical Electorate consists of all Oxford aduates in medicine who are members of Convocation. ie Board of the Faculty of Medicine includes two members :cted by the general medical electorate who must be members that body and of whom one at least must be a person gaged in teaching one or more of the clinical subjects of the iculty.

Nominations of duly qualified candidates for election will received by the Secretary of Faculties at the University egistry up to 10 a.m. on May 14. Each nomination must signed by six members of the general medical electorate. id no candidate will be eligible whose nomination has not :en received by that date.

UNIVERSITY OF LONDON

ne degree of Ph.D. for internal students has been awarded Mary T. Franklin of the London School of Hygiene and ropical Medicine.

UNIVERSITY OF BRISTOL

M. Yoffey, M.D., F.R.C.S., has been appointed to the hair of Anatomy in the University in succession to Prof. E. Whitnall, who retires at the end of the current session.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

he following candidates have satisfied the examiners for the iploma of the College:

Marie H. Calverley, L. E. Cowan, Ursula M. Dick, Marjorie O. unster, D. S. Foster, R. R. Gordon, C. N. Gosse, Ruth M. owitt, Iola Ll. T. Jones, Agnes MacF. D. Milne, J. Overton. lary A. Rogerson, C. R. Sluming, Christine M. Stacey, Evelyn E. eed, Lucy M. Sutcliffe.

The Services

HONORARY SURGEON TO THE KING

ir Commodore Frank Cuninghame Cowtan, R.A.F., has been ppointed Honorary Surgeon to the King in succession to ir Marshal Sir Victor Richardson, K.B.E., C.B., R.A.F.

D.D.M.S. APPOINTMENT

olonel (Temporary Brigadier) O. W. McSheehy, D.S.O., .B.E., late R.A.M.C., has been appointed a Deputy Director f Medical Services and has been granted the acting rank f Major-General.

R.A.F. AWARDS AND MENTIONS IN DISPATCHES

The George Medal has been awarded to Flying Officer Kenneth Leopold George Nobbs.

One night in November, 1940, an aircraft caught fire in he air and crashed in the vicinity of an aerodrome. Flying Officer Nobbs hastened to the scene of the accident and, although the aircraft was burning fiercely and machine-gun bullets were flying in all directions, he at once entered the wreckage. He succeeded in pulling out the trapped air gunner, and after carrying him to a safe distance extinguished his burning clothing just before the petrol tanks exploded. Although the air gunner subsequently died of his injuries, Flying Officer Nobbs displayed the utmost courage and an entire disregard of danger in his efforts to save the air gunner's life.

Flight Lieut. David Anderson Smith, A.A.F., has been appointed an M.B.E. (*Military Division*) in recognition of distinguished services rendered in operational commands of the Royal Air Force.

Flight Lieuts. William Noel Whiteside and James Leonard Brown, R.A.F., and Flight Lieut. Edward Conrad Gross, A.A.F., have been mentioned in dispatches.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL ARMY MEDICAL CORPS

Captain THOMAS ELLIS MITCHELL died at Birmingham this month, aged 34. He was the only son of the late Dr. and Mrs. T. E. Mitchell of Old Hill, Staffs, and was educated at the University of Cambridge and Guy's Hospital, qualifying L.M.S.S.A. in 1933. Before the war he was in partnership with Dr. Hugh Stevenson at Old Hill.

Medical Notes in Parliament

Nursing Demands and Mobilization of Women

The mobilization and registration of women for war service were discussed in the House of Commons on March 20. Opening the debate for the Ministry of Labour, Mr. R. ASSHETON said that Mr. Bevin had appointed to help him in his work a committee of women, including Dr. Summerskill. Before this year was out there would be a demand for women to take the places of men in every occupation where it was possible for them to do so. There were also demands in the public health and nursing services. On April 19 all women born in 1920 would be registered and would soon be followed by the next older age group. All women, married or single, would have to register unless already in the women's services or in the nursing services attached to the armed Forces. The greatest care would be taken to avoid calling on women with young children. No woman who was pregnant would be called up compulsorily. It would be wise to obtain the services of unoccupied women in the older age groups before taking away women of 20 or 21 who were doing useful work. Registration would be followed by interviews, at which an important consideration would be the woman's health. It was not proposed that women should be examined by a medical board, but it would be possible for women to produce medical evidence of any infirmity or disability. The Ministry of Labour would be entitled to obtain an independent medical opinion.

Miss WARD asked Mr. Assheton to see whether justice was being done to nurses. A Division of Nursing in the Ministry of Health had been asked for, with people in charge who were qualified and experienced in the nursing world. Local authorities had been able to make arrangements about superannuation for nurses, but no voluntary hospital had been able to accept the responsibility of keeping up the payments. The War Office had not come to a decision with the Treasury to treat properly the nurses in the armed Forces of the Crown in regard to superannuation.

Viscountess DAVIDSON said that in a civilian hospital which would soon have some 1,500 beds, a large percentage of the domestic servants on the staff aged 20 or 21 left, within twenty-four hours of Mr. Bevin's speech on the conscription of women, to enlist in one of the three Forces, being convinced that compulsion would follow. She asked for an instruction that such women should not leave their present jobs until they were needed.

Miss HORSBRGH said the work done in the hospitals took second place to none in the country, whether it was domestic work or the work of nurses, doctors, or ambulance personnel. She thought the call to that service would be answered. The Civil Nursing Reserve had trained many thousands of women, but there had been difficulty with women who did not wish to leave their homes. Greater mobility was necessary because the fever hospitals and some of the special hospitals were not getting sufficient recruits. However, there had been a steady increase in the numbers coming in, but new recruits were wanted who would go anywhere and nurse everyone and would stay in one place until it was found that their services were more urgently needed elsewhere. Arrangements had now been made for a Nursing Division of the Ministry of Health. Difficulties associated with the superannuation could be overcome, but it was very difficult to do so in wartime. Women over 30 as nursing auxiliaries could obtain a short instruction in hospitals, and arrangements were being made for nursing training from now on of a more comprehensive character.

The Ministry hoped to form a Central Register for those who came into the nursing profession merely for the war or who hoped to work in that profession later. The Ministry would fix a minimum rate of salary during the war, and hospitals to which the probationers were sent from the Central Register would be required to pay this. She did not believe, now there were calls to women to work in munition factories, that the call for nurses would not be answered.

Dr. EDITH SUMMERSKILL said it was taken for granted that there would be no calling up of expectant mothers, but there would be expectant mothers in the factories. An employer committed an offence if he knowingly engaged a woman during the four weeks after childbirth, but could employ her right up to childbirth. The Midwives Institute and other organizations pressed for the Minister to issue an order making it an offence for a woman to be employed during the four weeks before confinement. The Minister should introduce a Regulation right away dealing with this matter. She asked the Minister also to consider allowing a nursing mother to have time to feed her baby at work.

Milk Supplies

In the House of Lords on March 18 Lord WOOLTON said the Government had decided that in these abnormal times it could not adopt the recommendations made by Lord Perry's Committee on the distribution of milk. By maintaining an unrestricted supply of milk to nursing and expectant mothers, to young children, and to children under the milk-in-schools scheme the Government would give priority to some 5,500,000 people. He was also arranging to secure the maintenance of milk supplies to hospitals and, under prescribed conditions, to certain types of people who were ill. The Ministry of Food, with the Health and Education Departments, had removed many of the difficulties which arose in the milk-in-schools scheme as a result of war and evacuation. He had decided to restrict the consumption of milk by the ordinary man and woman, and had asked dairymen to reduce from the middle of April their domestic sales by approximately one-seventh. He would require bakers and flour confectioners to dispense with milk and would continue the ban on the use of fresh cream, and that on the use of milk in making synthetic cream and ice-cream.

State Medical Service

Mr. GROVES asked whether the Minister of Health, in view of the fact that medical services directly or indirectly controlled by the Government embraced the armed Forces, the emergency medical and air-raid precautions services, medical benefit under the National Health Insurance Acts, public assistance, services in respect of factory workers, and medical officers of health, would consider instituting a State Medical Service to solve the problem of the distribution of medical man-power between the claims of the civilian population and the armed Forces. Mr. BROWN replied on March 25 that the present time was not opportune for considering this suggestion. Machinery for securing that the best use was made of the medical man-power available had been in existence since the beginning of the war.

Nursing Homes in Central London.—On March 19 Mr. LIDDALL asked whether the Minister of Health would, as part of reconstruction planning, arrange with the London County Council gradually to abolish the derelict houses in slum areas around the Baker Street district of Marylebone, which had been converted for use as private nursing homes, and to replan the whole private nursing home system and location in Central London. Miss HORSBRUGH answered that the needs of adequate medical services would be borne in mind in the plans for reconstruction of large areas, but it was too early to make any statement on the position of particular areas or particular services after the war.

Batteries for Hearing Aids.—Captain WATERHOUSE stated on March 20 that difficulty in securing batteries for use with electrical hearing apparatus was due to increasingly heavy Service demands for miniature cells. The problem of arranging for the use of other types of cell in hearing aids was being examined in consultation with the manufacturers. Meanwhile, supplies of miniature cells were being released.

Notes in Brief

The arrangements for the medical care of the Home Guard are under review. Mr. Groves, in asking about this, said that in many cases the Home Guard was setting up its own medical service.

No. 9

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 1, 1941.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included); (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941					1940 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	400	22	97	1	17	623	33	115	2	2
Deaths		3	7				9	12		
Diphtheria	1,014	50	334	25	34	767	42	256	61	30
Deaths	41	1	13	1	1	29	—	9	6	2
Dysentery	179	17	25	3	—	45	10	26	—	—
Deaths			—		—			—	—	—
Encephalitis lethargica, acute	4	2	2		—	7	1	—		—
Deaths		—					—	—		
Enteric (typhoid and paratyphoid) fever	18	—	1	6	—	11	3	2	7	2
Deaths	1	—	—	—	—	—	—	—	—	—
Erysipelas		2	52	4	—		—	55	7	5
Deaths								2		
Infective enteritis or diarrhoea under 2 years	40	2	12	2	1	33	3	7	7	3
Deaths										
Measles	15,334	325	159		23	4,535	65	112	—	241
Deaths	19	2	—	1	—	4	—	2		13
Ophthalmia neonatorum	87	7	12		—	87	7	37		—
Deaths										
Pneumonia, influenzal*	1,647	65	43	17	8	2,243	111	102	14	10
Deaths (from influenza)	267	20	15	6	10	512	41	48	21	26
Pneumonia, primary		—	458	23	19		95	395	29	29
Deaths				14				29	26	
Polio-encephalitis, acute	2	1				1	—			
Deaths		—					—			
Poliomyelitis, acute	11	—	1	—	—	9	—	—	—	—
Deaths		—	—				1	—		
Puerperal fever	1	1	13	1	—	8	8	15	4	—
Deaths							—			
Puerperal pyrexia	146	9	12		—	195	12	25		2
Deaths										
Relapsing fever	1	—			—	—	—			—
Deaths										
Scarlet fever	1,300	62	170	30	20	975	35	130	51	59
Deaths	—	—	—	—	—	—	—	—	—	1
Small-pox	—	—	—		—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	2	—	—	—	—	—	—
Deaths			—		—			—	—	—
Whooping-cough	3,248	67	690		17	571	18	21	2	21
Deaths	42	2	19	1	1	2	—	1		2
Deaths (0-1 year)	478	56	137	39	26	549	56	103	38	36
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	7,150	921	888	279	244	8,028	1,208	975	343	256
Annual death rate (per 1,000 persons living)			19.3	18.5	21.4			18.0	22.9	22.5
Live births	5,157	392	859	361	210	6,296	997	891	319	234
Annual rate per 1,000 persons living			17.4	24.0	18.4			18.0	21.3	20.6
Stillbirths	208	12	51			262	26	43		
Rate per 1,000 total births (including stillborn)			56.0					46		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

he commoner acute infectious diseases. scarlet fever and sles have slightly increased in incidence during the week. se two diseases, and also whooping-cough, have been tend- to increase in the last few weeks but with considerable uations from week to week. Although they are more alent than at the corresponding period of last year, the irregular rate of weekly increase suggests that large- epidemics are unlikely.

Cerebrospinal Fever

or the first time this year the number of notifications has pped, and experience shows that it is likely to decline her in the coming weeks, although not necessarily in ilar fashion. Despite the decrease in the notifications, number of administrative areas involved has risen during week from fifty to fifty-one; the following are most vily affected: Lancaster 54; Yorks. West Riding, 31; morgan 27; Warwick 23; London 22; Chester 18; ex 14; Middlesex 14; Stafford 14; Northumberland Devon 11; Surrey 10; Durham, Gloucester, Hertford, Kent 9 each; Somerset 8; Norfolk 7; Berks and South- ton 6 each. The details of the notifications in counties rding more than 12 in the week indicate that the disease videly scattered in each administrative area, probably affect- the rural and urban districts per head of population as ch as the county boroughs. For the week ending March 15 ifications amounted to 330.

n Scotland notifications rose from 70 to 97 and administra- areas involved rose from 23 to 26; the disease is preva- t in the counties of Ayr 7, Fife 5, Lanark 4, Moray and irn 4. Clackmannan 3, and the boroughs of Glasgow 32, nburgh 13, Kirkcaldy 4. Falkirk 3.

Dysentery

Although dysentery has fallen since last week it is more valent than usual, chiefly due to localized outbreaks of nsiderable magnitude in institutions. Over five-sixths of the al occurred in five administrative areas, the remaining een areas involved recording single or small numbers of ses only. The areas chiefly affected are Essex 52 (Colches- M.B. 48. Brentwood U.D. 4); Yorks. West Riding 31 ieffield 1, Wakefield 4, Aireborough U.D. 5, Goole M.B. 18, dsey M.B. and Shipley U.D. 1 each); Bedford 29, all in gleswade R.D.; Lancaster 23 (Manchester 14, Lancaster B. and Warrington 1 each, Blackburn R.D. 2, Whiston D. 5); London 17 (Wandsworth 10, and 1 each in Chelsea, lborn, Islington, Lewisham, Paddington, St. Marylebone, d Stepney). Details are available of the Goole outbreak, which 1 death has been recorded so far. Of 17 cases long the infirm inmates in one block of the county insti- ion one of the patients came from Wakefield, where two ses had previously been reported, but the source of the tbreak has been ascribed to two carriers of the disease, acuees from Hull and London respectively. For the week ding March 15, 146 cases of dysentery were notified.

In Scotland cases were recorded in the counties of Aberdeen Fife 3. Lanark 1, Renfrew 1, and the boroughs of Aber- en 2, Dundee 7, Edinburgh 5, Glasgow 1. At the time of ing to press there are reports of a widespread outbreak of ratyphoid B fever in the counties of Moray and Nairn, verness, and Ross, but no details are available as to source numbers affected.

Influenza for Week Ending March 15

In the week ending March 15, 132 deaths were ascribed influenza in the great towns, 67 fewer than in the previous eek. Of these deaths, 6.8% were at ages under 25 and 1.54% at ages over 65. In the County of London 15 deaths ere registered (13 in the previous week). The proportion of tal deaths coming from the South-Eastern Area was 28.36%. would appear that the winter epidemic is now over.

Medical News

The names of Dr. Mary Barrow of Birmingham and Dr. Andrew Campbell Clarke, Divisional Police Surgeon, Salford Police Force, have been brought to notice for brave conduct in civil defence.

Lord Horder will read a paper on "The Modern Troglodyte" before the Royal Society of Arts (John Adam Street, Adelphi, W.C.) on Wednesday, April 2, at 2.30 p.m., when Mr. Ernest Brown, Minister of Health, will preside.

At the next meeting of the Medical Society of London, to be held at 11, Chandos Street, Cavendish Square, W., on Monday, March 31, at 4.30 p.m., a discussion on "The Factors influencing the Healing of Wounds" will be introduced by Dr. John M. Converse from the U.S.A. and Mr. Alan H. Hunt.

The next meeting of the Shaftesbury Military Hospital Medical Society will be held at the hospital on Tuesday, April 1, at 3 p.m., when Lord Horder will deliver an address on "The Future of Medicine." An extraordinary meeting will take place on Saturday, March 29, at 3 p.m., at which a discussion on "The Dyspeptic in the Army" will be opened by Dr. Charles Newman and Mr. Reginald T. Payne.

At the next meeting of the Society of Public Analysts and Other Analytical Chemists, to be held at 4 p.m. on Wednesday, April 2, at the Chemical Society's Rooms, Burlington House, W.1, three papers will be presented and discussed, including two on the determination of arsenic in foodstuffs contaminated with arsenical war gases. Guests introduced by members are welcomed at the meetings by the council, but they are reminded that the proceedings are strictly private.

The United States National Foundation for Infantile Paralysis will hold a semi-annual meeting of its medical committees on May 15, when applications for grants for the study of the cause, prevention, and treatment of the disease will be considered.

According to *Nature* of March 8 the Swammerdam Medal for 1940 has been awarded to Prof. G. W. Grijne of Amsterdam, the Nestor of Dutch physiologists. The six previous recipients have been K. T. E. von Siebold (1880), Ernst Haeckel (1890), K. Gegenbaur and Hugo de Vries (1910), Max Weber (1920), and H. Spemani (1930).

The issue of *Science* for February 7 is devoted to reports of the recent Philadelphia meeting of the American Association for the Advancement of Science and associated societies. The programme of the medical section was entirely given up to human malaria.

At the half-yearly meeting of the executive committee of the Duke of Gloucester's Red Cross and St. John Fund it was announced that over £5,000,000 have been raised by voluntary contributions since the outbreak of war.

The American Academy of Arts and Sciences has awarded nearly 16,000 dollars to be divided equally among four scientists for their contributions to the treatment and care of genito-urinary diseases. The money comes from the Amory Foundation established in 1912. Three of the prizes go to Americans: Dr. Joseph F. McCarthy of New York, Dr. Carl Richard Moore of Chicago, and Dr. Hugh H. Young of Johns Hopkins. The fourth will go to a European scientist whose name will not be revealed at present.

Dr. John F. Fulton, Sterling professor of physiology at Yale University, has presented to the Yale Medical Library a collection of books and Government documents bearing on military medicine published in England since the beginning of the war.

Dr. Evarts A. Graham, Bisby professor of surgery, Washington University School of Medicine, St. Louis, Mo., has had conferred on him the honorary degree of doctor of science by the University of Pennsylvania.

Australia, which has the lowest infantile mortality in the world, has fitted out a children's sanitary train to provide help for mothers and children in out-of-the-way country districts.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be addressed to the Secretary.

TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London*; SECRETARY, *Mediscera Westcent, London*.

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Sjorgen's Syndrome

DR. MARGARET COLLS (Isle of Man) writes: I should be grateful for information on the above syndrome. Where can I find an account of it in the medical literature? I have a female patient aged 47 who for the past six years has suffered from complete absence of saliva, from dysphagia, extreme dryness of the skin, and alopecia necessitating the wearing of a wig. Her mouth is in a very unhealthy condition from gingivitis and bleeding of the gums. She has great difficulty in masticating her food. Mouth washes, ascorbic acid tablets, and an acid mixture before meals have been prescribed, but without much alleviation of her distressing condition. Can someone suggest further treatment?

Rose-hip Jelly and Wild Herbs

MISS GWENDOLINE BOWES (Grange-in-Borrowdale, Keswick) writes: I think that Dr. W. J. Burns Selkirk (March 15, p. 426) would find the following recipe for rose-hip jelly pleasing: Take the outside only of the rose-hips and press into an enamel pan, and just cover with water. Simmer until very soft and rub through a sieve. To each pound of pulp add 3/4 lb. of sugar and 2 oz. of preserved ginger. Boil until the jelly sets when tested. The above is taken from *The English Cookery Book*, by Lucie G. Nicholl, published by Faber and Faber. There is an excellent section "The Rambler's Harvest" giving many interesting country recipes. The old suggestion of cooking the fronds of young bracken—almost asparagus—may be raised again this year. Five of us made the experiment last, gathering with loving care, and cooking the greens until tender, serving with butter sauce. Never again: we were reminded of a very bitter dose of quinine. May I add that mustard and cress grown on blotting paper, kept moist, is very delicious, and, given seasonable sun, yields a quick result.

DR. E. SAKOSCHANSKY (Southampton) writes: Dr. Burns Selkirk inquires what book dealing with the use of wild herbs would be recommended. *Wild Foods of Britain*, by Jason Hill (Adam and Charles Black, London) is a veritable mine of information. Hill gives a recipe for making hawthorn jelly from hawthorn fruit (haws); he states that a jam is made in Scotland from wild rose hips, but gives no recipe, though he states that the hips of the wild rose are a commercial source of the anti-scorbutic vitamins, and he gives an interesting account of the use of the dandelion.

Herbs for Flavouring Food

DR. ROBERT BUXTON (Weston-super-Mare) writes: Two letters appeared in your issue of March 15 referring to the use of herbs for flavouring food which I read with interest, as I have a herb-garden. Vegetables will this year be more important than ever as part of the national diet. However, as a nation we are unenterprising in the way we cook them, in the few varieties we use, and in the neglect of herbs in all kinds of dishes. Herbs are easy to grow and provide a variety of flavours on the table and colours in the garden. Many herbs can be used in the kitchen, but only a few are necessary, the others being for the connoisseur. To anyone interested I would recommend buying in April the following herbs: balm, chives, tarragon, chervil, winter savory, borage. These are obtainable from Miss Eleanor Sinclair Rohde, Cranham Lodge, Reigate, Surrey, together with books on the subject written by her. Herbals are full of folk-lore and charm—for example: "If poisoned by your step-mother, drink horehound hot from the fire."

Income Tax

Medical Boards—Fees—Schedule E

"A. M." holds an appointment on a Medical Board, and being on the B.M.A. Ophthalmic List deals with cases referred by other Medical Boards. Are the fees from the latter work assessable under Schedule E?

*** Schedule E applies to "all salaries, fees, wages, perquisites or profits whatsoever . . ." paid to a person exercising an office or employment of profit. The language used seems wide enough to cover the fees received for the referred cases.

Fall in Earned Income

"A. B.'s" earnings for the year to December 31, 1940, show a fall of 18%—i.e., less than the statutory requirement of 20%—but a comparison between the amount of the assessment and the earnings for the year to March 31, 1941, will probably show a fall in excess of 20%.

*** "A. B." can claim to base the comparison on the year to March 31, 1941. The most convenient method is probably to take three-quarters of the 1940 profit plus the amount of the profits for the three months to March 31, 1941, as representing the earnings of the year to that date.

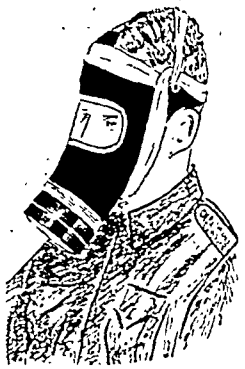
LETTERS, NOTES, ETC.

In Gratitude to Medical Colleagues

DR. LEWIS G. GLOVER, Honorary Treasurer of the Royal Medical Benevolent Fund, writes: I desire to acknowledge gratefully through your columns a donation of £50 which I have received from a doctor as a mark of appreciation of the great kindness and consideration he has received from his medical colleagues during his wife's recent illness, which necessitated an extensive abdominal operation. He adds: "It is a very small return for all the kindness and skill that has been expended on my wife. I wish my means allowed for a bigger cheque, but I hope that I may be helping, through the Royal Medical Benevolent Fund, some unfortunate fellow medico or his dependants."

How to Make a Civilian Respirator More Serviceable

DR. THOMAS MARLIN (London, W.1) writes: People who have to move about vigorously while wearing the civilian gas mask experience a certain amount of inconvenience, because the mask, owing to its non-rigid construction, flaps about from side to side, and is apt to pull away from the face. This can be prevented by the following simple method devised by Mr. A. L. Bunker, an ambulance instructor in a Home Guard battalion. Take a strip of cloth 54 inches long and 2 or 3 inches wide and place it over the crown of the head so that one end is shorter than the other. The short end should reach to the breast pocket. Now, holding an end in each hand, bring the longer end under the point of the jaw and up the other side of the face. Cross it with the other end above the temple (see illustration). Carry the longer end round the back of the head and the shorter end across the forehead. Tie the two ends together where they meet.



Plaster Casts for Fractures

Messrs. T. J. Smith and Nephew, Ltd., of Neptune Street, Hull, have prepared for issue to the medical profession only a pamphlet entitled "The Preparation of Plaster Casts, with Special Reference to the Use of Wide 'Cellona' Material." This is available on application to the medical department of the firm at the address given above.

Calcium Lactate: Correction

DR. J. A. BROWN (Birmingham) writes: I apologize for the error in the prescription published under the above heading (March 22, p. 468). The quantities are obviously transposed and the prescription should read:

℞ Calcii carb. 3j
Ac. lactic. 3iij
Aq. .. .. ad 3viij

F.M. Sig.: 3ss t.d.s.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 5 1941

REHABILITATION OF THE INJURED

BY

E. A. NICOLL, M.D., B.Ch., F.R.C.S.Ed.

Surgeon-in-Charge, Fracture Clinic, Mansfield General Hospital; Surgeon-in-Charge, Miners' Rehabilitation Centre (Midland Counties), Berry Hill Hall

Since the outbreak of war considerable interest has been aroused in the subject of "rehabilitation," and it is therefore important that the meaning and application of this word should be clearly defined. Unfortunately, different people use it in different senses. Sometimes it is used to denote the training of cripples for special occupations adapted to their disabilities; but this is not rehabilitation. It is vocational training, and should always be referred to as such. Rehabilitation is an entirely different process, the object of which is to cure or reduce disability resulting from trauma so that the injured person is enabled to return to his ordinary work in the industry in which he was formerly employed or, failing that, to useful alternative work in the same industry. Vocational training is essentially a process of compromise with disabilities that must be accepted as permanent, and is necessary only in the relatively few cases in which rehabilitation fails. The more thoroughly the problem of rehabilitation is tackled the less need there will be for vocational training.

Standardization of Results

It is obvious that the difficulty of the problem depends on the nature of the work for which the patient has to be reconditioned. If a carpenter sustains a compression fracture of the spine or a fractured femur he will be fit for full work at a stage in which a miner is only fit for what is euphemistically described as "light work" in a pit. It is difficult to suggest a universal standard by which results may be assessed and compared, but in my own work amongst injured miners return to full work has been adopted as the criterion of full recovery. Return to permanent "light work" is classified as permanent partial disability, and inability to do any useful work in a pit is regarded as permanent total disablement. To appreciate these standards something must be known regarding the nature of a miner's work. To get to it he usually has to walk several miles underground on difficult surfaces. The head-room of his working space averages about three and a half feet, but may be as low as two feet. The average amount of coal which each man hews and loads at the coal face under these cramped conditions is twelve tons per shift, but it may be as high as eighteen in an easily worked seam. Finally, there is no really light work in coal-mining, and the jobs that are usually given under this heading are the equivalent of full work in most other industries.

These standards are unusually severe tests of recovery, but they have the advantage of searching out imperfections which less exacting methods fail to disclose. Half the cases in my fracture clinic—that is, about 1,200 a year—are those of miners injured at work, and it is in respect of these that statistics are kept regarding restoration of working capacity.

The Miners' Rehabilitation Centre

My experience in rehabilitation as a special problem is derived from the Miners' Rehabilitation Centre at Berry Hill Hall. This centre was established by the Midland Colliery Owners' Mutual Indemnity Company in association with the Bolsover and Butterley Colliery Companies, and is at the service of the entire coalfield, which extends over seven counties. It is administered by a committee consisting of two representatives of the Owners' and two representatives of the Miners' Union. The rehabilitation problem in coal-mining is a very big one because the accident rate is so high (five times higher than the average industrial accident rate), the injuries are of a severe type, and there is no really light work to offer disabled men. Among the 100,000 men employed by the owners concerned in this scheme there are 18,000 accidents a year in respect of which compensation is paid; 6,000 of these men are totally incapacitated for more than a month, and 800 for more than six months. It is chiefly from the latter class that the cases for the rehabilitation centre are drawn. In my own fracture clinic about 15% of the cases are transferred. These are of three kinds:

(*a*) Severe injuries—e.g., fractured femur, compression fracture of the spine—which, on past records have a high risk of permanent partial disablement as judged by the criterion of return to full work as miners. These cases are transferred as soon as the men are capable of undertaking daily exercises.

(*b*) Cases which have come to a standstill short of full recovery, however simple the original injury might have seemed. Formerly these men were sent back to light work in the hope that it would prove remedial and that they would progress to full work in the course of time. A recent survey has shown that in fact 60% of such men remain permanently on light work. The reason for this is not far to seek. Light work, if it is to have any remedial value, must be selected, supervised, and graduated by the surgeon just the same as any other form of occupational therapy. In actual practice light work usually terminates the surgeon's connexion with the case.

(*c*) Cases in which some permanent disablement is inevitable from the outset but in which much can be done to reduce this and so restore to permanent light work patients who might otherwise have been totally disabled.

The Miners' Rehabilitation Centre is a modernized country mansion with 100 acres of grounds, to which a first-class gymnasium and a remedial workshop have been added. It is not part of a hospital, and this in my opinion has definite psychological advantages. Patients who live near enough are allowed to attend daily, but

those from further afield and all who are under-nourished or whose home circumstances are in any way unsuitable are kept in residence. The treatment is intensive and individual, and consists of graduated remedial exercises, occupational therapy, physiotherapy, and remedial games. Perhaps most important of all is the daily and hourly preaching of the gospel of rehabilitation—that recovery can only come by the unremitting hard work of the patient himself.

Importance of Soft Tissues

Before describing these methods of rehabilitation in detail I would like to draw attention to certain general principles which have an important bearing on the earlier stages of treatment. Recovery of function depends ultimately on the muscles, which may be affected either directly at the time of injury or by atrophy due to disuse. Direst trauma may mean actual laceration as in a compound fracture, simple contusion as in the case of a long bone ensheathed in muscles (e.g., fractured femur), or over-stretching as in hyperflexion fractures of the spine. The difference between immobilizing a normal muscle and immobilizing a damaged muscle is that whereas both undergo atrophy, the latter is much more liable to undergo contracture as well, owing to the organization of traumatic exudates into fibrous tissue. The degree of contracture will depend on the severity of the initial damage and the duration of immobilization, and its effect will be to cause limitation of movement in the joint over which it acts. If, for example, an uninjured quadriceps is immobilized for ten weeks in the treatment of a fractured tibia and fibula full movements of the knee-joint are usually recovered within a week of removing the plaster; but if a contused quadriceps is immobilized for ten weeks in the treatment of a fractured femur, flexion of the knee-joint takes months to recover, and the majority of cases never recover full flexion.

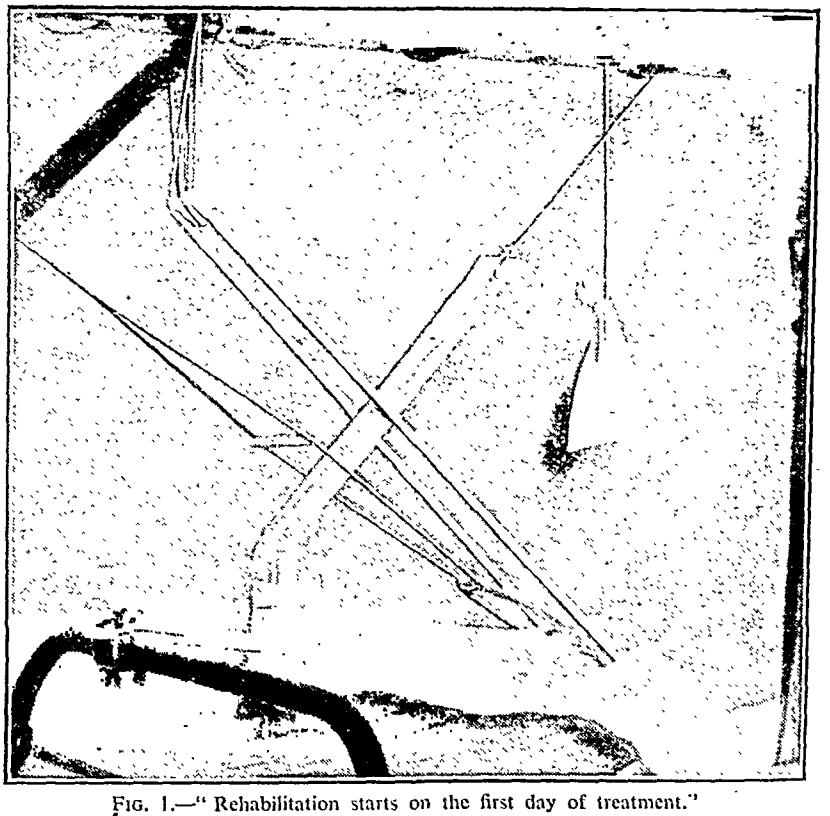


FIG. 1.—"Rehabilitation starts on the first day of treatment."

The chief problems encountered in the later stages of rehabilitation result from the immobilization and disuse of damaged or normal muscles—loss of power due to atrophy, stiffness due to contracture, and pain due to localized fibrosis. These are the disabilities that remain with the patient for ever—the true "end-result disabilities" that so often spoil a good radiographic result. If every case were regarded from the first not simply as a fracture but as a soft-tissue injury complicated by a fracture there would be less danger of looking upon rehabilitation as a sort of salvaging process to be undertak the remote future. On the contrary, the attitude c surgeon should be such that conservation of functi the soft tissues becomes a major issue from the beginning. A wasted fibrotic muscle is not an a Providence and it cannot be cured by the laying c hands or any other mysterious process in the ph therapy department. It is as great a reproach to surgeon and a greater handicap to the patient th malunited fracture, because whereas the latter is a chanically correctible disability, the retrogressive cha that take place in neglected muscles are incurable once have passed a certain point. It is the responsibilit the surgeon to see that they do not pass this point du the period of immobilization.

Conservation Muscle Functi

Conservation muscle func during the pe of healing of fracture app both to the p that are immo ized and to th that are free to but are out functional use. few examples serve to illustr the principles volved.

1. In a "belo the-knee" plast (e.g., in a fractur dislocation of t ankle) the object a walking-iron is make the patient u his quadricep against the resi ance of body weigh which is infinite more effective f conserving the function than no weight-bearing exe cises of the kne joint. The cal muscles, however, are the real problem in these cases. The cannot exercise at all in a normal sense; but, even so, they nee not be regarded as out of the picture until the plaster is removed The synergic action of muscles should be taken advantage of. I the toes are actively and strongly dorsiflexed the plantar flexor of the ankle-joint immediately contract synergically. They d this in order to fix the ankle-joint, which would otherwis be dorsiflexed by the extensors of the toes; but the refle is so fundamental that they still contract even when the join is already fixed in plaster. If toe exercises are done strongl enough and regularly enough in such a case the synergi contractions of the leg muscles induced thereby will be suffi cient to prevent a good deal of wasting and fibrosis during immobilization. Similarly, in an arm plaster, if the finger are strongly flexed the extensors of the wrist go into synergic contraction, while strong extension of the fingers brings the flexors of the wrist into similar action. Yet how often are finger exercises, and especially toe exercises, neglected al together, or the plaster so badly cut that they are impossible? A very important point in these exercises is that they must be done strongly—gentle ladylike movements produce little synergic effect.

2. In a fractured femur the position is reversed. The ankle is free to move, though out of functional use, while

the quadriceps is only free to perform "static" contractions. These, however, must be done with the greatest regularity throughout the period of immobilization from the third week onwards. In regard to the "defunctioned" ankle-joint, this should not only be exercised through a full range of movement but it should be exercised against resistances comparable to weight-bearing stresses, thereby treating the leg muscles as one does the quadriceps in a "walking-plaster." Many text-books on fractures still reproduce photographs showing methods of supporting the ankle-joint in fixed dorsiflexion on a Thomas splint. This is entirely wrong. It should be free to move all the time, but its position of rest should be that of dorsiflexion. The simplest and most effective method of doing this is shown in Fig. 1: the weight in the bag is gradually increased so that during the whole period of splint treatment the patient is practising graduated resistance exercises for the calf muscles. No patient treated for fractured femur should ever have the slightest difficulty afterwards in regard to either the ankle-joint or the calf muscles.

3. In hyperflexion fractures of the spine conservation of function in the extensor muscles of the back is of paramount importance. Ankylosis in bad position gives a perfect functional result provided the muscles recover, but failure of these to recover always results in partial disablement for heavy work, however good the reduction and consolidation of the fracture.

These and similar measures for the conservation of muscle function require a great deal of co-operation on the part of the patient, and the surgeon or some responsible member of the fracture clinic team must be prepared to ensure that it is forthcoming. Ignorance, stupidity, apathy, and sheer laziness must all be overcome. In a fracture ward there are always a few good "workers" who can be disposed at strategic points where their influence and example will spread to less determined patients. Another asset is a ward sister who is more concerned with seeing that exercises are carried out than with keeping the bedclothes tidy. In out-patient cases instructional exercise classes must be held for those in plaster, and these patients must be thoroughly impressed with the necessity for carrying out their exercises assiduously at home. In fact, the more experience one gains in dealing with the later stage of rehabilitation the more one is impressed with the importance of these earlier measures. With good muscle recovery and an imperfect radiographic result there is always hope of complete functional recovery; but even if this does not materialize, operative correction still offers a chance of completely retrieving the situation provided muscle power is conserved. On the other hand, perfect radiographic results combined with atrophied fibrotic muscles end in disability that is permanent and irretrievable. It is no satisfaction to a working-man who cannot earn his living to know that his radiographs are being used to demonstrate the principles of accurate reduction.

Power and Mobility

At the Miners' Rehabilitation Centre the more one analyses disability the more one becomes convinced that the key to success is restoration of muscle power. Mobility is an advantage only in proportion to the power of the muscles to control it under the conditions of stress normally encountered at work. One has to think of plantar-flexion of the ankle, for example, in terms of pushing tubs of coal rather than in terms of walking across a floor. Muscles have two functions in regard to joints—they supply motive power in one direction and act as shock-absorbers and stabilizers in the other. This shock-absorbing mechanism is of great importance to miners and other working-men whose joints are subjected to great strain. If it is deficient the joint "gives way" under stress and a mild sprain is produced. Repeated traumata of this kind lead to chronic synovitis or even arthritis, which in their turn exert an inhibitory effect on the muscles so that a vicious circle is set up. That is why a patient who returns to heavy work with weak quadriceps complains that his knee swells at the end of the day and his leg does not get any stronger in spite of active use. It is also why traumatic arthritis is progressive, and the only rational treatment of the latter, therefore, is to strengthen the muscles that exercise a protective action on the damaged joint.

To a miner diminished mobility with full muscle power gives a much better functional result than full mobility with diminished muscle power. I have seen several instances of men with only 45 degrees of movement at the elbow-joint doing full work at the coal face while other men with 120 degrees of movement were unable to do so. Mobility, therefore, is not always an end in itself, and if muscles already weak have to be stretched in order to produce it, as in manipulative treatment they often are, the patient may be better off without the extra mobility.

Muscle-efficiency Tests

It is obvious that if muscle power is the key to success some method of measuring it must be adopted so that the value of different kinds of treatment may be assessed. This is done at Berry Hill Hall by expressing the power of a particular group of muscles as a fraction of the sound side. In the case of the extensor muscles of the back, which cannot be expressed in this way, a known standard is determined by testing normal subjects. The apparatus necessary to determine muscle efficiency is a system of pulleys and weights designed so that any desired movement can be isolated and performed against measured resistances. In the quadriceps extensor group, for example, the method employed is to load the sound leg till its "exercise tolerance" is reached. By this is meant the greatest weight that can be raised fifteen to twenty times in succession as an exercise. The same procedure is then repeated on the injured leg, and the result expressed as a fraction (e.g., $\frac{R}{L} = \frac{12}{25}$).

These muscle-efficiency tests have been carried out in a great many conditions, and the results are very instructive. For example, in compression fractures of the spine treated by reduction and ambulatory plaster for four to six months the efficiency of the extensors of the back is often as low as 20% after removing the plaster. This is so in patients who have done exercises throughout the period of immobilization. The results of these muscle-efficiency tests are charted week by week in the form of a graph, and constitute a very reliable guide to progress and to the value of different methods of treatment (Fig. 2).

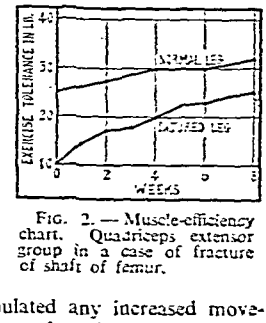


FIG. 2.—Muscle-efficiency chart. Quadriceps extensor group in a case of fracture of shaft of femur.

It becomes obvious at once why it is better to recover joint mobility by active movements alone. To do so ensures that muscle power increases with the mobility, so that the joint never recovers more movement than can be controlled under stress. In the great majority of cases stiffness after fractures is due to fibrosis in the muscles, and if such cases are manipulated any increased movement obtained is at the expense of tearing and stretching the fibrosed muscles. The charts of such cases reveal an immediate drop in muscle efficiency—often as much as 50%.

Manipulation should be avoided as far as possible, therefore, in those cases in which stiffness is due to

muscle fibrosis. Sometimes it has to be resorted to because the degree of stiffness is outside the limits of functional usefulness at work, and then the golden rule is to do a little at a time and repeat it every few weeks. If this is done the depression of muscle efficiency is minimal and the pre-manipulative level can be regained in a week or two. During the intervals the stretched muscles are treated daily. This treatment consists of active exercises to the limit of tolerance, deep massage to painful areas, and surging faradism. There is a second type of stiffness due to fibrosis and contracture in ligamentous or capsular structures, and this responds well to a full manipulation. The muscle efficiency in these cases is not depressed by the manipulation, and subsequent recovery is dramatic.

The Analysis of Functional Disability

The first essential in rehabilitation is an accurate analysis of the disability. The patient does not tell the surgeon which muscles are at fault; he expresses the disability in terms of function, and says what he cannot do or what he finds difficult or painful. In leg, back, and pelvic cases there is nearly always some disturbance of gait to analyse as well. Good analysis depends on a knowledge of the anatomy of function, which is not the way we learn anatomy. We are taught the action of isolated muscles instead of the muscle work of purposive movements such as walking, lifting, pushing, and so on. Yet without this knowledge it is impossible to analyse faulty gaits, obscure aches and pains, and difficulty in performing certain everyday acts. Still more impossible is it to analyse difficulty in performing complicated movements encountered in the course of heavy work. A patient may say, for example, that he can walk all right on the flat but finds difficulty in walking downstairs. This is common in quadriceps cases and is simply a question of mechanics. When the whole body weight is on one leg, the more the knee-joint flexes the more power is required on the part of the quadriceps to stabilize it, just as the load on an engine pulling a train round a curve is very much greater than when it pulls the same train along a straight track.

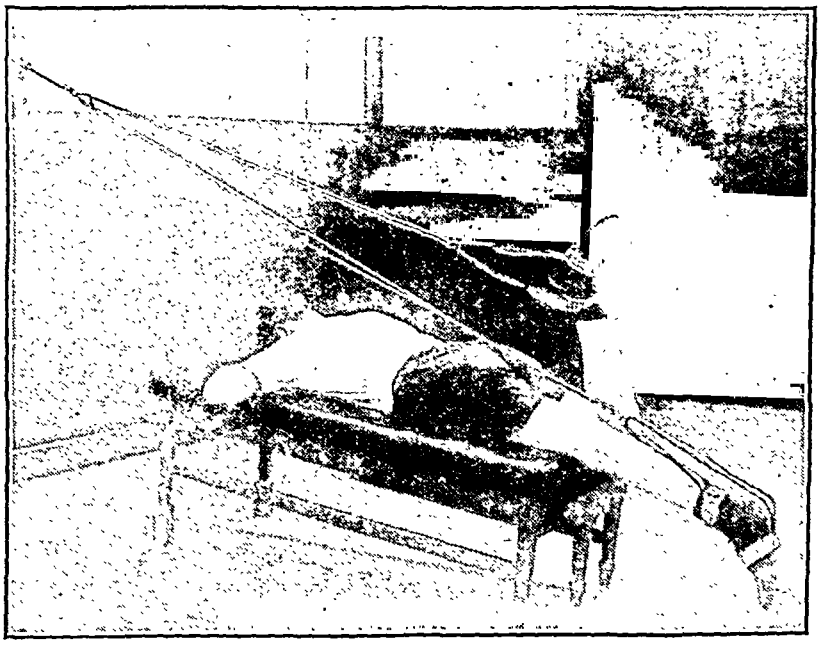


FIG. 3.—Mobility exercises: the auto-assistance principle

Lifting weights off the ground, which is vitally important to miners, is chiefly a gluteal action extending the hip-joints, but the spine must be fixed in relation to the pelvic girdle by a powerful static contraction of the sacro-spinalis muscles. It is failure of the latter that prevents miners from doing heavy work at the coal-face after a compression fracture of the spine; but the same functional disability might be due to a myofascial sprain of the gluteus maximus. All the miner knows is that he cannot lift the sort of weights he is called on to lift at work, and that efforts to do so are painful. Intelligent rehabilitation therefore depends on good analysis of functional disability, which in its turn depends on a knowledge of the anatomy of function and of the effects of trauma on soft tissues.

Remedial Exercises

Having analysed functional disability on these lines what is the remedy? What, in other words, is the secret of redeveloping weak muscles? The answer is that it can only be done by the unremitting efforts of the patient himself. Muscles hypertrophy only in proportion to the demands made upon them day after day and week after week. That is why professional footballers have such magnificent quadriceps, though their arm muscles may be quite ordinary. Exercises must therefore fulfil two conditions: they must be specific for the muscles concerned, and they must be progressive. The principle of progression is of the utmost importance in rehabilitation whether in relation to remedial exercises, occupational therapy, or games. Remedial exercises constitute the backbone of treatment, but they can only succeed if certain conditions are fulfilled. They must be performed day in and day out *ad nauseam*; they must be performed against gradually increasing resistances, and the periods of exercise must be correctly spaced with periods of rest so as not to induce undue fatigue. They fail in most cases because none of these conditions is fulfilled. The outpatient who attends an exercise class three times a week is rarely treated as an individual. He is a member of a "class" for back or leg or arm cases, and does the same exercises without progression from start to finish. Moreover, he seldom exercises during the intervening periods, through lack of instruction to do so, lack of self-discipline, or gradually increasing apathy as his disability drags on.

At the Miners' Rehabilitation Centre remedial exercises are carried out in the gymnasium for two periods of an hour and a half each day. They are arranged into a series of progressive schemes for each type of case, and are under expert supervision. In a back case, for example, there are four schemes, and it takes the average patient eight weeks to work through them. It is outside the scope of this paper to describe remedial exercises in detail, but one or two points are worth special mention. The first is in regard to a type of assisted active movement in which the patient himself provides the assistance with the opposite limb. It is illustrated below for flexion of the knee (Fig. 3). This type of mobility exercise is specially useful (*a*) when unassisted active movement is painful (this is frequently the case in shoulder injuries, or after a manipulation); and (*b*) when unassisted active movement is not powerful enough to make any headway

against the resistance imposed by the fibrosed structures causing the stiffness.

I know that passive movements are nowadays condemned, but many of these patients would never make any headway without some assistance. I differentiate between passive movements and assisted active movements, however, and, provided the assistance is given by the patient, it can do nothing but good. Relaxation of the opposing muscles is the crux of the matter, and to obtain this the patient must have perfect confidence. If a second person is providing the assistance the patient instinctively puts the brake on long before the limit of tolerance is reached, because any other method of informing the operator that he is approaching this point would be too slow to act in time. With the patient himself in control, however, perfect relaxation is possible right up to the full limit.

The second point is in regard to graduated resistance exercises, which are extensively used for selective strengthening. The principle is best illustrated by the hypertrophy of involuntary muscle. If the intestines or the bladder have to work against a gradually increasing obstruction they invariably hypertrophy—often to a remarkable degree. The two factors which produce this hypertrophy are a gradually increasing resistance and a muscle acting almost continuously in an effort to overcome it. If the load is increased too suddenly, however, failure occurs. These factors apply equally to voluntary muscle, and the more difficult the case the more gradual must be the progression. The muscle-efficiency chart is the real index of progress.

To give graduated resistance exercises the same pulley-and-weight apparatus described earlier for measuring muscle efficiency is used. It can be applied to any muscle group in the body, but to illustrate the method the quadriceps extensor group will be used as an example. First of all the exercise tolerance of the affected muscle is determined—that is, the greatest weight the patient can raise with his quadriceps fifteen to twenty times in succession. At regular intervals, depending on the individual factors, half a pound is added, often without the patient's knowledge. He can work with these maximum loads for only very short spells, so the method followed is to intersperse these with more prolonged exercises against 50% of the maximum load. By this method satisfying results have been achieved in the most unpromising cases. As an example, it has been found possible to increase the quadriceps efficiency from 4 lb. to 26 lb. (normal leg, 32 lb.) in an old-standing case of a man who had been off work for two years following a knee injury.

Accessory Methods

The other forms of treatment used, which make up the rest of the six-hour day, are occupational therapy, physiotherapy, and remedial games. These are accessory methods, however, and it is fallacious to think of rehabilitation entirely in terms of one or the other, as a good many people nowadays do. Indeed, this seems to be the official conception of rehabilitation. At Berry Hill Hall we rely on remedial exercises to gain ground, and on occupational therapy and remedial games to consolidate it. The idea of adding creative interest on the one hand or competitive interest on the other is very sound and attractive, provided such ideas are not allowed to become a hobby-horse and obscure the essentials underlying them. The weakness of both is that neither the principle of selectivity nor the principle of progression can be so scientifically applied. Furthermore, none of the forms of occupational therapy in standard use would get a miner anywhere near the stage of full work.

Occupational Therapy.—It is impossible in the limits of this paper to deal in detail with the application of occupational therapy or remedial games to particular injuries, but a brief description of both as organized in a rehabilitation centre may indicate their general usefulness. Occupational therapy is divided into indoor and outdoor work. The men at Berry Hill Hall assist in the laundry and do all the domestic cleaning in the gymnasium. In the craft-room the hand and arm cases are taught to make wicker-work baskets, trays, and stools, and leg cases to do treadle work. The remedial workshop is equipped for simple carpentry, and a miniature conveyer-belt has been installed which gives the back cases an opportunity of practising the movements and experiencing the stresses peculiar to their own work, but under controlled and progressive conditions. The belt runs over spindles operated by cranks, and motive power is provided by the advanced arm and shoulder cases. The action is like that of turning a mangle, but it is a progression on laundry-work. Logs of wood weighing from 10 lb. to 80 lb. are used instead of coal. Outside in the grounds of the estate there are gardening, timber-work (tree-felling, log-sawing, etc.), and the care of lawns, cricket pitch, tennis court, bowling green, etc. Each patient is scheduled to a class of work suitable for his injury, and as he makes progress in his gymnasium work he is correspondingly advanced in occupational therapy.

In addition to these forms of occupational therapy, some of which (e.g., timber-work) are quite heavy, I am able to use the enormous resources of the industry in placing men at a variety of jobs in the pits which can be used as a very advanced form of occupational therapy. Most back cases, for example, are sent to a period of "datalling" work, which involves a good deal of walking, bending, shovelling, and lifting, but allows the workman to pause occasionally between efforts instead of going "all out" all the time, as he would have to do at the coal-face. A knowledge of industrial processes is needed to place men properly if light work is to be successfully used as a remedial agent, and it is necessary to keep contact with such cases. Periodic re-examinations are therefore made till they either resume full work or have otherwise reached the limits of progress and been placed in the class of permanent light work most suitable for them.

Recreational Activity.—This also takes indoor and outdoor forms. Many games can be played in the gymnasium, but there is much more scope in the open air. Games such as badminton, bowls, croquet, etc., are played for amusement after the day's treatment has finished. During the official games period, however, the men are supervised in their activities and the games are more adapted and remedial. Back cases do particularly well on games like basket ball and tunnel ball. Leg cases, however, have to be carefully watched if they are allowed to play running games, otherwise a considerable number of sprains will be incurred, especially if there is a football about. This is because the muscles of these patients are not efficient enough to protect their joints against the sudden twists and strains of vigorous games. Leg cases are sent out in groups on bicycles, which is one of the most excellent of all forms of recreational activity, and many patients living within five miles or so of the centre cycle in every morning as part of their treatment. As in occupational therapy, recreational activity must also be progressive and adapted to the injury, and there is infinite scope for originality and ingenuity in the invention of new games to promote particular movements.

Physiotherapy.—Physiotherapy is confined to faradism and deep massage. The former is used as an auxiliary method of strengthening weak muscles; the latter in dealing with painful areas in muscles. These are quite

common following trauma, and they inhibit full active use of the muscle so that the patient is never able to get the maximum benefit from remedial exercises. They are due to localized fibrosis in areas to which traumatic exudates have gravitated. Deep massage is very effective, but it must be done properly—skin-stroking is useless. Preliminary injection with 2% procaine just below the muscle aponeurosis is helpful in many cases. Once the pain is abolished there is a dramatic increase in muscle power, showing that this was there all the time but was inhibited by the pain. In the analysis of disability referred to earlier it is important to distinguish this type of case from the one in which loss of power is due to atrophy alone, since the treatment is quite different.

Summary and Conclusion

In this paper the principles underlying the process of rehabilitation have been described. The final stages of this process are best carried out in special centres, but the earlier measures directed towards conservation of muscle function during immobilization are of equal importance.

The methods of treatment employed in a rehabilitation centre for injured miners are described. This centre was established by the employers of 100,000 workmen, the accident rate amongst whom is five times greater than the average accident rate in industry.

The only criterion by which success in rehabilitation can be judged is the patient's return to full pre-accident work and activity. Clinical attempts to assess this are unreliable. In a consecutive series of 1,200 patients treated in one year in the Mansfield Hospital Fracture Clinic, all of whom were miners injured at work, 87% resumed their full pre-accident occupation, and 9% resumed lighter work in the same industry. There was a mortality rate of 1%. In about 15% of the mining accidents dealt with in this clinic treatment is completed at the Miners' Rehabilitation Centre.

The Central Council for Health Education is able to command the services of some most talented people with the pen, pencil, and camera, and some of its leaflets, which are sold at production cost to local authorities and distributed in various ways by medical officers of health, are as telling as the very best commercial advertising. Three pictorial leaflets bearing the titles "Ears to Hear," "Eyes Right," and "Sleep" convey their message in a series of film-like pictures which make words largely unnecessary. A number of posters have also been brought out by the Central Council, and are so emphatic in their design and colour that he who runs may read. For those who may prefer to do their reading while not running there are a number of pamphlets on such subjects as the prevention of diphtheria, the war on lice, the elementary facts concerning milk, food, water, and sanitation, which lack nothing in the directness of the advice they give. A whole series of leaflets has been prompted by war conditions. Among them is a 16-page booklet on "Health in the Shelter," in which the clever levity of the drawings relieves the necessary seriousness of the text. It is the aim of the council to secure that every possible subject connected with health on which the public ought to be informed shall be illustrated by a popular leaflet or pamphlet. The war has opened up quite a number of new subjects, of which "Health in the Black-out," the title of a new leaflet, is one. The attractive booklet, "The Doctors tell you what to eat in Wartime," which was prepared by the British Medical Association at the request of the council, is another example of activity in this direction. It is suggested that some of these leaflets might be placed on the table in the waiting-rooms of medical practitioners. Medical practitioners, however much it may be against their mundane interests, are amongst the best apostles of preventive medicine, and we do not doubt that many of them will accept the invitation of the Central Council (whose address is Tavistock House, Tavistock Square, W.C.1) to have a free supply of this health publicity material sent to them for this purpose.

PULMONARY CONCUSSION ("BLAST")

BY

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"Every new ordeal to which the lung of man is exposed produces if not an entirely new lesion at least a new angle from which to study an old one."—LANCET.

"Pulmonary concussion" is a term which has been used for haemorrhagic lesions of the lungs resulting from the detonation of high explosive. Cases are recorded here which show that virtually the same syndrome can be brought about by the ordinary forces of civil life as by the action of bombs.

Experimental and theoretical considerations have now established beyond reasonable doubt that blast injuries of lungs are produced by the high-pressure wave of the blast acting for a short period; in other words, it is due to a sudden diffuse compression of the lungs through the chest and abdominal walls, and is typically unaccompanied by obvious injuries of the thoracic wall. "Diffuse" does not mean that the two lungs are equally affected, just as injury to the thoracic wall does not exclude the action of blast. A sudden diffuse compression of the lungs can readily be brought about by mechanical causes. More important under war conditions is the fact that the compression of blast and of mechanical forces frequently occur together. The most important difference between war and civil cases is the greater degree of violence in the former.

Comparison of Peace and War Injuries to the Lungs

I have notes of 94 necropsies made during the last three years on persons dying through road accidents. In reviewing these it is notable how many ribs may be fractured with no lung injury at all: 6 cases, all those of men between 58 and 69, had multiple rib fractures but no lung damage. Four more had multiple rib fractures and minor lacerations of the lungs from the rib ends, but no appreciable contusion of the lungs; these cases were those of a boy aged 13 and three men between 39 and 44. A man aged 21 showed lacerations and pulping of the lungs after an aeroplane crash. Three patients with fractures of the skull inhaled some blood; these were males aged 10, 13, and 19. Only 3 of the 94 had lung lesions comparable to those of the bomb cases; these were in girls aged 4 and 8, and a boy of 7. The best example is a girl of 4. A motor-lorry had run over her and caused a fracture-dislocation of the sixth and seventh cervical vertebrae, but no fracture of or external mark on the trunk. Her lungs showed multiple haemorrhages, which all appeared on the pleural surface; they were most numerous in the parts of the lungs which enter the phrenico-costal sinus of the pleura and posteriorly, but there was some rib marking on the lateral surfaces. The liver showed a small laceration of the posterior surface and there were some peritoneal tears in the transverse colon. The girl of 8 had been knocked down by a motor-car; she showed a little bruising over the left lower ribs but was otherwise unmarked; the ribs were not fractured. There was a haemothorax of nearly two pints on the left and a smaller one on the right. There was a large tear near the hilus of the left lung, and contusions were scattered fairly generally throughout both lungs. The liver was torn but the spleen was not. The boy of 7 was run over by a motor-lorry. He sustained an extensive fracture of the skull with brain injury. The trunk was not marked. The left lung showed a widespread haemorrhagic lesion about the hilus posteriorly, "rib markings" extending about three-

quarters of an inch deep, and a wedge-shaped contusion of the part in the phrenico-costal sinus. The right lung revealed innumerable haemorrhages the size of a pin's head, due to inhalation of blood from the left; the spleen showed a little superficial bruising only. The brain injury indicates that death must have been very rapid.

Lung injuries were therefore present in only 8 of the 94 cases. Of the 8 cases 4 were simple lacerations from fractured rib-ends and one was too gross to be of interest. The 3 most important cases were in children with flexible chest walls, and both were accompanied by abdominal injuries. The series does not include any case of compression asphyxia, but, looking through the series of asphyxial cases (suicidal hanging, homicidal strangulation, overlain babies, and babies born face down on to the placenta in a bucket), it is notable how inconstant Tardieu's spots are. My experience is the same as that given in Taylor's *Medical Jurisprudence* (1928), and does not agree with Ross (1941) that they "are nearly always found." They are interesting if found, but are so frequent in diseased conditions that they cannot be made a prominent part of any syndrome.

The four most interesting contusions of the lung did not occur in road accidents; they were described under the title of "phrenico-costal sinus pneumonia" (Osborn, 1940). The review of the road and bomb cases serves to emphasize the point made there that there is an abdominal component to the force which produces the basal contusion of the lung. If this wedge-shaped lesion is present the question is not "Is the underlying spleen or liver damaged?" but "How severely is it damaged?" It may be a trivial bruise or a hopeless tear.

The first 8 cases described below were from bombed houses.

Case 1.—A girl aged 17. Fractured skull the only external injury, no bruises or fractures about the chest or abdomen. The lungs showed a large wedge-shaped haemorrhage at the left base and a much smaller one at the right base; a fairly large haemorrhage into the posterior part of the right mid-lobe; haemorrhages posterior to the hilus on each side; and some small pleural haemorrhages laterally which were possibly "rib markings." Most of the haemorrhages reached the pleural surface. The upper pole of the spleen showed multiple tears; the liver and other abdominal organs were undamaged. This girl had blood-stained mucus and froth in the large air passages.

Case 2.—A woman aged 42, mother of the previous patient. She was beside her daughter when the house was hit, and also had a fractured skull. The upper three left ribs were fractured and the lung showed contusions in this region only; small haemorrhagic spots elsewhere were probably due to inhalation of blood. The lung changes in this case were very mild compared with those of the daughter; this may be because the mother was obese. She had no abdominal injury, and lived for about twelve hours after being hurt.

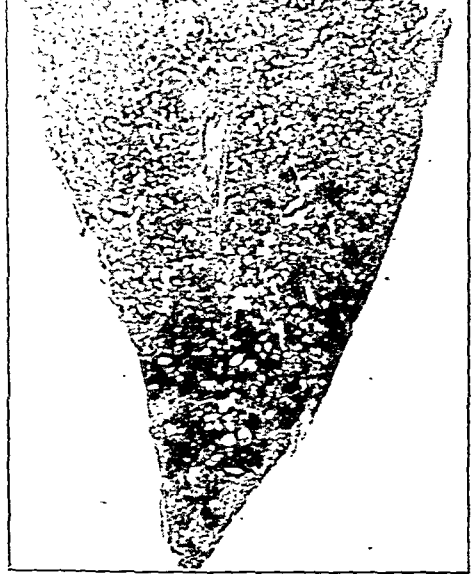
Case 3.—A girl aged 16 had multiple injuries which included pieces of wood driven into the trachea and left lung. There were scattered small haemorrhages throughout the lungs; a large one into the base of the right lung was accompanied by a ruptured liver beneath. The right hand and forearm had been blown off.

Case 4.—A young unidentified woman who was too mutilated for lesions to be instructive.

Case 5.—A man aged 40 who had a compound fracture of the skull but no injuries to the chest or abdomen.

Case 6.—A woman aged 40, wife of the previous patient, average size, not obese. There were large numbers of punctured wounds over the exposed parts of the body (head, neck, arms, and legs); with few exceptions these were superficial and did not contain foreign bodies. The largest were in the right supra-scapular and supra-clavicular regions; through the latter the axillary vessels had been pulped. This injury was of interest because it was evidently the place where a collection of dirt particles measuring 1 by 0.3 by 0.3 cm. had entered the vein to lodge in the right ventricle, the heart itself was not damaged. The skull showed four perforations about 1.5 cm. in diameter in the frontal and parietal regions; bone had been driven into the cerebrum through two of these. Both orbital plates of the frontals were fractured upwards, with orbital contents projecting through; there was no injury about the eyes to account for this. The base of the skull was not damaged otherwise, but there was haemorrhage into the middle and internal ear on the left side. The chest was free from external marks, but the upper four right ribs were fractured posteriorly at their angles; these had not caused any laceration of the lung. The right apex showed a healed tuberculous focus 1 cm. in diameter, the left apex a smaller lesion. Old adhesions were present over the right upper lobe and the left apex. The right pleural cavity contained half a pint of blood, the left none. Much blood and mucus (not frothy) were present in the trachea and large bronchi. There was a massive haemorrhagic lesion of nearly all the right upper and mid lobes; the right lower lobe was normal. Scattered throughout the left lung were very large numbers of small haemorrhagic spots due to inhalation of blood from the right side (see below). No pleural haemorrhages were observed on the left side. There was no phrenico-costal sinus lesion and no injury to the abdominal organs. This woman lived three hours.

Case 7.—A woman aged 26, of average size and nutrition. There was a perforating wound of the left chest posteriorly about the inferior angle of the scapula. A bomb splinter



Phrenico-costal contusion (Case 7). Photomicrograph (× 3) of wedge-shaped haemorrhage into base of right lung. The clear parts in the dark haemorrhagic zone are mostly distended alveolar ducts and small bronchioles. This lesion always suggests laceration of the underlying liver or spleen

weighing 2.5 grammes had passed through the seventh rib here, through the left lung in the interlobar region, through the anterior part of the pulmonary artery and the right cusp of the pulmonary valve, and had come to rest in the right ventricle close to the tricuspid valve without doing any damage in the ventricle. There was free haemorrhage into the lung along the path of the bomb fragment and also posteriorly; the left base was practically clear. The right lung was normal except for a perfect example of the phrenico-costal sinus contusion (see Fig.). This was placed laterally and posteriorly, was wedge-shaped, and measured 7 cm. from

front to back, 4 cm. upwards, and about 3 cm. deep at the upper part, which was appreciably raised from the surrounding normal lung on the pleural surface. This haemorrhage was firm, but lacked the almost stony hardness of the lesion in the civil cases which survived some days. There were multiple tears of the liver, tears of the upper pole of the spleen, and a superficial tear of the upper pole of the left kidney.

Case 8.—The 7-months-old baby daughter of the previous patient. She had a depressed fracture of almost the whole of the left frontal bone with brain tissue protruding around it. There were no other marks of any sort on the body. The lungs showed very distinct haemorrhagic rib markings laterally on each side; these became confluent in several places, notably the posterior portion of the right lung. In parts the rib markings extended a full centimetre into the lung, and were separated there, as on the surface, by clear lung tissue. All haemorrhages in these lungs were represented on the pleural surfaces. The only haemorrhages not related to rib markings were on each side in the part of the lung that enters the phrenico-costal sinus. These were not relatively as large as the wedge-shaped lesion in Case 7, but were associated with several tears in the liver. The abdominal organs were otherwise normal.

The following two very recent cases, which have a bearing on the mechanism of production of the lesions, may merit a brief note.

Case 9.—A girl aged 11 collapsed under an anaesthetic of open ether just as an operation for the removal of an acutely inflamed appendix was being completed. As she did not respond to the usual methods an upper abdominal incision was made and the heart was massaged. The auricles started beating, but not the ventricles. At necropsy she appeared to have been a healthy girl. She was deeply cyanosed; the blood was dark and fluid. There was extensive bruising of the ventricular muscle from the massage. This bruising was not beneath the pericardium, where the direct force had been applied, but was a very short distance from the endocardium. The endocardium was not injured. The bruising appeared to have been produced by the reactionary force of the compressed blood.

Case 10.—A baby girl aged 15 months was brought to the Infirmary moribund; she had inhaled a piece of bean four hours previously. This blocked the left main bronchus and part of the right. When seen by the casualty surgeon she had stopped breathing, but the heart could be heard beating infrequently. Artificial respiration was applied, but failed to revive the child. At necropsy the left lung was seen to be collapsed, the right partly collapsed. Very small numbers of Tardieu's spots were present, but haemorrhagic rib markings beneath the visceral pleura were quite distinct, especially over the left lung. The rib markings were very shallow when compared with cases from the bombed houses. They were probably produced by the artificial respiration, and were more noticeable on the left side because the left lung was extensively consolidated while the right still contained some air.

Microscopical Features

Two main types of lesion are seen microscopically. In the primary and larger haemorrhagic lesions there is free haemorrhage from the alveolar capillaries, while the alveolar ducts and bronchioles are typically air-containing and almost free from haemorrhage. The larger bronchioles and small bronchi in the worse lesions—e.g., the right lung of Case 6—give good evidence of compression of the lung from without. They are collapsed, and practically all the goblet cells in the mucosa have been ruptured, causing a stream of mucus to flow into the bronchial lumen; with the mucus is a little blood but very little air. The mucous glands and the basal, intermediate, and ciliated cells of the bronchial mucosa are little affected compared with the goblet cells. Incidentally this shows well how much mucus is available from goblet cells alone to make the bronchial mucous plugs of the influenzal lung. The relative scarcity of goblet cells in that part of the lung which enters the phrenico-costal sinus may account for the difficulty in recognizing this lesion in the wedge-shaped haemorrhages there. Rupture of goblet cells appears to indicate severe lung damage. Distension of alveoli with blood or air (emphysema) regularly accompanies compression haemorrhage, and subpleural bulla formation is fairly common.

The second main type is the result of inhaled blood, and is apt to be mixed with the previous type. Blood is present in the small bronchi of the affected region, and distension of alveoli is not usually as marked. Typically this lesion is relatively small and scattered, and in my cases has been accompanied by much more serous exudation in the surrounding alveoli than is seen in the compression haemorrhage. Goblet cells are, of course, not ruptured.

Is the Haemorrhage Progressive?

Hadfield and Christie (1941) state that they regard the haemorrhage in these cases as being progressive and that "in reviewing a series of post-mortem examinations of 17 of these cases we have been struck by the variability in extent of these haemorrhages, and it appears reasonable to relate this variation to the period of survival after exposure to detonation." With these statements I am quite unable to agree. The haemorrhagic lesions themselves are not necessarily fatal, though it is easy to imagine rapid death from shock. The most probable reason that their patient lived fifty-one hours is that the abdominal component appears to have been confined to submucous gastric haemorrhages. There are too many unknowns in my cases as well as in those described by Hadfield and his colleagues (1940) to imagine that we can correlate the extent of the lesion with the period of survival. Of these published cases the period of survival was known in only 4 out of 19, and though the notes of 2 are scanty it would appear that 3 out of the 4 patients who survived some time were not as badly affected as some who died more rapidly. The probable reasons for more severe lung lesions are the severity of the causative force and the state of the patients. By the state of the patients is meant whether they are obese or not, whether they have flexible or rigid chest walls, whether their lungs are in the position of inspiration (making it worse) or expiration at the time of injury, and the amount of clothing worn by the victim. It is the state of the patient which explains why these cases did not attract attention during the last war. The potential victims then were grown men wearing a respirator, knapsack, and other things which would protect their body walls from the impact of the blast wave; now we are seeing unprotected girls and children attacked by bombs in confined spaces. Some direct evidence can be given indicating that the haemorrhage is not progressive. First, the haemorrhage is into alveoli which are arranged in limited groups. Only a little of this blood gains access to a bronchus to reduce the raised pressure due to the haemorrhage. Secondly, the haemorrhage is from capillaries. Capillary haemorrhage typically ceases within about five minutes and requires only a slightly raised pressure to stop it. Thirdly, the cases of "phrenico-costal sinus pneumonia" seem to prove that the bleeding is not progressive. The wedge shape, size, and raised pleural surface laterally and cranially are similar in the cases of bomb injury and in the patients who survived for two and seven days. In the last two cases the most advanced organization was at the upper end of the lesion near the unaffected lung tissue: here the alveoli showed much more fibrin, and phagocytic cells were more active. There was no evidence of more recent haemorrhage at the upper limit of the lesion, and the best-preserved red cells were in the centre of the lesion, where it appeared that resolution would take longest. For these reasons I believe that the primary lesion is not progressive, but the reaction to the lesion may make it appear to be so, especially in *x*-ray plates.

Mechanics of Haemorrhagic Concussion of the Lungs

Reasons for believing that the lesions are due to the high-pressure wave of the blast acting on the body wall and not to positive or negative pressures acting through the trachea and bronchi are given by Zuckerman (1940), and need not be repeated. Additional proof is given here by (1) the mechanics of "phrenico-costal sinus pneumonia" (Osborn, 1940), and (2) the goblet-cell lesion and collapse of the bronchi in the worse cases.

Zuckerman (1941) goes to some pains to belittle the effects of blast unless the victim is very close to the bomb, and states that there have been very few cases of blast injury of the lungs in England so far. Lung injuries having the features described by Sir Joseph Barcroft (1939) and by Zuckerman in animals are now only too common in hospital practice. An attempt has been made here to show that the same lesion may result from a sudden diffuse compression of the chest and abdomen by bombs and mechanical means. Whether the lesion is entirely due to blast or not seems to be of little more than academic interest. Zuckerman may be correct when he says that there is little danger from blast more than thirty feet away from the explosion of a big bomb in the open, but there is no justification for belittling the effects of blast in confined spaces such as houses. We have no means of telling what blast pressures the victims in houses were exposed to: the positive pressure there cannot fall until free access to the outside air is obtained. There is also no justification for his statement that "at sixty or seventy feet the pressures did not really matter at all clinically, even though they might be sufficient to damage walls and windows" and "throw a man against a hard surface." Zuckerman's statement is usually true just as it is usually true that if we fall over we will not die of "phrenico-costal sinus pneumonia": in each case, however, it is how the violence is applied that matters, and the unusual in each case may be common in medical practice if sought after.

What is the force which actually brings about the capillary haemorrhage in haemorrhagic concussion? Two forces have to be considered. These are the compression of the lungs through the chest wall and diaphragm and the counter-pressure exerted by the air in the alveoli. When danger threatens it is instinctive for the muscles to go "on guard": this includes spasm of the glottis more or less locking the air in the lungs. The high pressure produced in this alveolar air by compression is the most likely force which ruptures the capillaries. This explains why the haemorrhages are deep and often massive; it may also help in understanding their distribution. In my cases this type of haemorrhage has mostly occurred in young adults and has not been associated with rib markings. Haemorrhages from the primary force are likely to be found in cases in which reflexes are not well established—e.g., in small babies and experimental animals. Thus Case 8 is a perfect example of haemorrhages produced by the ingoing ribs, etc., in a baby of 7 months. Other cases—e.g., Case 1—show a combination of both types of force. The findings in the baby's case certainly do not support Ross's (1941) statement that rib markings are a feature of "compression asphyxia" in which "death has presumably been slow, with attempts at respiration": at least I am sure that this baby died quickly. I cannot see how Ross correlates Sir Joseph Barcroft's and Zuckerman's findings in pure blast injuries of animals with her statement that "in haemorrhagic concussion the lesions are always bilateral and roughly symmetrical. There is general congestion of the lungs. Pleural haemorrhages are present only as an extension from deeper areas." Rib markings were the main findings in goats: "These lesions consisted of bruising of the surface of the lung in the line of the ribs and vertebral borders, and extended for one-quarter to half an inch into the tissue of the lung": this is also a description of the baby (Case 8). Zuckerman showed that one lung might protect the other if the animal was placed side-on to the explosion: this apparently is more likely to happen if the animal is fairly close to the explosion. To understand the lesions described for blast in animals and man there is no need to assume that blast has any mysterious properties: it is only a more severe diffuse sudden compression of the chest and abdomen than we see in civil cases during peacetime.

Main Clinical Features of Pulmonary Concussion

The great majority of cases so far reported have come from bombed houses and shelters: pulmonary concussion appears to be infrequent in cases injured in the open. In houses it takes longer to dissipate the high-pressure wave of the explosion, and mechanical factors are likely to be added to the blast effects. Pulmonary concussion should be looked for in every case from a bombed house.

Factors tending to minimize pulmonary concussion are advancing years, obesity, rigidity of the chest wall, the position of expiration, and thick clothing. Pulmonary concussion may take a number of forms, which depend on the state of the patient as much as on the degree of violence. The younger the victim the more probable is it that the haemorrhagic lesions will be subpleural ("rib markings"). Young adults usually have deeper haemorrhages. Much mucus in the air passages (with blood) indicates that goblet cells have been ruptured in the bronchial mucosa; this means that the lungs are severely affected.

So far too little attention has been paid to the fact that the abdomen is suddenly compressed as well as the thorax. The wedge-shaped lesion of the part of the lung which enters the phrenico-costal sinus of the pleura is of exceptional importance because it indicates with a high degree of probability that the underlying liver or spleen, or both, have been torn. If these tears are severe the victim will be found dead; doubtless some will be amenable to surgical intervention. In my small series the liver and spleen were affected much more often than the bowel; bowel tears were confined to the peritoneal surface and would have needed no treatment. Should operation ever be indicated the organ responsible for the abdominal haemorrhage is likely to be demonstrated by the side of the phrenico-costal sinus lesion. If this is placed posteriorly as well as laterally on the right side the tear in the liver will probably be inaccessible. Tears of the spleen are likely to be at the upper pole.

Pulmonary concussion is not necessarily fatal. Sir Joseph Barcroft found that his goats usually recovered if they were not killed rapidly; Zuckerman also found his smaller animals tended to get better. It is worth recalling that in one of my cases of "phrenico-costal sinus pneumonia" death resulted from acute pulmonary oedema after two days, and in another case death occurred from pulmonary embolism after seven days. The latter cause of death is preventable: it is due to stasis in the femoral veins allowing the formation of clot, which becomes detached after about a week and is then carried to the right heart and pulmonary artery. Pulmonary embolism is prevented by regular active movements of the lower limbs aided by raising the foot of the bed to prevent haemostasis and by avoiding dehydration and other causes of haemoconcentration. If the patient does not die soon death may result from complications such as these, and probably the most important thing in treating haemorrhagic concussion of the lungs is to anticipate and so prevent such complications.

A "very clear history of the incident" cannot be obtained by the clinician, and its importance in diagnosis and treatment has been much exaggerated. It is of great value to know that the case is from a bombed house or shelter, and this is nearly always known. With this knowledge the most accurate diagnosis of the state of the lungs will be made by a consideration of the state of the patient (see above) and not from a knowledge of the size of the bomb. The peculiar behaviour of blast on houses is now so familiar (e.g., I have seen a shop window within six feet of a bomb crater in the road with only a single crack) that it is just as likely as not that the clinician would be misled by a "very clear history of the incident." The clinician will not be misled if he applies sound clinical methods, which should include repeated radiographs, if possible, and special attention to the phrenico-costal sinus region.

The knowledge that the case has occurred in a confined space will also help the clinician if he keeps in mind the important observation of Hadfield and his colleagues that these patients are prone to suffer from carbon monoxide poisoning.

Summary

Cases of pulmonary concussion from civil life and bombed houses have been compared.

Pulmonary concussion is almost the rule in cases from bombed houses, but not from bomb injuries in the open.

The mechanism of the lesion is considered. In bombed houses mechanical factors may add to the effect of the blast pressure.

The state of the patient is probably of greater importance than the size of the bomb or the distance from it. Knowledge of the details of the bomb may be misleading. In houses the positive pressure cannot fall until walls and roof are blown open.

The actual lesion is mainly haemorrhage from alveolar capillaries. Only a little blood gets into the bronchioles, etc., in these parts. Rupture of goblet cells and liberation of much mucus indicates a severe lesion. Secondary inhalation of blood gives a different picture.

Certain parts of the lungs are predisposed to injury. Thus we find subpleural "rib markings," injury in the phrenico-costal sinus region, and deep and posterior lesions in the region of the hilus. A consideration of primary (compression) and reactionary (counter-pressure of air locked in alveoli) forces may explain differences.

The abdomen is typically compressed with the thorax. The most important lesions here are tears of the liver and spleen.

The lesion itself is not progressive, but the reaction is. Treatment is largely anticipation of complications. The usual methods of artificial respiration may cause pulmonary concussion.

I am indebted to Detective-Sergeant J. S. Fayers for the photomicrograph

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The London Hospitals Street Collections Central Committee (36, Kingsway, W.C.2) has issued a leaflet with reference to Hospitals Day in 1941, which includes a message from the Patron, H.M. the Queen. As in 1940, all participating hospitals will have the opportunity of collecting both in May and in October; the dates chosen are Tuesday, May 6, and Tuesday, November 7. A list is given of the hospitals co-operating and the amount received by each from last year's combined street collections, which totalled over £46,000.

ELECTRO-ENCEPHALOGRAPHY IN TRAUMATIC INTRACRANIAL HAEMORRHAGE

BY

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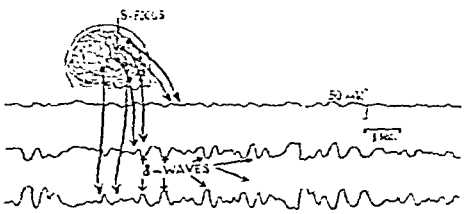
Electro-encephalography is becoming more and more important in the detection of various intracranial lesions, and Berger's contention that the phenomena which he described would afford a means of diagnosing certain pathological conditions of the brain may be said to have been generally upheld. So far, however, electro-encephalography has not been used to any extent in the investigation of cases of head injury; consequently it would appear desirable to record such evidence as may be obtained concerning its value in these cases, particularly when intracranial haemorrhage has occurred. Records from cases of traumatic intracranial haemorrhage are conspicuously few. In this country Prof. Rendle Short and Miss Dunster (1940) have published the findings in the case of a patient aged 42 with a middle meningeal haemorrhage upon whom operation was successfully performed. A tracing from a case of chronic subdural haematoma in an Italian aged 41 is included in a paper on electro-encephalography by Balado, Romero, and Noiseux (1939) of Buenos Aires; and some examples of intradural haemorrhage, both extra- and intra-cerebral, have been noted by Jasper, Kershman, and Elvidge (1940) of Montreal. The case here noted is a further instance of an encysted subdural haematoma following head injury which at the time of operation presented singularly few symptoms.

Case Report

On July 24, 1940, a marine aged 20 was knocked out in the boxing ring, and on regaining consciousness a few minutes afterwards had a severe headache. An hour later he vomited. He did guard duty that night, however, and was able to go out on a route march next day. His headache, which was now chiefly in the left frontal and occipital regions and at times was accompanied by pain in the back, continued, so he reported sick and was admitted to hospital. There was neck rigidity at this time, his temperature was 99° F., and his pulse was consistently slow (48 to 50). Both optic disks were blurred; the tendon reflexes were normal and the plantar responses flexor. Leucocytes numbered 10,000 per c.mm., *x*-ray examination of the skull was negative, and the cerebrospinal fluid pressure in the lumbar pond was 250 mm. of water; the fluid itself being deep yellow in colour, with a protein content of 120 mg. per 100 c.cm. The chief symptoms now were headache and photophobia, but these got better as he rested in bed. On August 29 Surgeon Captain Macdonald Critchley and I were called in to see him. He was inclined to be fatuous, the left knee-jerk was brisker than the right, and the left plantar response was extensor. High papilloedema with exudates and retinal haemorrhages was present in both optic disks. On September 24 Mr. W. Grey Walter, to whom I am much indebted for the tracing (see Fig.), carried out electro-encephalography at the Burden Institute under the direction of Dr. Golla, and reported: "There is a very low potential discharge at varying frequencies in the right fronto-temporal region, most definite in the neighbourhood of the Sylvian point. The small size and irregular frequency of this discharge would suggest that it is vestigial and not associated with any active destructive process." On September 7 the patient felt quite well, was free from headache, and declined operation. The highly choked disks, however, were still present, and, because of these and the slight left pyramidal signs and the electro-

encephalographic findings, it was considered that he had a chronic subdural haematoma overlying the right cerebral hemisphere.

Operation.—Operation was carried out on October 3, a right subtemporal craniotomy, being performed under pentothal-nitrous-oxide-oxygen anaesthesia. When the dura was



Electro-encephalogram in a case of traumatic intracranial haemorrhage (subdural) in a man aged 20

opened a blood cyst was exposed, occupying the Sylvian fissure and overlying a large area of the cortex. Part of the cyst wall was removed and its contents were evacuated by washing with Ringer's solution and by suction through small soft rubber catheters. The cerebrum was flattened and depressed beneath the cyst, but gradually expanded to take up the space this had previously occupied. Six weeks later the optic disks were normal and the patient was returned to duty.

Commentary

Various diagnoses had been suggested, among which were tuberculous meningitis, intracranial tumour, and subdural or subarachnoid haemorrhage. On clinical grounds these were eventually reduced to haemorrhage or a tumour which might have been either in the right frontal region or in the posterior fossa, the subtentorial site being suggested particularly by the intensely choked optic disks. Ventriculography would in all probability have at once determined the location, but this was conveniently done by electro-encephalography, the great advantage of which, as Rendle Short and Miss Dunster have pointed out, is its relative simplicity and harmlessness—unlike ventriculography and aero-encephalography, which are not simple or altogether devoid of the risk of unpleasant consequences. As these writers also point out, it remains for the future to show how accurate localization by electro-encephalography will prove to be: but meanwhile it is important to record experiences of it as these are encountered. It might be anticipated that a meningeal haemorrhage (vide Rendle Short's case, previously referred to) and a subdural haematoma (case here recorded) would behave electro-encephalographically somewhat similarly because in each case the cerebral cortex is separated from the skull by a comparatively good conducting medium—namely, the haematoma. This was found to be the case by Jasper and his co-workers (1940), who point out, however, that, in contradistinction to such extracerebral collections of blood, an intracerebral haemorrhage may sometimes be detected and localized by the delta activity arising from surrounding grey matter damaged by the haemorrhage in the substance of the brain. If this is confirmed, electro-encephalography will be still more valuable in the investigation of cases of intracranial haemorrhage by providing some guide to subsequent surgical procedures.

One further feature of the case here recorded may be noted. Normal disks and normal vision are now present after a high degree of choking (approximately 5D) of both optic disks from the end of July until early in October, when the patient consented to operation. How long the retinae are capable of withstanding a high degree of choking of the nerve heads before showing signs of optic atrophy and visual impairment is an important problem still not completely decided, but among other factors the age of the patient is probably important. In this particular case the retinae of a man aged 20 were able to sustain a high degree of papilloedema for some nine to ten weeks without subsequent atrophy of the optic disks or any evidence of visual impairment.

Summary

The electro-encephalographic findings in a case of traumatic intracranial subdural haemorrhage are noted. These, together with those of the few cases hitherto described, constitute cumulative evidence of the value of electro-encephalography as an aid to the detection and location of traumatic intracranial haemorrhage.

The retinae of a man aged 20 were able to withstand high choking of the optic disks for some ten weeks without subsequent interference with function, vision returning to normal after operation and the papilloedema subsiding without signs of atrophy.

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BLOOD CONCENTRATIONS FOLLOWING LOCAL APPLICATION OF SULPHONAMIDE COMPOUNDS TO WOUNDS

BY

FRANK HAWKING, D.M.

WITH A NOTE BY

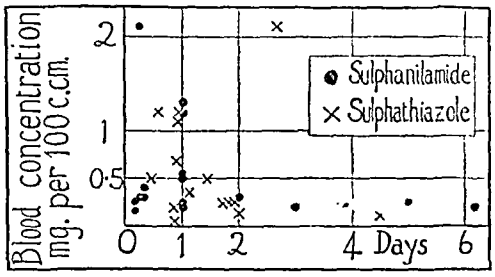
J. E. PIERCY, F.R.C.S.Ed.

The insertion of sulphonamide compounds into wounds to prevent or reduce bacterial infection is a procedure that is now widely practised, and it will doubtless become more important in the future because of its promising results and the increasing number of wounds to be treated. The present paper describes the concentration of the compound which occurs in the blood following this procedure.

The observations have been made mostly with sulphanilamide and sulphathiazole. Each compound was applied as a powder sprinkled into the wound. In fresh wounds this was done at the time of the first operation, following débridement; the wounds were then closed by primary suture whenever possible, and compound fractures were put up in plaster. These procedures were performed by the surgical staffs of the New End Hospital and of the Hampstead General Hospital. The compounds were also inserted into a number of sinuses with chronic sepsis and into large ulcers associated with varicose veins of the leg. The powder was prepared in 5-gramme lots in small glass bottles with screw caps, such as are used for bacteriological specimens; these bottles can then be sterilized by dry heat or by any other method desired for the operating theatre. The estimations of the compounds in the blood were made by the method of Marshall and Litchfield (1938). Concentrations are expressed as mg. per 100 c.cm. of sulphanilamide or of sulphathiazole respectively.

The concentration of sulphanilamide found in the blood of these patients is shown in the table and the graph: the latter refers only to cases which received a single application of the compound. The figures are irregular, as might be expected from the diversity in size and conditions of the wounds, but the blood concentration

after twenty-four hours rarely exceeded 1.5 mg. per 100 c.cm., and usually it was only 0.5 mg. or less. After the first forty-eight hours the blood concentration (with one exception) was negligible.



Discussion

These concentrations are much lower than those found by Jensen, Johnsrud, and Nelson (1939). Those workers inserted 5 to 15 grammes of sulphanilamide into 41 cases of compound fracture and observed a maximal blood concentration of 6 to 14 mg. per 100 c.cm. at eighteen hours; after sixty hours the concentration was negligible. The difference in results is probably due to the difference in quantity and identity of the compound applied and to the nature of the wounds treated. Herrell and Brown (1940) inserted 1.6 grammes of sulphanilamide as a suspension three times daily into infected pleural or peritoneal cavities and observed blood concentrations as high as 2.5 or 3 mg. per 100 c.cm.; but when the compound was applied to other sites—e.g., fractures or ulcerations—the blood concentrations were minute. It may be concluded from these results that treatment by insertion of a sulphonamide compound into a wound can safely be reinforced by oral administration, and that if the bacteriostatic effect is desired at other sites in the body, outside the wound cavity, such reinforcement is desirable.

Table showing Blood Concentration of Sulphonamide Compounds following Local Application to Wounds

Nature of Wound	Dose (gm.)	Interval since Insertion (hours)	Concentration mg./100 c.cm. Free	Total
Sulphanilamide				
Sinus in buttock (first application) ..	2.5	6	0.3	
		24	0.2	
Ditto; continuous packing over long period	2.5 (every 2 days)	24	1.2	
" " "	2.5 (tablets)	24	0.55	
		48	0.28	
Two varicose ulcers, each 3 in. × 3 in. ..	2.5	4	0.25	
		8	0.4	
		24	0.5	
Raw area 6 in. × 3 in. from varicose ulcer	2.5	4	0.15	
		8	0.3	
		24	0.25	
Wound in buttock	5	6	2.0	2.0
		120	0.25	0.39
		148	0.2	0.2
Wound in thigh	5	24	1.3	2.5
		72	0.22	0.48
Sulphathiazole				
Sinus in buttock (same as above): continuous packing over long period ..	2.5 (every 2 days)	48	1.1	1.5
Compound fracture of radius and ulna ..	3.5	21	0.04	
Fracture-dislocation of knee	3	11	0.5	
Compound fracture of tibia and feet ..	4	23	1.2	
Laparotomy wound breaking open ..	3	27	0.35	
		46	0.25	
Wound in shoulder	2.5	22	1.1	1.9
Amputation of arm	5	35	0.49	1.3
Deep wound in brachialis muscle	2.5	14	1.2	1.2
Wound of laparotomy for tubo-ovarian abscess	2.5	64	2.1	2.0
		108	0.1	
Compound fracture of tibia and fibula ..	5	21	0.2	0.2
		45	0.24	0.24
Suprapatellar wound	5	21	0.68	0.68
		45	0.24	0.24
Carbuncle	3	48	0.12	0.12
Sulphapyridine				
Two varicose ulcers, each 2 in. × 1 in. .	2.5	6	0.15	
		24	0.1	
Two varicose ulcers, about 2½ in. × 1 in. ..	2.5	6	0.1	
		24	0.12	

Of the clinical effect of this treatment it may be said, briefly, that all the cases of fresh wounds and fractures progressed excellently, while the sinuses with chronic sepsis and the ulcers due to varicose veins appear to have improved. A more detailed account of the clinical aspect is given in a separate note on the application of sulphathiazole to wounds by Mr. Piercy.

Note on the Application of Sulphathiazole to Wounds

In the past four to five months all air-raid and street casualties with open wounds (the result of falling masonry and penetrating bomb fragments, and including tissues both lacerated and burned by incendiary bombs) have been treated after débridement and removal of foreign bodies by dusting approximately 5 grammes of sulphathiazole deeply into the lacerated tissues. These injuries include compound fractures and compound fracture-dislocations. In the latter cases the suture lines also have been dusted with sulphathiazole before the plaster is applied. If the loss of skin does not permit of suturing sterile vaselined gauze impregnated with the powder has been packed into the wound. The results have been highly satisfactory, the majority of the cases healing by first intention and the temperature falling within seven days—certainly a higher percentage than we found before this practice.

The following are two illustrative cases:

Case 1.—A young girl fell from a height on to the back of her hand, sustaining a compound fracture of the radius and ulna; both proximal fragments were forced into garden earth, which had displaced upwards, and replaced, approximately one and a half inches of the bone marrow. At operation the earth was curetted out and the medullary cavity was packed with sulphathiazole; this was followed by approximation of the fragments, suturing of muscles and skin, and application of a plaster cast. At the removal of the first plaster there were two small sinuses, which soon healed. Bony union is taking place.

Case 2.—A young man with a badly lacerated quadriceps muscle opening widely into the knee-joint was treated with sulphathiazole as above. A small rubber drainage tube, however, led down to the capsule of the joint. The skin was healed by the eighth day, but the small tube had disappeared, apparently into the tissues. Subsequently a search under gas failed to find it, and the wound was resutured. Following radiography, the wound was again explored six days later, and the tube was found actually in the knee-joint. In spite of all these manœuvres the wound healed perfectly, without any evidence of sepsis or sustained rise in temperature.

Summary

Patients with wounds, suppurating sinuses, and varicose ulcers were treated by the local insertion of sulphanilamide or sulphathiazole (up to 5 grammes). The concentration of sulphonamide compound in the blood after twenty-four hours was rarely above 1.5 mg. per 100 c.cm., and usually it was less than 0.5 mg. per 100 c.cm. Consequently it seems that this local treatment can safely be reinforced by oral administration of the compound, and that in many cases such reinforcement would be desirable.

Grateful acknowledgments are due to the superintendent of the New End Hospital, the Hampstead General Hospital, and the respective surgical staffs for permission and assistance in observing these patients; to Messrs. May and Baker and Burroughs Wellcome for supplying the compounds; and to Dr. A. T. Fuller and Miss M. Kuck for assistance with the chemical estimations.

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PNEUMOCOCCAL SEPTICAEMIA WITH RECOVERY

BY

J. ELLIOT MURRAY, M.D., Ch.B.

AND

S. ORAM, M.B., B.S., M.R.C.P.

Excluding the transient bacteriaemia of lobar pneumonia very few instances have been recorded of pneumococcal septicaemia, proved by blood culture, in which a cure has been obtained as a result of giving sulphapyridine. The case to be described presents sufficient unusual features to make it worth publishing.

Case History

The patient, an Army officer aged 39, was wounded on May 20 1940, in Norway by flying bomb-splinters, and received a severe laceration of his left calf and a small wound below the left patella. No fracture was sustained. He was admitted to a Liverpool hospital, and the infrapatellar wound completely healed within six weeks. The calf wound was treated by débridement and plaster, and after four months the plaster was removed and replaced by elastoplast. Although this wound had not quite healed the officer was allowed to go home to the South of England as an ambulant patient on November 18. For the first five days of his leave he felt very well, but at midnight on November 23 he suddenly developed a rigor and much retching occurred. The following morning his temperature was 103° F. and a heavy cloud of albumin was present in the urine. A tentative diagnosis of acute pyelitis was made and appropriate measures were instituted. No dysuria was present. Early on the fourth day of the illness the patient noticed a slight sore throat, and this rapidly became worse. On November 28 he was admitted to our hospital.

On examination he was found to be nearly moribund, with a temperature of 106° F. A short time after admission a rigor occurred. His throat was almost uniformly injected, possibly slightly redder in the left peritonsillar region, but no membrane was present. There was a concomitant bilateral cervical adenitis. The calf wound was almost completely healed, but a little thick greenish pus was seen. No cellulitis was present and no crepitus was obtained. There was no tenderness over the kidneys or in the hypogastrium, and although his urine showed a heavy cloud of albumin and was strongly acid the guaiacol test was negative. The spleen was not palpable. The heart sounds were distant and tic-tac rhythm was present together with some degree of cardiac dilatation. The blood pressure was 108/76 mm. Hg. His other systems were normal.

Four 0.5-gramme tablets of sulphapyridine (M & B 693) were given immediately, followed by two tablets four-hourly.

Pathological Investigations

"*Throat Swab.*—Pneumococci predominate. Non-haemolytic and other organisms present.

"*Direct Smear from Wound.*—Pneumococci predominate. On culture pneumococci and a Gram-negative bacillus, possibly *B. friedlanderi* were grown.

"*Blood Culture.*—Culture shows a pure growth of pneumococci.

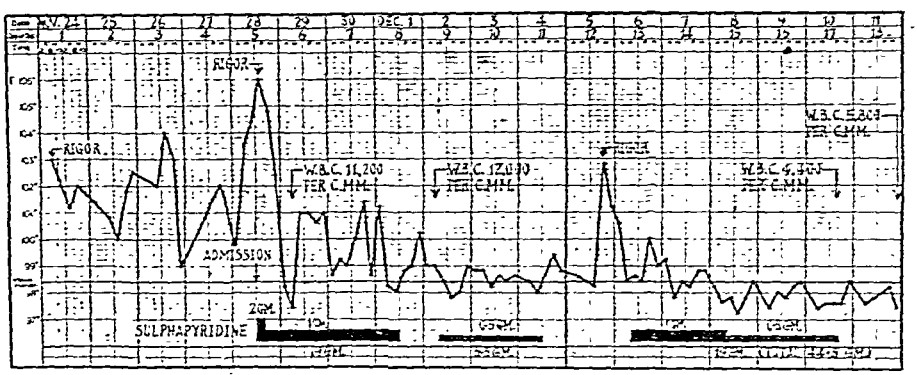
"*Urine.*—Acid reaction, albumin + —, sugar *nil*, acetone *nil*. Deposit: one granular cast, one or two leucocytes and epithelial cells, and a few coliform organisms, not in excess.

"*W.B.C. Count.*—11,200 per c.mm.—polymorphs, 87.2%; lymphocytes, 11.6%; basophils, 0.4%; eosinophils, 0.8%.

"*Radiograph.*—The contour of the left ventricle is suggestive of a degree of dilatation. The lung fields are normal."

Progress

On the morning following the day of admission a small swelling about an inch in length and half an inch in width suddenly appeared in the long axis of the inner aspect of the right forearm. It was red, tender, warm, and indurated. Local heat was applied and by the next morning no trace of this swelling could be found, but another swelling had appeared between the lower border of the thyroid cartilage and the suprasternal notch. This was more diffuse and more tender than its precursor, and extended beneath the left sternomastoid muscle. The overlying skin was red and oedematous but not adherent. No fluctuation was obtained. This was an acute diffuse thyroiditis. Antiphlogistine was applied over the swelling, which became more brawny during the next few days and then gradually disappeared.



By December 1, as the temperature had fallen to normal and the patient had received 19 grammes of sulphapyridine, an attempt was made to stop the drug, but by the same evening the temperature had risen to 100.2° F. A W.B.C. count the following day showed a total of 12,000 per c.mm., so sulphapyridine, one tablet four-hourly, was restarted. Two days later a second attempt was made to stop the drug. The day after doing so, however, the temperature rose to 102.8° F. and a rigor occurred, so a reversion to the original dosage was made. This time the drug was continued until the temperature had remained normal for three days. In all 44.5 grammes of sulphapyridine was given, and by now a moderate leucopenia had resulted, the white cells numbering 4,400 per c.mm.; by the next day this figure had already risen to 5,800 per c.mm. The albuminuria gradually decreased, and was quite gone by December 7.

Commentary

The heavy albuminuria and pyrexia with rigors suggested pyelitis, but that diagnosis was contradicted by the absence of appropriate clinical signs and of pus or organisms in the urine. The albuminuria presumably resulted from the fever.

As the pus from the wound yielded pneumococci, as did the throat and blood stream, it was thought that the primary focus was the calf wound, although six months had elapsed since the wound occurred and no history of recent trauma was obtained. It was considered unlikely

that the inflamed throat was the origin of the infection because this lesion followed four days after the raised temperature. Unfortunately no smear from the wound was taken soon after the injury.

Presumably the transient swelling in the forearm and the thyroiditis were septicaemic manifestations. The appearance of the thyroid closely corresponded with the description given by Giordanengo (1938), who states that only 54 cases of acute non-suppurative thyroiditis have been recorded.

During the administration of sulphapyridine no precautions were taken regarding sulphur-containing foods or drugs and no cyanosis occurred—in fact, the patient felt extremely well after the first few days and no nausea was experienced at any time. Radley Smith (1940) has shown how completely unjustified is the fear of administering sulphur-containing compounds during sulphapyridine therapy. The only substance which it is necessary to restrict, at least for the first few days, is water. This is often overlooked. It is impossible to obtain the optimum concentration of 10 to 15 mg. of sulphapyridine per 100 c.cm. of blood if the patient is allowed fluids *ad lib*. It is surprising that in such a debilitated patient the white cells did not become more greatly reduced. Young (1937) has stated that especial care is necessary in such ill patients, and has shown how inadequate a safeguard are frequent blood counts, since preceding counts often give no indication of the imminence of complete and fatal agranulocytosis. As it was, the total amount received by our patient was very near 50 grammes, which is considered by Sutherland (1939) to be dangerous. The individual susceptibility of patients must vary very considerably.

In all the cases we can trace there has been a delay of several days, due to difficulties in diagnosis, before the administration of sulphapyridine has been started. Bonorino Udaondo and Pinedo (1940) waited five days, and Southwood and Magarey (1940) did not begin chemotherapy till the seventh day, and in each case a cure was obtained. In both of these cases, as in our own, the drug was stopped too soon and had to be repeated.

Summary

The interesting features of this case appear to be:

1. The isolation of pneumococci from a leg wound, the throat, and the blood stream, and the long latent period of six months from the original wound to the onset of septicaemia.

2. The transient nature of inflammatory swellings in the arm and neck, which subsided without surgical intervention.

3. The relatively large amount of sulphapyridine (44.5 grammes) necessary to maintain a normal temperature, and the absence of any ill effects.

4. The long delay of four days before starting chemotherapy and the rapid and complete recovery of the patient.

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F. E. Norris (*Brit. J. Inebriety*, 1941, **38**, 112) states that the relation between alcoholism and crime is becoming an academic question and is now less important in the consideration of the causes of crime as a whole than formerly. Criminals in this country are not commonly addicted to alcohol and are not greatly concerned by its withdrawal after admission to prison. They rarely attribute their delinquency directly or indirectly to alcohol. In cases where there is a recognizable relation between alcoholism and crime the offences committed are only some types of sexual offences rather than the much commoner offences against property.

Clinical Memoranda

Amnioplastin as a Conjunctival Graft

This case is reported because we consider that amnioplastin has some advantages over mucous membrane grafts and possibly, too, over de Rötth's (1940) whole foetal membrane grafts, in that it is always available, is easily sterilized, and on account of its amorphous character lends itself admirably to conjunctival repair. Furthermore, it does not necessitate an additional wound at the graft source. It is suggested, therefore, that this might be a useful adjunct in the repair of civil and military eye wounds at the present time.

CASE RECORD

A quarry worker aged 54 sustained an injury to the strip region of his left lower lid by a fragment of stone in August, 1939.

When first seen, four months later, at the out-patient department of the Aberdeen Royal Infirmary he had a somewhat sessile mass on the middle of his lower eyelid conjunctiva measuring 7.5 mm. by 5.5 mm., and infiltrating the base of the lesion was a bead of dark pigment. Radiographs failed to reveal any foreign body, and no enlarged nodes were palpable.

It was decided, as a preliminary measure, to implant the area with radon seeds, giving 6,000 *r* at a distance of 0.5 cm. from the skin surface, and this was carried out on January 19, 1940. Biopsy taken at the time of implant showed the growth to be a malignant melanoma with an admixture of septic granulation tissue. Soon after treatment all the pigmentation disappeared, but at the end of five months, during which the patient was kept under close observation, a faint brown spot reappeared in the treated area and there was still some residual thickening of the centre of the eyelid. This was regarded with suspicion, and it was thought advisable to excise the lid. Actually no trace of malignancy was found in the tissue on microscopical examination following its removal, though metastases and secondary glands became evident before the end of the year.

On June 18, under evipan anaesthesia, the lower lid was excised medially as far as the lower punctum and inferiorly to beyond the lower fornix. Amnioplastin was used to replace the conjunctiva, being prepared and sterilized by boiling to obtain the maximum shrinkage before use, after the method suggested by Chao, Humphreys, and Penfield (1940). A flap of the membrane was sutured to the lower edge of the cut ocular conjunctiva and also to the skin at the lower edge of the wound, so as to make a deep fornix. The free end was then reflected upwards and sutured to the upper border of a pedicle flap from the left temple which was swung over to form the new lower lid. It will thus be seen that the lower lid was replaced and the space between the graft and the eyeball was lined by a double fold of amnioplastin.

During the next few days the only treatment carried out was the instillation of cod-liver oil drops into the eye and the covering of the whole wound area by saline soaks. Healing was satisfactory, and in just over three weeks the base of the pedicle was cut, the amnioplastin and graft having taken well.

When seen three months later some shrinkage of the artificial conjunctiva had taken place near the outer canthus, causing a symblepharon, which, however, has given no discomfort. The inner part of the fornix was of fair depth. No attempt had been made to prevent symblepharon during healing, as is commonly done, by passing a glass rod round the fornix.

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Aberdeen Royal Infirmary.

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TWO BRITISH PREPARATIONS FOR

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thought and practice in America. The whole volume is well supplied with references, there are many valuable illustrations, and the index is good. Search in various sections chosen at random has revealed that the essential practical nature of the earlier editions has been well maintained. A curious omission discovered by chance is the absence of any reference to eumydrin for congenital pyloric stenosis. One other criticism is that the section on nutritional requirements appears to be very complicated and hard to read, probably because too much material has been condensed into a relatively short space. In general, however, this can be welcomed as a first-rate contribution to medical literature.

ELEMENTARY EXPERIMENTAL PHYSIOLOGY

Experimental Physiology for Medical Students. By D. T. Harris, M.D., D.Sc., F.Inst.P., Professor of Physiology, London Hospital Medical College. Third edition. (Pp. 292; 248 illustrations and plate in colour. 15s.) London: J. and A. Churchill. 1941.

The third edition of this book, originally based on the intermediate medical course in physiology at University College, London, continues the valuable service rendered by previous editions. Any student who follows it through will have obtained a good introduction to the methods used in physiological inquiry, and it can be recommended to any teachers of the subject as a basis on which to build courses suitable for their own departments.

The book contains several new features, notably a rewriting of much of the chapters on the analysis of the respiratory gases and of the blood gases. On the whole these chapters have been much improved, but it is unfortunate that the Van Slyke manometric apparatus is only mentioned incidentally, and then in the form of an elaborate modification which has found little general application. It receives no mention in connection with blood gas analysis, though the Van Slyke volumetric apparatus is described. The sections dealing with tissue respiration, with special senses, and with pharmacological experiments have also received notable additions and improvements. Some new electrical apparatus will please those interested in wireless technique—for example, a neon tube stimulator, thyratron stimulator, L.F. oscillator, amplifiers, etc., but it may be doubted whether the information given about them would be of any use to the inexpert. The figures are clear and well selected, the only thing to cavil at being that the commercial illustrations of apparatus are taken from too narrow a field of makers. The printing and general get-up are all that we are accustomed to expect of Messrs. Churchill.

VERTEBRATE HISTOLOGY

The Microscopic Anatomy of Vertebrates. By James I. Kendall, Ph.D., D.Sc. Second edition. Thoroughly revised. (Pp. 342; 197 illustrations. 17s. 6d. net.) London: Henry Kimpton. 1940.

The second edition of *The Microscopic Anatomy of Vertebrates*, by Dr. James Kendall, is a revision with additional illustrations of the previous edition. The original purpose of the book was to provide a practical knowledge of the microscopic anatomy of vertebrates, founded on representative types of the various classes. The material which has been made use of has thus been derived from such types as the dogfish, Necturus, lizard, pigeon, rat, rabbit, cat, or dog. References have been made to other types, where necessary, and certain facts of comparative anatomy have been introduced, which add to the general interest of a purely structural description of the tissues. The systems and organs have been dealt with in an orderly manner, which facilitates reference, but, as sometimes happens, the strict adherence to plan has in some places led to much repetition. The introductory chapters will be especially valuable in assisting beginners, by means of stereodiagrams placed side by side with photomicrographs of the same tissue, to interpret the different appearances produced by variations in the planes of section. The author has not attempted to do more than give a general description of microscopic anatomy, and has accordingly relegated the more detailed study of certain structures, such as the brain, sense-organs, or endocrine glands, to special works in which these subjects are dealt with from the standpoint of human or comparative anatomy, in a much more exhaustive manner than is possible in a textbook limited to a general survey of the basic principles of microscopic anatomy. The author has, however, provided for this contingency by giving a valuable selection of references to the literature on the several systems, which should prove to be an assistance to further study of the particular organs and systems. There is an excellent concluding chapter on the technique of preparing sections, which contains the practical information indispensable for the laboratory worker.

The book may be highly commended as an introduction to the study of vertebrate histology and as an incentive to further study.

Notes on Books

Like many another medical man, Mr. ANDREW RUGG-GUNN has fallen under the spell of Egyptology. In his *Osiris and Odin: The Origin of Kingship* (H. K. Lewis and Co., Ltd., 8s. 6d. net) he shows himself as an avowed "diffusionist" of the Elliot Smith school. After reciting the myth and cult of Osiris he maintains that in his migration northward this god became the Odin of Scandinavia. This view necessitated dating the introduction of Odin worship by many centuries earlier than is ordinarily done, but the author makes out a good case for so doing. A specially interesting contribution to his thesis is the map showing that the route of this migration was used on a return journey by the traffic from Jutland of the "life-giving" amber to Apollo's island of Delos. But more than amber took this journey, for if Mr. Rugg-Gunn's view is correct, Osiris, transformed into Odin, must have come back again as Zeus, accompanied by other northern deities who were established on Olympus when the Achaeans from the north invaded the Mediterranean countries. This is a point, however, which he does not raise. Agriculture, kingship, religion, form the tripod on which the Osiris and Odin cults alike rest. Mr. Rugg-Gunn traces our present discontents to the depreciation of those values, and makes an impassioned appeal for their restoration. Not everyone will agree with all the views expressed in this interesting book, but no one will question the author's deep sincerity. Incidentally a number of rather striking suggestions are made, such as that the present position in Italy is a revival of dual kingship, which has never been long in abeyance in the history of that country that in the United States society appears to be reverting to the matriarchal system, and that much of our coronation symbolism is drawn from the rites of Osiris. Altogether a pleasantly stimulating book.

A copy of the *Collected Papers from the Middlesex Hospital*, published during 1939–40, has been received from the cancer and general research committee of the hospital, and can be consulted in the Library of the British Medical Association.

For the sixteenth edition of the popular *Black's Medical Dictionary*, by the late Dr. J. D. COMRIE, extensive revision has been made and new sections on the ductless glands and on the sulphonamides added. The special wartime supplement on air-raid casualties which was included in the previous edition has also been revised in the light of practical experience. The publishers are A. and C. Black, and the price is 20s.

Preparations and Appliances

USE OF THE ROTARY PUMP IN INTRAVENOUS THERAPY

Mr. G. M. ARNOTT, resident surgical officer, Children's Hospital, Birmingham, writes:

The technique described below has in my opinion proved to be superior to the more common methods of administering fluid intravenously. The fluid can be given at an accurate speed, from a slow drip to a continuous stream under pressure, and is introduced by siphonage, making elaborate containers unnecessary. These advantages are effected by the use of Riddell's rotary pump.

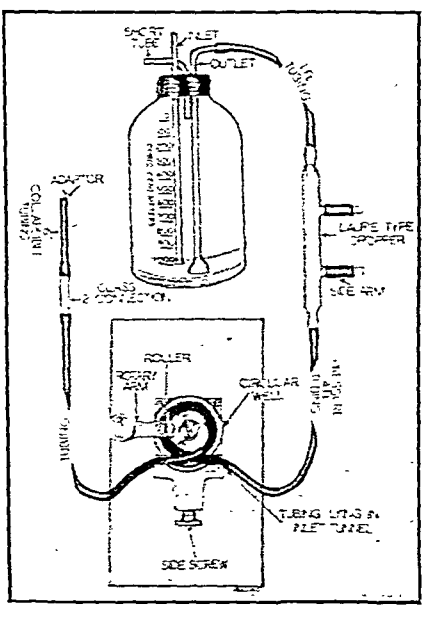
Mechanism of Pump.—The pump is constructed of metal and has an ingenious but simple mechanism. There is a "circular well," a section of which moves radially on turning the "side screw," either opening or closing the well. Within the well is the "roller," carried by the "rotary arm." By opening the well and manipulating the rotary arm the pump is easily charged with a turn of rubber tubing, the supply and delivery ends fitting in their appropriate tunnels in the wall. The tubing will lie with the wall of the well on its outer side and be compressed by the roller on its inner side. If the well is now closed, rotation of the arm will set the pump in action. A continuous wave of compression is exerted on the turn of tubing by the rotating roller, giving a positive pressure ahead and a negative pressure behind. When the rotary arm is in "neutral" the roller is opposite the centre of the movable section, and with the well closed the tubing is compressed and clipped off at this point. The lumen of the tube is re-established to any degree by turning the side screw and opening the well, providing an accurate drip-regulator.

Outfit.—The apparatus, which may be arranged as a portable unit, is assembled as follows (see diagram):

A wide-necked bottle, capacity 1,000 c.cm., containing the fluid to be administered, is fitted with a rubber bung, pierced by three lengths of glass tubing, two reaching to the bottom of the bottle and the third stopping short of the 1,000 c.cm. level. One long tube, the outflow, has its lower end shaped like an inverted thistle funnel, diameter 3/4 in., to act as a filter when covered with a few layers of sterile gauze. The second long tube is the inlet when taking blood or using filtered oxygen as an agitator. Pressure is equalized through the short tube, which is open in all procedures.

To the outflow are connected in series: (*a*) 1 ft. of rubber tubing. (*b*) A glass dropper of the Laurie type. The bulb should be 1 1/2 in. to 3/4 in. in diameter and about 6 in. long. If the column of fluid in the bulb tends to rise and obscure the point of the dripper the tubing above is clipped and a side arm on the bulb opened. When the required fluid level is reached the side arm is closed and the drip restarted by releasing the tubing. (*c*) 4 ft. of pressure tubing, outside diameter 9/32 in. This type and size of tubing must be used in the pump, which is threaded with this length. (*d*) a 2-in. glass connexion. (*e*) 4 in. of collapsible tubing. (*f*) An adaptor. All adaptors, cannulae, and needles should be of standard Record fitting, preferably with bayonet catches.

Venepuncture and Venesection.—Both in emergency work and in infusions lasting up to about six hours venepuncture is the procedure of choice if the veins are suitable; otherwise venesection must be performed. In either case an appropriate head of pressure is obtained by placing the container 2 to 3 ft. above the vein. The siphon is established with a clear fluid, an important point in performing venepuncture. If blood or plasma is to be given the bung is removed from the container and the filter immersed in saline, which is pumped through the tubing until all air is expelled and an even flow comes from the adaptor. The dropper meanwhile is held upright to obtain a suitable level of fluid in the bulb. When this has been completed the pump is stopped and the bung, if removed, is replaced in the container, care being taken not to shake the tubes and introduce air-locks. The container is placed in position. In venesection the adaptor is now attached to the cannula and the flow started by slowly rotating the arm of the pump two or three times, finally stopping in neutral. The drip will start and its speed be regulated by relaxing the side screw. In venepuncture the needle is attached to the adaptor while the siphon is being established and the bung fitted in the container as before. The skin over the chosen vein is prepared and, steadying the vein between the second and third fingers of one hand, the needle, held in the other hand, is introduced under the skin.



The rotary arm is reversed a few turns and the collapsible tubing will deflate. The operator watches the glass connexion, and when the vein is entered the reflux of blood will at once appear in the window. The needle is strapped in this position and the infusion started as before. Temporary distension of the vein will facilitate the operation, and in difficult cases a very small skin incision may prove helpful. A No. 16 S.W.G. needle with a short sharp bevel is used.

Advantages of the Method.—The advantages of having the pump in the circuit can now be considered. All drips are prone to slowing or stopping, and if a rapid inspection reveals a correct head of pressure, no obstruction in the filter or tubing, and no external pressure on the vein, the hold-up is in the cannula, the most frequent site. The difficulty is overcome by closing the well and pumping through a few cubic centimetres, which will clear the cannula, and the drip can then be restarted. During a drip infusion a few turns of the pump hourly will give an even flow. In slow drips the accuracy of a volume control can be maintained only by keeping the inlet clear. With the one apparatus fluid can be given at any desired speed, and the rate of flow can be accurately maintained. Plasma is now being more widely used, and the pump simplifies this type of therapy.

Taking Blood.—Finally, the outfit provides a simple method of taking blood and renders this operation possible under most conditions. The technique is the same as that described for venepuncture, the dropper being excluded and the pumping reversed. The citrate is pumped into the container through the long straight tube, the vein is entered, and the blood is withdrawn in an even flow.

"Varistab": Corrigendum

By a slip of the pen the name of Messrs. Boots's new product "varistab" was misspelt in our issue of March 15 (p. 406).

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DISTRIBUTION OF AIR-RAID CASUALTIES

Recent correspondence in the *Journal* has drawn attention to a problem that has been exercising the minds of those responsible for the treatment of air-raid casualties in hospitals—namely, the delay in the treatment that occasionally occurs owing to the fact that one hospital is overloaded with work whilst another closely adjacent remains empty and idle. That this is not in the best interests of either the injured or those who have to treat them will be disputed by no one. It is not, however, clear how far this experience is general, nor is it easy to determine the causes of this inequality of distribution or, having determined them, to find a remedy that can be applied easily and quickly. It is one thing to draft a perfect scheme on paper and quite another to follow out in the actual conditions of a raid the details that appear so clear and simple on a cool page of print. The ambulances that arrive at an incident have to work in darkness and danger and in the expectation that their journey to one or more hospitals may be blocked as a result of bombing. Once, therefore, a clear path has been found leading to one particular hospital, it is only natural that subsequent journeys should be made along the same path unless orders are given to move off in other directions. Again, the pride of service which is characteristic of the voluntary hospitals of this country makes the hospital staff eager to take in more and still more cases, and reluctant to admit that its capacity is becoming overstrained. As a well-informed correspondent points out (p. 526), the ideal system for surgeon, physician, and patient would be for all the casualty services to work under the same direction as the hospital service. Control in any given district should have absolute authority during a raid to direct the activities of the varying components of the casualty services. Control should be the central co-ordinating nervous mechanism, receiving messages from the outside and, after quick use of its association fibres, issuing clear instructions for action. To what extent has Control this power, and to what extent is it inhibited from using it? How far is conflicting authority responsible for lack of co-ordination between the casualty services and the hospital? These questions should be asked and be answered, for there can be no doubt that the time that elapses between the sustaining of the severe injury and its treatment is one of the most important factors in determining recovery. Within six to eight hours, as our correspondent points out, bacteria in a wound can be effectively dealt with by the customary surgical toilet. We would not be thought to detract from the admirable and heroic work that has been done in rescuing and treating those who have been injured in circumstances that are without precedent in our history, nor would we suggest that the bad results of delayed treatment are on anything but a small scale. But apart from the human aspect, the quicker and more efficient treatment of, say, 10 casualties in every 100, and the possible saving of one additional life in a hundred, is something that everyone concerned in the casualty services must aim at and achieve, by tightening up the system that exists until it is as nearly perfect as we can make it. The principles upon which the taking in of stretcher cases is based and their bearing upon ambulance arrangements are being carefully studied by the Ministry of Health, and will no doubt be embodied in future instructions. The distribution of casualties from major incidents should then be carried out in a more satisfactory way.

Until a complete co-ordination of casualty services does exist, the hospitals must themselves take steps to ensure that no casualty receives treatment too late because of faulty organization or because of reluctance to admit that it can no longer deal with additional cases with the existing staff and equipment. The officer in charge of a hospital during a raid should make every effort to anticipate the moment when the burden of work will become excessive, and should send out well in advance of that moment a call for the help of a relief surgical team. It is obviously not possible for him to turn away casualties once they arrive in the hospital, but it is unfair to both the hospital staff and the patients to hesitate to ask for assistance. If, owing to faulty organization, the casualties are all sent to one hospital while a near-by hospital remains empty, then the only thing to do is to ask the latter to supply an additional team. There is no virtue in delaying to seek for such help, nor, we feel sure, will there be any lack of response. The visiting team, however, cannot be expected to give its services willingly or efficiently unless the fullest preparations have been made for receiving it, and it is the responsibility of officers in charge of casualty hospitals to see that preparations are made down to the last detail, with a clear conception on the part of everyone of their duties in assisting and informing the visiting team of all the routine matters of their own hospital with which they are so familiar. Many hospitals, of course, have well-devised emergency machinery smoothly running for this purpose. It remains now to see that every hospital reaches the same pitch of excellence. Before the full operating capacity of a hospital has been reached, for ambulances are still on their way, the moment comes for what has been graphically termed "switching," in order to divert the further flow of casualties to other hospitals. As the mechanism for switching still has flaws in it, there is all the stronger reason for planning the internal arrangements of the hospital with the care and thoroughness which the surgeon shows in his operative technique. This and many other points are described in the article at page 526.

There is one other aspect of the treatment of air-raid casualties to which brief reference may be made, and that is the provision of an alternative hospital service when bombing is so intense as to put out of action a large number of hospitals in the centre of a big city. In such circumstances it is obvious that use must be made of hospitals at the periphery of the town or in the country beyond it, and it will remain with Control to give the signal to divert all casualties to the second

r even the third hospital line of defence. For xample, a factory district, railway centre, or dock rea may be severely attacked, and it is not uncommon or one or more of the chief hospitals of a city to be ituated in these areas and involved in the attack. If he damage is so great that the hospitals can no longer arry on, then the next hospital line of defence must ome into action. Even if work is still possible at he bombed hospital in a dangerous area, conditions nay be such that it is impossible or even imprudent to onvey into it casualties from less dangerous areas of he city. Apart from the risks to the patients of such course, there is also the risk to the personnel of the asualty services. In any event it would seem desirable for hospitals situated in dock or industrial areas o receive only casualties resulting from incidents in hose areas, and not from the less vulnerable parts of he city, casualties in which should be moved to the eripheral hospitals. If all the hospitals at the periphery are themselves bombed, then the third line of defence, of auxiliary hospitals and buildings selected in advance as reserves, will have to be used, or provision may have to be made for the erection of huts or tents to serve as emergency accommodation. It is important that the working of the alternative hospital scheme or schemes should be familiar to main Control, Sub-Control, depots, aid posts, and ambulance officers, drivers, and attendants. Hospitals which have been bombed may nevertheless still have much of their essential equipment untouched, and some time ago instructions were issued that plans for its removal should be prepared. Transport difficulties in such circumstances can easily be visualized, and hospital authorities have been asked to consider in advance the minimum essential equipment and stores to be removed immediately if the hospital is to carry on in improvised buildings; a second list of less essential equipment should be ready, so that this can be moved later when transport facilities have improved. Many hospitals in the country already have these details worked out to the last safety-pin.

REHABILITATION OF THE INJURED

In the years preceding the war much attention was being given to the problems concerned in the restoration to working capacity of persons injured by accident. This was in part due to a growing appreciation of the economic wastage associated with dilatory and inefficient treatment of fractures, for in Great Britain, on a conservative estimate, some 200,000 fractures were being treated each year in peacetime. A comprehensive report by a special committee of the British Medical Association in 1935 was followed by the appointment of an Interdepartmental Committee of the Home Office and Ministry of Health, which announced its findings in interim (1937) and final reports (1939). There was unanimous agreement on the following principles: segregation of patients with fractures, continuity of treatment from the time of the fracture to the final stage of rehabilitation or reconditioning, and unity of control throughout the whole period of treatment. The Interdepartmental Committee in its final report stated that special "reconditioning" centres would be necessary for a minority of patients treated in organized fracture departments, and various schemes were suggested. It is generally agreed that the majority of patients with fractures—children, housewives, and sedentary workers—require no special rehabilitation other than that provided by the physiotherapeutic department of a hospital—for example, heat, massage, active exercises both individually and in classes, and, in certain circumstances, electrotherapy.

It cannot be emphasized too strongly that the process of preserving and restoring function (that is, rehabilitation) begins with the initial treatment of the fracture. On another page Mr. E. A. Nicoll rightly makes this point, and indicates in a highly informative article many useful ways of preserving maximum function during the period of immobilization until the fracture has united. There is, however, a small proportion of patients, particularly those suffering from industrial injuries, for whom the gap between the stresses of such remedial activities as a hospital massage department can provide and the stresses of full heavy work should be bridged by a final period of reconditioning treatment. The aim is to subject the patient through graduated work to the full stresses of his original occupation while under constant medical supervision. This constitutes the argument for the creation of rehabilitation centres such as the Midland Counties Rehabilitation Centre for Miners at Berry Hill Hall, the work of which is so clearly described by Mr. Nicoll. As he says, rehabilitation is not to be confused with vocational training, which is the quite different and numerically smaller problem of training in new work a man who is permanently incapacitated from following any work in his former trade. The results obtained at those highly specialized centres, each of which deals only with the injuries of a particular trade—for example, Berry Hill Hall (miners), L.M.S. Railway Hospital at Crewe (railwaymen), Albert Dock Hospital, London (sailors)—and each of which is run by a surgeon and team familiar with every kind of work in that trade, appear to provide very strong support indeed for those who urge the provision of such centres on a larger scale. It is still a problem how best to organize these centres. Should they be planned on a regional basis and each centre be available to serve all trades? Or should each large industry have its own centre or centres? The latter method is the only one so far adequately tested, and its success appears to be proven.

Many surgeons experienced in industrial injuries feel that rehabilitation is best effected through the medium of "light" work. There is no doubt that in certain circumstances this is an admirable method, and it has been employed with the happiest results for many years by Dr. O'Neill Sherman of the Carnegie Illinois Steel Trust. He is able to insist, as soon as he considers a man fit for any form of work, that suitable work is provided and that the man remains under his or his team's observation. Somewhat similar facilities are provided by a few industries in this country, but, as Mr. Nicoll points out, "light work if it is to be of any remedial value must be selected, supervised, and graduated by the surgeon, just the same as any other form of occupational therapy. In actual practice, light work usually terminates the surgeon's connexion with the case." Moreover, the ability of an injured work-

man to do "light work" provides more often than not an excuse for depriving him of a substantial amount of compensation without the provision of suitable employment. As the Workmen's Compensation Act stands at the moment it is often difficult to prevent the development of an anxiety neurosis, with resulting persistent disability for the injured workman. It is natural that a man with family responsibilities and dependent for his living on his own manual efforts should be apprehensive about his future capacity to earn an adequate living, and more comprehensive information on this problem would be welcomed from established rehabilitation centres. It is quite certain that malingerers and deliberate seekers after exaggerated financial compensation form a very small proportion of injured workmen. It is surely not outside the scope of legal ingenuity to alter the Workmen's Compensation Act so that anxiety of the type alluded to above should not be added to the physical difficulties of rehabilitation. No doubt appropriate suggestions will be made by the Royal Commission on Workmen's Compensation to which the subject was referred, and these, it is hoped, will ensure that the workman is able to take a more rational view of his injury.

Who should decide when the man is fit to return to work? It seems unfair that this decision should be left to one surgeon, however expert he may be. The present system appears more just to the workman, though the abolition of the undignified wrangling between the medical and legal professions in open court would be welcome. Would it not perhaps be better to arrange for an efficient medical committee to represent all interests, whose decision would be accepted by employer and employee as final? It is clear that rehabilitation centres on the present model have justified their establishment, and it is to be hoped that employers and workers, and their respective organizations, will continue united and co-operative efforts to prevent wastage of man-power and money which could well be used for other purposes.

MEDICAL USES OF RADIUM

The Medical Research Council's series of reports on the medical uses of radium has been interrupted by the war, and the majority of the radium centres have been unable to compile their usual statistical summaries of the results of treatment. Experimental work, however, is continuing, and reports of this have recently been summarized by the Joint Radiology Committee of the Medical Research Council and the British Empire Cancer Campaign.[1] At the Imperial College of Science and Technology the bombardment of a spherical shell of uranium oxide by neutrons from a radium-beryllium source at the centre of the sphere produced secondary neutrons in excess of the number of primary neutrons captured from the source. An attempt is now being made to start a chain reaction; by using these secondary neutrons it is hoped to get further neutrons by fission in excess of the number lost in the process. St. Bartholomew's Hospital is producing radio-active sulphur for biological investigations. Evacuation of the pre-clinical students to Cambridge has meant that the Cavendish Laboratory cyclotron could be used in this work, and the difficulty of detecting the very soft beta radiation of radio-active sulphur has been overcome. A knowledge of the metabolism of sulphur in the skin is likely to throw fresh light on the skin reactions to radiation. Thus the report from the Mount Vernon Hospital shows that soft x rays (117 kV) have a much greater effect than gamma rays on the tails of mice when equal physical doses are administered under identical conditions. The explanation may be that the photo-electric emission of sulphur produced by the soft x rays is six times greater than that produced by gamma rays. Both the Royal Cancer Hospital and the Radium Beam Therapy Research Centre have continued their work on the spatial distribution of radiation within the body. By the contour projector the dose at any point from any number of converging beams can be estimated, and the volume of tissue which is raised to any given dosage level can be defined. Taking the co-ordinates of any point and computing the dose from previously prepared charts is a more laborious method, but it has contributed materially to the improvement of the 10-gramme radium unit technique. The Radium Beam Therapy Research Centre has also made small condenser chambers of a mixture of bakelite and graphite, with a small addition of titanium, which are independent of wave-length over a wide range. As the chambers are easily made several hundreds can be used simultaneously in a Presdwood phantom for determining isodose charts.

The Strangeways Laboratory has shown that the effects of radiation can be quantitatively estimated by means of mitotic and degenerate cell counts. To obtain the best results when divided doses are used the second radiation should be given when the effects of the first exposure are wearing off. With the material used, the optimum spacing after an initial dose of 82 r was eighty minutes, but with an initial dose of 268 r the optimum spacing was found to be ten days. Thus the duration of the biological change would seem to be proportional to a very high power of the dose, a result which leads to interesting speculations. For example, as the lethal effect of radiation is always represented by a sigmoid curve, it has been difficult to imagine what happens to the few cancer cells which necessarily survive, even in a "cured" case, no matter how big the dose. If, however, the above proportions hold for large doses the effects of a dose of several thousand r may take years to wear off. It has been found by the same quantitative methods that gamma rays ($\lambda_{eff.} = 0.014$) are only half as effective on tissue cultures of chick fibroblasts as x rays ($\lambda_{eff.} = 0.107$, 0.150, and 0.363 A.U.), no difference between the three wave-lengths of the x rays being detected. Linking these results with similar studies on neutrons, workers have found that for ion densities above about 5×10^4 per cm. the biological action is independent of ion density, and that below this value it diminishes rapidly as the ion density decreases. Where, however, it is the outcome of a single successful ionization—for example, the lethal action on bacteria—it increases with increasing ion density. The same kind of explanation is put forward by the Edinburgh Institute of Animal Genetics for the fact that the production of gene mutations in the spermatozoa of *Drosophila* is independent of both the intensity and the fractionation of the dose of radiation. A gene mutation, like the bactericidal effect, is the result of a single successful ionization, and the total hereditary effect is thus directly proportional to the total dose received during the life of the cell. The relation between the life of a cell and that of the individual is not well known, but the results are obviously of importance to all whose work exposes them to radiation. The frequency of structural changes in chromosomes also depends only upon the total dose received, as no reunions of the broken pieces take place in the spermatozoon before fertilization; but as at least

[1] *Brit. J. Radiol.*, 1941, 14, 1.

two chromosomes must be broken for a structural change to occur the effect is proportional to about the 1.5 power of the dose, approaching the square of the latter with very small doses. In ordinary cells, where there is no block to the fusion process like that existing in spermatozoa, some restitution of broken chromosomes will occur, so that division of the dose over a period of time will result in fewer structural changes. The maximum chromosomal changes will thus be obtained by concentrating the dose into a short period of time.

EFFECTS OF SEVERE CALCIUM DEFICIENCY

The general effects on the growing organism of deprivation of calcium have been known for some time, but the recent studies of Kleiber, Boelter, and Greenberg[1] have brought out many new and interesting facts. Young rats were given a diet containing only 9 mg. of calcium per 100 grammes of food but adequate in all other respects. The caloric value of this diet was about 5 calories per gramme, and it would supply a child of 5 years, consuming 1,500 calories, with only 27 mg. of calcium daily, or little more than one-fortieth of the normal allowance. The first noticeable effect of the deficient diet was on the growth rate, largely as a result of decreased appetite but also because of decreased efficiency in the utilization of food. The calcium-deficient animals showed no other outstanding symptoms for the first seven to ten weeks. Then a decreased sensitivity and reactivity could be noticed. After two months (corresponding to some five years in the life of a man) any or all of the more drastic symptoms made their appearance. These included prostration, paralysis of the hind legs, black faeces, and haemorrhages from the anus and from the toe-nail bed. There was also polyuria. The paralytic foot-drop of one or both hind legs was probably a secondary effect of haemorrhages in the central nervous system. Immediately after the onset of paralysis the animals were extremely sensitive to touch, but within twenty-four hours the surface of the body lost sensitivity. Prostration and paralysis could be induced much earlier by means of mild, short galvanic shocks. It is striking to note that in not a single instance did tetany appear spontaneously as a result of this uncomplicated calcium deficiency, nor could it be provoked by electric or sound stimuli. Yet the serum calcium level of the deficient animals was generally between 4 and 6 mg. per 100 ml., a concentration which is supposed to be responsible for "low calcium" tetany in animals after parathyroidectomy. The findings of Greenberg and his associates certainly support the view that besides calcium deficiency other factors are concerned in the production of tetany. In magnesium deficiency in rats the blood calcium level remains normal, yet the animals are hyperexcitable and any startling noise throws them into tetanic convulsions.[2 3] A large percentage of calcium-deficient animals succumbed shortly after spontaneous or induced paralysis. Haemorrhages, which may occur in nearly every organ of the body, were the conspicuous feature of post-mortem examination, and were seen in the lungs, brain, bladder, gastro-intestinal walls (especially in the duodenum), nail matrix, and peritoneal cavity. Massive haemorrhagic areas were frequently found in the gluteal muscles. In addition to these macroscopic findings, histological examination revealed haemorrhagic areas in the cerebrum, medulla, brain stem, about the choroid plexus of the third ventricle, in the lower right temporal pole of the brain, and, only occasionally, in the spinal cord. Boelter and Greenberg believe that the haemorrhages were due to alterations caused by the deficiency in the blood-vessel walls. Needless to say, the skeleton was very poorly calcified: the skull hardly at all, and paper-thin. Some animals developed unilateral cataracts. With the exception of calcium blood constituents were normal, and it is noteworthy that serum phosphatase was unchanged. (In milder forms of calcium deficiency the bony frame is chiefly affected, but in severe depletion interference with the extraskeletal functions of the element apparently comes to the fore.) A change of diet to normal was followed by immediate resumption of growth and gradual recovery, though in some cases the loss of use of one of the limbs remained permanent and the animal dragged its leg along as in man after hemiplegia. Injection of calcium salts was of no help at all for the reason that it invariably caused death within twenty-four hours. Necropsy showed rupture of the abnormally thin (right ?) ventricle of the heart in a longitudinal line from the base to the apex.

[1] Kleiber, Boelter, and Greenberg, *J. Nutrit.*, 1940, 13, 517; Boelter and Greenberg, Ibid., 1941, 21, 61, 75.
[2] *J. biol. Chem.*, 1932, 98, 519.
[3] Ibid., 1933, 122, 693.

URINARY ANTISEPSIS

Although the new urinary antiseptics have made it possible to control almost every case of urinary infection not due to gross obstruction or accompanied by severe renal damage, there is still some misconception of how these drugs should be used. It is imperative in the first place to identify the micro-organisms responsible. Infection by *Bact. coli* and other closely related organisms will usually respond with equal readiness to treatment with either mandelic acid or sulphanilamide. In *Proteus* infections mandelic acid is useless, because no amount of ammonium chloride will render the urine acid enough for this drug to act: *Proteus* breaks down urea to form ammonia, and if ammonium chloride is pushed in the hope of acidifying the urine the effect on the patient may be serious, while on the urine it is *nil*. This infection fortunately responds well to sulphanilamide, which acts even better in an alkaline than an acid urine. This indication is reversed for infections with *Streptococcus faecalis*, this organism being unaffected by sulphanilamide but amenable to treatment with mandelic acid. In mixed infections it may be necessary to use these two methods consecutively, first eradicating one micro-organism by the appropriate treatment, and then attacking the other. This has been the position since the introduction of sulphanilamide, but it has been both complicated and improved by the advent of sulphathiazole, a careful study of which has now been made by H. F. Helmholz[4] of the Mayo Clinic. This is the latest of a long series of investigations by which Helmholz has given precision and certainty to our knowledge of urinary antiseptic action. The method he has adopted is to obtain urine from patients taking the drug, estimate the drug concentration in it, add a known number of bacteria, and determine by quantitative culture after incubation whether they have multiplied (and if so to what extent) or diminished in numbers. It is perfectly legitimate to deduce from such experiments what will happen in the urinary tract itself. His experiments with sulphathiazole include over 2,000 such observations, using many strains of each species of bacterium and urine adjusted to three different reactions. As usual there is a good deal of strain variation in resis-

[4] *Proc. Mayo Clinic*, 1941, 16, 651

tance, some strains of *Bact. coli*, for example, being killed by quite low concentrations, such as 25 mg. per 100 c.cm., while others require much more. The effect of *p*H on antiseptic action corresponds to that for sulphanilamide: *p*H 7.5 gives the best effect, and higher concentrations of the drug are necessary to achieve it at *p*H 6.5 or 5.5. The order of bacterial susceptibility to sulphathiazole in ascending order is *Ps. pyocyanea, Streptococcus faecalis, Bact. coli, Bact. aerogenes, Proteus,* and *Staphylococcus aureus*. The fact that staphylococcal infection is the most easily controlled of all is perhaps clearer evidence of the alleged effect of sulphathiazole on this organism than has been obtainable in other fields of therapeutics. It certainly represents the greatest advantage of this drug over others as a urinary antiseptic, for staphylococcal infections of the urinary tract do not respond with the same certainty as others either to mandelic acid or to sulphanilamide. Sulphathiazole has thus filled the last important gap, and these three drugs intelligently used should furnish a complete armamentarium. The increasing complexity of efficient treatment and the uses of laboratory control are illustrated by a peculiar feature in the behaviour of *Streptococcus faecalis*. This organism, unlike all others, is more readily killed by sulphathiazole in an acid than in an alkaline urine: the effect is best at *p*H 5.5. Fortunately the concentration of sulphonamide compounds attained in the urine by only moderate dosage is so high that such refinements as the accurate control of *p*H are superfluous except in the most resistant cases.

WHOOPING-COUGH PROPHYLAXIS

This "plague of the nursery and school" attacked 53,065 children in 1940 and 329 died from it. Since Gardner and others awakened British bacteriologists to the importance of the smooth haemolytic virulent Phase I of the bacillus of whooping-cough the chief problem has been to discover and perfect a method of consistently making a sound prophylactic vaccine. Some years ago this *Journal*[1] pleaded that the vaccine producer should be in a position to guarantee antigenic efficiency when he hands over a vaccine to the doctor. With growing interest paediatricians have watched the accumulation of figures showing that highly protective vaccines have at times been made and used. Kendrick and others[2] in Grand Rapids, U.S.A., recorded a 15.1% attack rate among 2,397 carefully watched unvaccinated controls, contrasted with a 2.3% attack rate among 1,815 inoculated children. Sauer[3] in Evanston observed 286 infections among 1,730 unimmunized children, while only 32 occurred among 2,453 of the vaccinated. McCullough[4] kept under observation ninety-seven inoculated children; of these, twenty-three were in intimate contact—for example, by kissing or drinking from the same cup—with children suffering from pertussis. None of the twenty-three developed the disease. Laboratory experiments clearly indicate that the way is open for making and testing a potent vaccine. J. C. Cruickshank,[5] in 1937, by alcohol precipitation and acetone extraction of a tryptic digest of *H. pertussis*, made a fraction that protected 90% of mice against a dose of bacilli which killed twenty-nine or thirty unprotected mice. Lawson[6] sprayed his living culture with a curved needle on top of the larynx of mice and killed 93%, whereas 93% of mice given vaccine made from smooth virulent strains withstood the same dose without harm. Lawson by his carefully controlled work may have rendered as great a service to the producer of pertussis vaccine as Grinnell[7] did to the typhoid vaccine maker when he showed in 1932 that many commercial typhoid vaccines made with unsuitable cultures did not protect mice. Lawson similarly tested samples of five commercial whooping-cough vaccines and found that two gave high protection to mice tested later with virulent culture, while three vaccines were inefficient. One of these was made by destruction of intact cells and one was said to contain detoxified toxin. We may now be confident that children can be protected by a properly made vaccine proved before release to be efficient, preferably by animal test, for Sauer[3] holds that assay by agglutination and complement fixation is insufficient. A number of weekly injections—from four to eight according to different workers—are necessary, and the number of bacilli injected must be large—about 80 to 120 thousand million. Reactions do not appear to be unduly irksome. Hopes have at times been raised that vaccine given early may shorten or modify the attack. Most workers, however, are of opinion that vaccine is useless after the spasmodic cough is well established, and there does not seem to be convincing evidence that any vaccine proved protective by animal test has any effect even in the early stages—nor on general immunological principles is this probable.

[1] *British Medical Journal*, 1934, 2, 1109; 1938, 1, 459.
[2] *Amer. J. Hyg.*, 1939, 29, 133.
[3] *J. Amer. med. Ass.*, 1939, 112, 305.
[4] *Bull. Brit. Columbia Brd. Hlth.*, 1940, 116.
[5] *Lancet*, 1937, 2, 567.
[6] *Amer. J. Hyg.*, 1939, 29, 119.
[7] *Amer. J. Dis. Child.*, 1937, 54, 979.
[8] *J. exp. Med.*, 1932, 56, 907.

HONORARY PHYSICIANS TO THE KING

The following have been appointed Honorary Physicians to the King for a period of three years: Sir Henry Bashford, Chief Medical Officer, General Post Office; Sir Weldon Dalrymple-Champneys, Bt., Deputy Chief Medical Officer, Ministry of Health; Dr. John Moorcroft McCloy, Chief Medical Officer, Ministry of Home Affairs, Northern Ireland; Prof. W. W. C. Topley, F.R.S., Head of the Emergency Public Health Laboratory Service; Dr. R. Veitch Clark, Medical Officer of Health, Manchester; Dr. William George Clark, Medical Officer of Health, Edinburgh; and Dr. James Ferguson, Medical Officer of Health, Surrey County Council.

The Annual Convention of the Canadian Medical Association will be held this year in June at Winnipeg, under the presidency of Dr. Gordon S. Fahrni, lecturer in surgery in the medical faculty of the University of Manitoba and surgeon to the Winnipeg General Hospital. Those who crossed the Atlantic for the combined Annual Meeting of the B.M.A. and the C.M.A. at Winnipeg in 1930 have happy recollections of Dr. Fahrni, and know him as a keen supporter of the ties between us and the Canadian profession.

This year's Annual Session of the American Medical Association will be held at Cleveland, Ohio, from June 2 to June 6. The A.M.A.'s centenary occurs in 1947.

The President of the Board of Education has appointed Dr. J. E. A. Underwood to be Senior Medical Officer to the Board in succession to Dr. J. A. Glover, who reaches the age of retirement on April 10.

LONDON UNDER AIR BOMBARDMENT: SOME MEDICAL ASPECTS

BY

V. ZACHARY COPE, M.D., M.S., F.R.C.S.

[In the introduction to a lecture delivered to the North of gland Branch of the B.M.A. on March 6 Mr. Cope described : aerial bombardment of London, which started last Septem- r, and mentioned first of all some of its indirect effects upon : health of the community. The factors concerned were the iurbance of routine, shortened sleeping-time, poor ventila- n at some of the places in which refuge was sought, and erference with essential services, especially water supplies ing to broken mains. Incidentally he expressed surprise at greater use was not made of rain-water collected in tubs tanks from roofs, which would, of course, be less easily erfered with by enemy action. He also pointed out how nspicuously the enemy had failed in one of his evident jectives—that of interrupting transport services. One iking proof of this was that although some inconvenience is caused by road diversions and occasionally by a tem- irary and local dislocation on the railway, yet every morning iring the bombardment the milk supply came punctually to e door of every citizen.]

Effect of Shelter Life upon Health

he health of many Londoners during the period of severe id prolonged attack from the air was affected by their ay for many hours at a time in protective shelters. It id been anticipated that shelters would be necessary, and iany, though not enough, had been provided, but it was ot foreseen that the continuous nature of the nocturnal ttack would necessitate the provision of sleeping accom- iodation. In these places, for some weeks before bunks ould be provided, people slept on improvised beds and in eck-chairs. One surprising complication was the onset i a number of cases of thrombosis of the deep veins of the g and consequent oedema of the ankle and foot, due to ie fact that a person reclining in such a chair is apt to ave his legs press unduly upon the lower transverse bar. 'he thrombosis is brought about by the continuous ressure with relaxed muscles. Dr. Keith Simpson (1940) as pointed out a more serious sequel in the form of pul- nonary embolism. The number of cases of sudden death lue to this cause reported in the various London districts n September and October, 1940, was 24, as compared with nly 4 in the corresponding months of the previous year. These cases of pulmonary embolism have disappeared ince bunks were provided, and it is reasonable to conclude hat there was a direct association between the two facts. t is possible that a further consideration of the mechanism of the production of thrombosis in such cases may furnish aluable information concerning the occurrence of post- operative thrombosis and embolism.

Another surgical complication directly attributable to he prolonged stay in shelters was the great increase in cases of retention of urine in old men. Cold and damp may have been contributory, but the main factor must have been the limited conveniences at first provided: opportunity could not be found to pass urine until the bladder was over-distended, and thereafter retention en- sued. Such cases will no doubt occur less frequently now that the shelters are better equipped.

A method of prophylaxis which, we are informed, may be introduced into the shelters can be properly commented upon by a surgeon—namely, the provision that has been made for the wearing of masks to prevent the spread of droplet infection. We are told that half a million masks are ready to be distributed as and when required. Surgeons have long acted upon the view that infection can easily be transferred by means of the breath, and the wearing of masks is a routine in the operating theatre. The human nasal and pharyngeal mucosa is in some cases as susceptible to infection as an open wound, and I have often been surprised that physicians have not strongly preached, and by force of example demonstrated, that contagion of the common influenzal cold could be pre- vented by the wearing of an efficient mask. If in the shelter, why not in the work-room or office? Making the reasonable assumption that in Great Britain every year one million people lose one day from work as the result of a cold, the time lost from this cause annually would equal nearly 3,000 work-years. Would it not be worth attempting to reduce this time by mask prophylaxis?

The direct mental effects of the bombardment con- founded the prophets. The predicted panic and mass hysteria did not occur, the plain fact of the matter being that the average British citizen, whether soldier or civilian, is brave and resolute, and when faced with danger pre- serves an equanimity and stability of mind which is in large measure responsible for the greatness of the nation.

The Casualty Lists

Another surprise was the relatively small number of casualties following upon bombardment. Pre-war esti- mates had mentioned anything from 30,000 to 150,000 as likely to follow one big raid. When the attacks were made they were certainly on a large scale, for on several occasions it was said that 300 or 400 bombers dropped their explosive loads upon the metropolis in one night; yet the number of casualties, while most regrettable, was on a much smaller scale than the most optimistic of prophets had ventured to forecast. The number for the country as a whole has been published, and we were told on one occasion that the casualties for London then com- prised about four-fifths of the total. Since then the pro- portion has been less great because several provincial cities have had severe attacks. From the figures officially announced a rough estimate can be made that during the 100 days of intensive attack there was a daily average in London of more than 100 killed and more than 150 injured.

This comparatively small casualty list was not due to the fact that the people were all in shelters, for the majority still elected to sleep in their own houses, preferring, as one woman said, "to die suddenly in our own home rather than die a lingering death from 'shelter pneumonia.'" The striking feature of the casualty list, however, is the high proportion of fatal injuries. It was fairly constantly found that about 40% of those sufficiently hurt to be termed casualties had been fatally injured—a proportion much higher than in ordinary battle, and requiring some explanation. The explanation is to be found in the age and condition of the victims, the nature of the injuries, and the number of factors which may operate in one case. A battle is fought by young men in good physical health, but civilian air-raid casualties include the old and infirm, and the very young and sensitive. In battle a single bullet or part of a shell may cause considerable injury without hitting a vital part, while in air raids one vital part at least is likely to be damaged by the common crush injury. Again, when people are caught in the wreckage of a house many secondary missiles are formed by fragments of the building. In addition there are the dangers of asphyxia from burial in debris or from inhaling clouds of dust, the peril of poisoning from escaping gas, the risk of fatal burning in the ensuing fire or scalding by steam from broken pipes, and there is the effect of severe shock induced by the pressure of heavy and not easily removable structures pinning down the victim.

Wounds due to Glass: Crush Injuries

I cannot here describe fully the various types of wound and the complications that may be encountered. I can only emphasize some points in respect of which the injuries due to bombardment differ in kind or degree from those customarily met with in civil or in military surgery. These differences depend for the most part on the large proportion of crush injuries which result from falling buildings, on the frequent occurrence of severe effects of blast from high explosive, and on the injuries from secondary missiles, particularly from fragments of glass.

Injury from broken glass can be very serious. The force of an explosion often breaks all the windows in the buildings around the site, and glass fragments of all sizes

are propelled in every direction at great velocity. Glass easily enters the tissues, but is not as a rule infective. Large fragments may do serious damage, and may need to be removed promptly, but in some cases innumerable small portions may become embedded, the removal of which is impossible or inadvisable. Some of these cases have developed anaemia a few days later, and have required blood transfusion. Perhaps it may be assumed that there were multiple small haemorrhages caused by some of the deeper fragments. Recognition of glass in the tissues by means of radiographs is fairly easy (see Fig.).



Radiographic illustration of multiple glass fragments in the arm (by courtesy of Dr. J. C. Davidson).

Injuries due to crushing of body or limbs by great masses of debris have constituted some of the severest lesions. This is not a question of a sudden crush which is soon relieved, but, as a rule, of a pressure continuing for minutes or even for hours before release. Fractures of limbs, pelvis, or spine, which ordinarily cause a great amount of shock, will in these circumstances depress the vitality to the limit of endurance or beyond it. One form of spinal fracture which I have not seen in civil work is a horizontal fracture through the bodies of several adjacent vertebrae, with little or no compression and only slight forward displacement of one or other fragment of the fractured bodies. In one or two cases there had been no suspicion of a fractured spine until routine x-ray examination revealed the state of affairs

Shocked Patients

As a rule there is no difficulty in recognizing that a patient is suffering from severe shock, but it is well to remember, what I pointed out as long as twenty years ago, that the classical symptoms of shock are not all present in any individual case. Recently Whitby (1941) and others, in a study of secondary shock as seen in air-raid casualties, have emphasized the same point of dissociation of shock symptoms. They rightly insist that the pulse rate may be dangerously misleading, that the mental state is no index to the severity of shock, and that the amount of sweating may be unrelated to the degree to which shock is present. I agree with Whitby and his colleagues that blood pressure is at present the most reliable measurable factor at our disposal for assessing the severity of shock, but I would add that in some cases the pulse pressure may be a better guide to the patient's condition. It may be that in the future we may obtain a better indication from the measurement of the blood volume or the specific gravity of the peripheral blood. A point not sufficiently recognized is that a degree of shock may exist before the systolic pressure falls, and that sometimes an apparently normal systolic pressure may coexist with a very serious state of shock. The most important lines of treatment for shock are rest, warmth, administration of morphine or omnopon, and the giving of plasma or blood transfusions, before disturbing the patient further by undressing, washing, taking radiographs, and, still more, by operative intervention.

Other Complications of Injuries

A new form of intestinal injury, caused by prolonged pressure on the abdominal cavity, has been discovered. In the case of a woman who lay helpless with a heavy beam pressing upon the lower part of the abdomen, subsequent exploration showed a state of peritonitis due to multiple points of gangrene in a coil of small gut lying in front of the lower lumbar vertebral bodies. Resection was carried out, but did not long delay a fatal issue. As there was no obvious lesion of the abdominal wall and no thrombosis of the mesenteric vessels, it is reasonable to conclude that the multiple points of gangrene resulted from the continuous direct pressure on the wall of the coil of gut. McMichael (in a personal communication) and others have recently described a very serious complication of severe crushes of the limbs in the shape of symptoms of profound shock accompanied by signs and symptoms of renal failure. Urinary output diminishes, vomiting and abdominal distension supervene, and the blood urea rises to a high level. In cases which came to necropsy extensive aseptic necrosis of the crushed limbs was found and the kidneys showed some tubular degeneration and blood casts in the collecting tubules.

The effect of blast is an important factor in air-raid casualties. The experiments of Zuckerman (1941) suggest that much of this effect may be due to the impact of the sudden pressure upon the exterior of the trunk, causing injury to the contained viscera. Surgically, the effect of blast on the abdominal cavity is of importance. Zuckerman, in experimental cases, has observed haemorrhage into the gut wall and even rupture of the bowel. Some confirmation of the experimental findings is given in the account by O'Reilly (1941) of five air-raid casualties which presented symptoms of acute abdominal disorder, and in which at operation some subserous haemorrhages were found but no major lesion. Mitchiner (1941) mentions a case in which he attributes rupture of liver and spleen to the effect of blast.

Clearance of Casualties

[In the last part of his lecture Mr. Zachary Cope recalled the inauguration of the Emergency Medical Service, the arrangements which were set up for distribution of casualties to hospitals, the division of London and the surrounding area into sectors, and the enlargement and equipment of outlying hospitals.]

The immediate medical treatment of casualties fell to the lot of the mobile units and first-aid posts. Doctors attached to mobile units were quickly on the scene of "incidents," and the work done by them in conjunction with first-aid squads has been in the highest degree praiseworthy. First-aid posts dealt with casualties as they were brought in, and the more serious cases were sent on to the nearest hospital. The view held by Trueta that first-aid posts should generally be in or attached to a hospital, where any necessary treatment can be performed, seems to have some support from London experience.

The effect of bombardment, with evacuation and blackout, was to diminish considerably the work of the general civilian practitioner. Patients did not throng the surgeries as in peacetime. Fewer beds were available in the central hospitals and many hospitals were hit by bombs, but a good out-patient service has been maintained. As for medical education, the pre-clinical students for the most part are out of London. Students doing hospital work have been distributed among the hospitals in the sector to which their medical school is attached. In some cases this has led to a closer relation between student and teacher, which is all to the student's good, but in certain instances regular teaching has not been easy to maintain.

In this rapid survey I have skimmed the surface of the subject; in due time many will write more fully of each

of its aspects. It is to the credit of the medical profession that its members, sharing ordinary civilian risks, stood to their posts of duty, which often involved great additional risks, with unflinching courage and resolution.

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For crush uraemia see also Bywaters, E. G. L., and others (1941) *British Medical Journal*, 1, 427, 432

PSYCHOLOGICAL TERMS USED IN CASES OF HEAD INJURY

A glossary of psychological terms commonly used in cases of head injury has been drawn up by the Brain Injuries Committee of the Medical Research Council (chairman, Prof. E. D. Adrian) and is published by H.M.-Stationery Office as M.R.C. War Memorandum No. 4 (price 1d.). The object in view is to secure greater uniformity in case notes on such patients. Hitherto there has been no generally accepted definition of the words commonly used to describe the clinical effects of trauma upon the brain. The committee's notation, set out below, is already employed at the special centres for treatment of head injuries, and it is hoped that publication in this form may facilitate its adoption as a standard terminology throughout the medical services. The terms defined refer to the commoner psychological disturbances after head injury, but the list is by no means complete. The definitions are intended also to be useful for abbreviating description and for facilitating exchange of information between different observers. They are arbitrary and may not readily find universal acceptance; but since many of the words have in the past been used in varying senses, it seems essential, to avoid further ambiguity, that fixed definitions should be accepted and used. The prefix "traumatic" as used in this glossary denotes that the symptoms are due to the physical effects of head injury on central function; it may be added as a qualification to the appropriate term wherever applicable (for example, in "traumatic semicoma"), but its use should be obligatory for the terms to which it is attached in the list.

Glossary

COMA: A state of absolute unconsciousness, as judged by the absence of any psychologically understandable response (including, for example, change of expression) to external stimuli or inner need.

Note.—If a patient is comatose it is important to record the state of activity at levels of nervous integration lower than that which is the substratum of consciousness. Such activities are reflex—e.g., swallowing, pupillary and corneal reflexes, tendon jerks, plantar responses. It is not uncommon to hear it said of a patient who is comatose and cannot swallow that he is "deeply unconscious." This statement has no real value. He should be said to be comatose with loss of swallowing reflex.

SEMICOMA: A state in which psychologically understandable responses are elicited only by painful or other disagreeable stimuli—e.g., pinching the skin, shaking the patient vigorously.

CONFUSION (Clouding of Consciousness): Disturbance of consciousness, characterized by impaired capacity to think clearly and with customary rapidity, and to perceive, respond to, and remember current stimuli; there is also disorientation.

Note.—When a patient is said to be suffering from confusion the degree (see below) should always be specified.

Degrees of Confusion

Mild.—A state in which the patient, though presenting the characteristic features of confusion in some degree, is capable of coherent conversation and appropriate behaviour.

Moderate.—A state in which the patient, though out of touch with his surroundings, can be got to give relevant answers to simple questions such as "What work do you do?" "How old are you?" "Where do you live?"

Severe.—A state in which the patient, though for the most part inaccessible, will occasionally show adequate response to simple commands forcibly given and, if necessary, reinforced by appropriate gestures—e.g., "Put out your tongue," "Take my hand."

DELIRIUM: A state of much-disturbed consciousness (confusion) with motor restlessness, transient hallucinations, disorientation, and perhaps delusions.

TRAUMATIC STUPOR: A state in which the patient, though not unconscious, exhibits little or no spontaneous activity. In traumatic stupor there is always confusion.

TRAUMATIC AUTOMATISM: A state in which the patient, though capable of responding normally to his immediate environment, subsequently has amnesia for the period in question. In this state there is always some degree of confusion with disorientation.

CONCUSSION: A state of unconsciousness, or impaired consciousness, however fleeting, suddenly produced by mechanical force applied to the skull, and usually followed by retrograde amnesia.

TRAUMATIC DEMENTIA: Progressive mental impairment, predominantly of the intellectual functions, resulting from structural damage to the brain.

TRAUMATIC INTELLECTUAL IMPAIRMENT: Impairment of the intellectual functions which may be persistent or recoverable, but is not progressive, resulting from structural damage to the brain.

TRAUMATIC PERSONALITY DISORDER: Alteration of temperament and character which may be persistent or recoverable, but is not progressive, resulting from structural damage to the brain.

MALINGERING: Intentional simulation of symptoms.

HYSTERIA: A condition in which mental and physical symptoms not of organic origin are produced and maintained by motives never fully conscious, directed at some real or fancied gain to be derived from such symptoms.

Note.—The adjective "hysterical" may be applied either to this condition or to the type of psychopathic personality common among those who develop this condition, but it should not be applied—as is often done—to behaviour which is merely uncontrolled and emotional.

INSIGHT: Capacity for arriving at as objective and correct an estimate of any impairment due to one's illness as would be arrived at by a detached onlooker with equal access to relevant facts.

JUDGMENT: Capacity for arriving at reasonable conclusions, leading to well-adapted behaviour, especially as indicated by conduct in the practical affairs of daily life.

COMPREHENSION: Capacity to integrate diverse percepts and or ideas and to understand the relation between them and one's personal experience.

AMNESIA: Impairment of memory, however caused. It is most commonly applied to incapacity to recall particular topics or the happenings of a particular period.

EPSOM COLLEGE ANNOUNCEMENTS

We publish the following announcements regarding vacant scholarships for girls and a pension for a doctor, at the request of the Royal Medical Foundation of Epsom College.

Scholarships for Orphan Daughters.—The Council of Epsom College will shortly proceed to award St. Anne's Scholarships to girls attending Church of England schools. Candidates must be fully 9 and under 16 years of age, and must be orphan daughters of medical men who have been in independent practice in England or Wales for not less than five years. The value of each scholarship is dependent upon the means of the applicant and the locality and fees of the school selected.

Pension for a Necessitous Medical Man.—The Conjoint Committee of Epsom College will in May next award a "Christie" pension of £89 per annum to a necessitous medical man, fully 55 years of age. Candidates must be duly qualified, and have been registered for five years.

Forms of application can be obtained from the Secretary, Epsom College, Surrey, and must be completed and returned by April 25, 1941, at the latest.

MEASURES FOR CONTROL OF LICE

In a leading article in the *Journal* of February 8 (p. 199) on lice and disease we referred to an investigation undertaken by Mr. Kenneth Mellanby at the request of the Minister of Health and the President of the Board of Education into the incidence in England of vermin infestation, particularly by head lice. The two Departments have now issued a joint memorandum to local authorities and their medical officers of health, which, after summarizing the scope and findings of the investigation, indicates the action which the authorities should take, and reminds them of the powers they have, to secure a reduction in the incidence of verminous conditions.

Findings of a Survey

Mr. Mellanby's survey, the memorandum states, was based on some 60,000 cases in hospitals—mainly infectious diseases hospitals—in industrial cities having a population of about 400,000, in rural counties, and in two Midland counties, one of which has a mixed rural and industrial population. It showed that: (1) a very high degree of infestation with head lice exists in the industrial cities, but that body infestation is rare; (2) girls are more frequently infested than boys; (3) the highest incidence is found in pre-school children; (4) the percentage of children infested is very low in rural counties; (5) in industrial cities infestation in girls reaches a peak at 3 years (51.6%) and remains round about that level until the age of 14, while in boys it declines steadily with age after the peak is reached in the fourth year; and (6) the percentages in the industrial cities on the average are three times those shown in the reports of school medical officers. These findings once more indicate, the memorandum continues, that it is to districts in which housing and social conditions are unsatisfactory that the main weight of any campaign to eradicate verminous conditions must be directed.

Education the Key

Mr. Mellanby concluded that education of the public was the only method likely to give permanent success, and the memorandum indicates the lines on which this should be undertaken. First, children once cleansed should not run the risk of reinfestation at home, and the public generally, but especially mothers, should be taught the importance of clean heads, not only to the health and comfort of the child, but to their own social credit. School children, particularly the girls, who will be the future mothers, should be taught the same thing, school teachers if necessary getting the help and advice of school nurses or similar persons. There should be a more thorough examination of heads in schools, and if school nurses cannot devote further time to this part of their work local authorities should consider whether it could be done by less highly trained persons under the supervision of the nurses. Advice should be given in articles and talks on health, and all persons known to be verminous should be told how they can rid themselves of the trouble and avoid it in future. Frankness and discretion are needed, because it is known that progress has often been hampered by attempts to conceal or deny the existence of a condition which may be regarded as detrimental to the individual.

Education authorities, the memorandum continues, already have the power to direct the medical officer of health or person authorized by him to examine any child at any elementary school and require the parent to cleanse him (in accordance with written instructions) within twenty-four hours, or, if the parent fails to do this, to remove the child for cleansing. Local authorities have power to provide cleansing stations, to cleanse persons applying to them and their clothes, and, in London, compulsorily to examine inmates of common lodging houses and order cleansing. The memorandum concludes by saying, however, that improvement will be secured not by resorting to compulsion, but by using to the full the administrative measures available for dealing with cases that arise, and preventing recurrence by intensive education of the public.

DISTRIBUTION OF AIR-RAID CASUALTIES

This article on the distribution of casualties to hospital is written by a surgeon who has recently visited heavily bombed cities.

For the person injured in an air raid the ideal medical service would be one which was conducted under one control from the moment the patient received his injury to the time of his return home completely convalescent. If such an arrangement were in force, it would not be difficult to decide the "saturation point" for any given hospital, the organization of ambulance services, the instructions to be given to drivers, and the delivery of casualties to the best advantage to all concerned. The present state of affairs arose because one part of the A.R.P. services is under the control of one Ministry and another part under another. The fire brigades and the police are, of course, the direct responsibility of the Home Office, and it was perhaps natural that the warden service, because of its semi-police functions, should come under the same authority, which also recruits and for the most part trains the rescue squads and stretcher-bearers. Decontamination squads are employed by local authorities. Local or scheme-making authorities—as, for example, the L.C.C.—were already before the war responsible for the ambulance services. The Ministry of Health controls first-aid posts and, indirectly, ambulances. Its contact with the first-aid parties is through the medical officers of health, who, while under scheme-making and local authorities, look to the Ministry for guidance.

Now experience has shown that rapid admission of casualties to hospital depends upon the co-ordinated effort of the entire A.R.P. service: a quick report by the warden; action by the police to clear the way for all services; priority for the fire brigade and the rescue squads; competent direction of first-aid parties by the incident doctor; skilful deployment of ambulances under the direction of the incident officer, and clear instructions to the drivers. This chain must be perfect in every link.

No one person at a single incident can have a complete picture of both this and the other events that may be happening simultaneously. Sometimes confusion may be so great that even Central Control may not be able to obtain a clear picture of the situation, but it alone can determine the best distribution of available resources, decide when to call for further assistance, and assume the ultimate responsibility for diverting ambulances from a hospital which is approaching saturation point.

Operating Capacity of a Hospital

With these facts in mind, and in the light of actual experience, it is now possible to consider the hospital problem itself. Originally the number of vacant beds was considered to be the measure of the capacity of a hospital, a conception that for some time dominated the organization of the ambulance service. Long before the beginning of severe air raids, however, surgeons pointed out that no more stretcher cases ought to be admitted to a hospital at one time than can be deliberately operated upon within six, eight, or, at the very most, ten hours, and the conception of what a hospital's capacity is was modified. Within the first eight hours bacteria in a wound remain, broadly speaking, "on" rather than "in" the living tissues, and are thus susceptible of removal by the customary surgical toilet.

How many cases can be dealt with on one table within ten hours or, preferably, within eight or six? It is safe

to say that in the last war, apart from the treatment of "walking" cases, the average table, continuously manned, did not operate on more than twenty-four cases in twenty-four hours. No doubt this number was exceeded on occasion, but it may be safely taken as the limit for the average theatre capacity. Thus a four-theatre hospital should not admit more than forty or fifty cases at a time (not all will need operation, so a margin may be allowed), and a two-theatre hospital twenty-five. When this capacity has been reached the hospital should "switch"—using the arrangements already existing and now to be codified—to ensure that further casualties are diverted to other hospitals.

Switching

The present mechanism for switching is complicated, and differs in different localities. The following methods have been employed. A hospital, when full, has simply shut its gates, stationing someone to advise arriving ambulances to go to the next hospital on the list and to report back to the Incident Officer. This method is open to serious misunderstanding and has led to bitter recriminations. Moreover, not all ambulance drivers have lists of hospitals to be used in succession as necessity arises. The Medical Superintendent or Medical Officer in charge of a hospital has made his contact in various ways. He has communicated by telephone with his Hospital Officer (in Region) or Group Officer (in Sectors). He has sent word to the nearest Report Centre, Sub-Control, Control, or to an ambulance group superintendent, or even direct to an ambulance depot. Messages have been sent to police, and even to fire-brigade, stations when it is known that they are close to a depot that cannot be reached direct. Hospitals have approached other near-by hospitals direct, and warned them that cases are being diverted to them. Unfortunately, telephones often break down, and though in some places the private police lines may be available when the general system fails, it is often absolutely necessary to use messengers. Messenger services have frequently proved quite inadequate. Whatever the system ultimately adopted, every hospital should know the procedure current in its own area, and meanwhile every method for utilizing the utmost capacity of its own resources should be known and practised.

Relief Surgical Teams

For instance, if all the available tables cannot be manned from the available staff, the assistance of visiting teams should be sought. These "supplementary" teams will have at their disposal all the routine facilities of the hospital—for selection of cases and their transport to and from the theatre, supplies of sterilized dressings, clothes, instruments, solutions, anaesthetics, etc. Alternatively it may happen that there are too many patients for the number of tables and that transfer is impossible. Then the visiting team may properly be summoned to "relieve" the original teams, who may tire before the work is completed. Or relief may be necessary when one raid rapidly follows on another and the regular theatre team has practically no rest between the two.

It is no use summoning relief teams unless the accessory services are in a condition to function. It is not only the surgeons, their assistants, and the theatre nursing staff who tire. All the active members of the hospital organization—the ward staff, the dispensers, the laboratory staff, the x-ray technicians, the linen-room attendants, the kitchen staff, the sterilizers, bearers, porters, clerks—all may have been overworked and require to be relieved. It has happened that visiting teams have arrived to find a whole staff exhausted, falling asleep, or actually asleep. Most hospitals have grown accustomed to sending requests for blood and plasma, but some of them still consider it a reflection on their efficiency if they make similar requests for sterilized dressings, surgeons' aprons, A.T.S., or sera and other supplies. All these can be made available in an emergency.

Preparations for Relief

It is important that the medical officer in charge of every hospital should, in times of stress, anticipate the moment when his organization will need rest, and that he should summon help well in advance of that moment. Matrons, too, should be ready to ask for relief nurses from a central pool or from another hospital. The medical officer should make sure that when surgical help arrives there will be enough still fresh members of his own resident staff for the rather delicate task of making the visitors at home with the routine of the hospital, and for giving all the help (and a little more) that they are accustomed to give their own surgeons and physicians. Visiting teams, which often arrive after difficult and sometimes dangerous journeys, have at times had cause to complain of their reception. It is true that they may not always have visualized the trials to which the visited hospital has been subjected; but more often than not they are of course fully aware what these are. Nevertheless, a visiting team has a right to expect to find a ready-made plan for its reception. Surgeons, housemen, and sisters will need to receive immediate instructions and information from their corresponding colleagues at the hospital. A member of the senior staff, perhaps a physician, should give the visiting surgeons full information about the patients who are waiting to be treated.

When continuous or severe raids lead to some inevitable disorganization, the more self-contained a visiting team is the better. In addition to anaesthetist, assistant, and sister, it is of great advantage if the team also includes students and/or auxiliary nurses, who can act as orderlies to fetch, carry, make inquiries, take notes, etc.: if it also arrives with its own instruments and sterilized supplies, so much the better. Before the operating theatre is available the relief team may be needed to help by examining admissions, selecting cases for priority, preparing them for operation, carrying out blood transfusions, undertaking immediate post-operative management of patients just off the table, and generally performing duties which normally are left to juniors. If two relief teams arrive simultaneously, one may offer the help just described whilst the other operates, with interchange of duties at a later period.

Further Points

The task of the visiting team is greatly simplified if the receiving hospital has set aside a reception ward adequately cleared for resuscitation. This should be possible in all but the smallest hospitals, and the value of such a ward has been so fully proved that the normal prescriptive rights of a surgeon over his own ward should not be allowed to stand in the way of securing a reception ward at all costs. Whether the hospital has one man always in supreme charge or not, the reception ward should be in the charge of a senior surgeon experienced, if possible, in war work at a C.C.S. If the work of the reception ward goes smoothly, then half the battle is won.

Clear plans, giving exact details, with names, dates, and hours, should be posted in every casualty receiving hospital in the country. During a raid the surgeon in charge of the team on duty should have complete charge of the hospital and be able to make use of any wards, whether they are under his care or not. The second team, with its surgeon, should be on call, while the third team, if not

required, should be available to send to the assistance of another hospital needing it. Visiting physicians and specialists and additional surgeons should all find some place in the composition of the teams.

The whole A.R.P. system is founded on the idea of mutual support. In general it has worked extremely well, but, as was to be expected, experience has revealed loopholes in the organization of various departments. As has already been stressed, the principal fault is failure to make preparations in advance down to the smallest detail, and this applies to the reception not only of relief surgical teams but of police, firemen, rescue and stretcher parties, ambulances, mobile units, and so forth, which have to be met, distributed, housed, or sheltered. Failure in preparation often means that the heads of the various services have, during their urgent duties in a raid, to be called away to improvise arrangements that should have already been made.

Hospitals that have adopted the principles outlined above and have perfected their plans have successfully undertaken arduous work under the most adverse conditions. When such hospitals put in a call to be switched, then their request will be accepted without question; when the hospital is once again ready to receive casualties it must inform Control of this fact. Here it might be added that no hospital should be reluctant to send out a relief team on the grounds that in their absence it might itself be damaged in a raid, as it is obvious that it will have its one or more basic teams in reserve.

The lesson of all this is that the work must be done at the spot where it is needed, no matter who does it.

AIR-RAID PRECAUTIONS

The February issue of the bulletin *A.R.P. Progress*, published by the National A.R.P. Co-ordinating Committee, 30, Bedford Row, London, W.C.1, summarizes recent progress in our preparedness against air attack and gives some useful information about gas—information which should certainly be more generally known.

Precautions against Gas Attack

The following are the main types of gas attack which may be expected: (1) Non-persistent gas or smoke released from planes either by bombs or by generators. (2) Persistent gas sprayed or scattered from low-flying planes, or dropped in containers. (3) Clouds of gas or smoke released from ships (this would be possible over the South-East and as far as London). (4) Gas from shells, tanks, or grenades if troops are landed.

Because the enemy is nearer, and especially because people have become careless about gas masks, such methods of attack are at present more likely to be successful than at the beginning of the war. They might be used to cause disorganization, since a heavy attack of mustard gas would compel wholesale evacuation from the areas affected, these areas remaining unsafe until they had been decontaminated either naturally or artificially. Alternatively gas might be used simply as a means of destruction and to bring about panic. As surprise would be an important factor, such an attack would be made in the first place on a large scale. The public cannot be too strongly urged to carry their masks with them wherever they go, especially at night, when a large-scale attack would be most probable. In the House of Commons on March 27 Mr. Herbert Morrison said: "The Government are taking fresh steps to ensure that every member of the population carries, practises with, and is in every respect familiar with the use of his gas mask. The authorities responsible for the periodic inspection of gas masks should be punctilious in their duties. Although in some areas inspection is frequent and efficient, there are some vulnerable parts of the country where it is not carried out at all.

The *Bulletin* advocates proofing all shelters and Tube stations. It is pointed out that large, well-designed shelters can be easily gas-proofed, whereas small ones are on the whole more difficult.

It is recommended that the following facts should be impressed upon shelter marshals and on the public: (1) that an ordinary room with windows shut and chimney packed gives considerable protection; (2) that the danger of suffocation in shelters from vitiation of air by breathing is negligible, since overheating of the air and panting would give ample warning; (3) that there is extreme danger of bringing liquid mustard gas or gas-generating substances into shelters or houses on boots and shoes; (4) that the civilian gas masks can be relied on.

Table Shelters

The National A.R.P. Co-ordinating Committee is unfavourably disposed towards the new indoor "table" shelters. The Government itself has said[1] that indoor sectional steel shelters would take up space increasingly needed by the bombed and homeless; that they "provide no additional protection against splinters beyond that which the walls of the room provide"; that they might well be driven through the floor or displaced by the weight of the collapsing house, or the exit from them might be blocked by falling masonry and those within might find themselves trapped and threatened by fire or escaping gas. The Co-ordinating Committee points out that these objections apply equally to the table shelters. Protection in them is below "code standard," since house walls are commonly of 9-inch brickwork, while the standard wall for a surface shelter is 17½ inches. Moreover, it is impossible to gas-proof these shelters. Most important of all, they use up steel which is badly needed for other purposes, particularly for the construction of heavy shelters.

The committee's criticism is not destructive only. It believes that an indoor shelter could serve a useful purpose in scattered areas where the communal shelter may be far from home. Home Security Bulletin C.14 describes a good indoor shelter with a cross-braced framework independent of the structure of the building, supporting a canopy which would catch falling debris. It is recommended that in any case windows and doors should be provided with baffle walls as a protection against splinters, that there should be an emergency exit, and that the room chosen should face soft ground to avoid damage from concrete which an explosion might throw up in splinters. A room prepared in this way could be used for other purposes.

While the new fire-fighting arrangements are justly praised, two dangers are emphasized—that of reduced output owing to the extra hours and strain, and the difficulty of protecting fire-watchers while they are on duty. Some kind of protection even against shrapnel and splinters would be a help.

The problem of fire-fighting, like the earlier one of utilizing the Tubes as shelters, has been met by sheer force of circumstances. But in less obvious matters—urgent though they may be—officialdom is still adopting, the *Bulletin* states, a blundering, half-hearted policy. The Board of Education states: "Damage to schools has been almost wholely confined to the hours of darkness when children are not at school, and this is a factor which is clearly relevant to the consideration of the type of protection to be provided." Building of shelters is still talked of as in some instances "impracticable," to be supplemented by the admittedly makeshift method of scattering school children to neighbouring houses during an alert. The Co-ordinating Committee, on the other hand, has prepared drawings of a modified "Haldane" shelter—class-rooms by day, safe shelters by night. Drawings can be obtained from the committee at 1s. 6d. each post free.

[1] *Air Raid Shelter Policy*. H.M.S.O., Cmd 5932. (2d.)

Local News

ENGLAND AND WALES

Country Branches of London Hospitals

St. Thomas's Hospital and Guy's Hospital are both opening country branches within the next few weeks, the former near Godalming and the latter near Sevenoaks. The country hospital of St. Thomas's will have 350 beds, about 100 beds being retained in London to meet emergencies; the out-patient department and various clinics will also be on the old site. The medical school will in the main follow the hospital into the country, the students being accommodated a few miles away in an old manor house. The hospital itself is built on the hutment plan, and nurses and other personnel will also, as a wartime measure, be lodged in huts. It is intended to have a special ward in which children suffering from air-raid injuries may be treated. The magnificent block of St. Thomas's, south of Westminster Bridge, which was opened by Queen Victoria exactly seventy years ago, suffered severely in the early air raids, and the damage to buildings and equipment has been estimated at over £1,000,000. Guy's has not actually suffered severe damage to the fabric, but surrounding property has been destroyed and the hospital income from property rents has dropped by about £12,000 a year as a result. A gift of $10,000 has been made by the American people for the equipment of the country branch, and it is hoped to commemorate this gesture in the name given to the hospital. The hospital in London will be maintained with 180 beds for civilian sick, apart from 200 reserved for air-raid casualties, and full out-patient facilities. If the hospital services should be seriously handicapped by further severe bombing in the neighbourhood an immediate switch-over will be made to the country branch. Both hospitals emphasize that this is not necessarily a wartime measure, but may be the beginning of a development of the large central voluntary hospitals to be continued after peace returns.

SCOTLAND

Polish School of Medicine in Edinburgh

A Polish School of Medicine was inaugurated at Edinburgh University on March 22, Sir Thomas Holland, Vice-Chancellor of the University, presiding. The school is being provided for the Polish Government by the Senatus of the University, and the first beneficiaries will be men who completed their studies in Poland but who, because of the war, did not sit for their final examination. The academic ceremony was attended by the President of the Polish Republic (M. Raczkiewicz), upon whom was later conferred the honorary degree of Doctor of Laws. Sir Thomas Holland referred to the occasion as unprecedented in the history of universities. Although wars and invasions had occurred in every century, he said, never before since the rise of universities five or six hundred years ago had these seats of learning in any country been ruthlessly destroyed as had happened during the present war in Poland. With the revival of learning in the Middle Ages the universities were founded as *studia generalia*, institutions to which scholars were welcome from all countries. Among the first to be founded was the University of Cracow [actually the oldest university in Central Europe, established in 1364], which had now been destroyed, but which would rise again as a nursery of truth for all peoples. He referred to the great names associated with the university, including, among the scientists, Copernicus and Marie Curie. Now in Edinburgh, around the nucleus of fewer than a dozen professors and forty-six students, there would grow up a Polish School of Medicine which, when it returned to its own land, would inaugurate a new era as the foundation faculty of the rejuvenated universities of Poland. President Raczkiewicz expressed his gratitude, and Prof. Sydney Smith, Dean of the Faculty of Medicine in Edinburgh, welcomed the fellow members of a great profession imbued with common ideals of service for humanity and a common quest for truth, to which a suitable reply was made by Prof. Jurasz, Dean of the Polish Faculty of Medicine. Later in the day a civic reception was given by the Lord Provost, when again the Polish President spoke. This new departure at Edinburgh has been the subject of negotiations for some time past. There are a number of Polish medical professors and lecturers in Scotland, some of whom were already professionally engaged in the laboratories of the University, and some Polish students, both men and women, have been attending classes.

Glasgow Municipal Hospitals

The Glasgow Corporation has unanimously approved a scheme proposed by the medical officer of health for the city whereby the municipal hospital facilities would be reorganized. The scheme provides for a change in the control of admission to hospital by granting the public health department powers to use these institutions for general treatment instead of confining their facilities to Poor Law patients. This important reorganization will complete the process of transferring all the municipal general hospitals in the City of Glasgow from Poor Law to public health control. Fifteen hospitals, large and small, are affected by the administrative change, which will take effect when the scheme has received approval from the Department of Health for Scotland.

Reports of Societies

DYSPEPSIA IN THE FORCES

At a meeting of the Section of Medicine of the Royal Society of Medicine on March 25, with Sir MAURICE CASSIDY in the chair, a discussion took place on dyspepsia in the Forces.

Colonel H. LETHEBY TIDY divided the subject under three headings: (1) peptic ulcer; (2) functional dyspepsia; (3) transient dyspepsia. Was the amount of dyspepsia in the Army larger than in civilian life? Payne and Newman investigating Army cases in the early part of the present war found that 92% of those affected had had symptoms before joining the Service; a more recent examination of the records of a hospital by Graham showed that of the patients with peptic ulcer 94% had shown symptoms in previous civil life. Only a trifling number of cases of peptic ulcer had developed in the Army. He drew attention to the great increase in dyspeptic conditions in the population generally during the last twenty years; he thought the profession had been somewhat remiss in not recognizing this increase. At the same time, relapses seemed to take place more quickly under Army conditions, owing partly to Army food and cooking. Army diet was more liberal and heavier than that to which the mass of the civil population was accustomed, and was undoubtedly a satisfactory diet to healthy men not previously subject to dyspeptic disturbances. As for cooking, there were deficiencies in the early months of the war, but it had been improved out of all knowledge, and still this rapid relapse of cases with organic dyspepsia occurred. He was convinced that these men would have relapsed just as surely whatever the diet and whatever the cooking. A menu chosen by Lucullus and a meal cooked by the chef of the Ritz would not have prevented relapse. Army routine was not compatible with the maintenance of continuous health in men who were subjects of chronic dyspepsia. It must be remembered that a relapse in the Army meant one thing and in civil life another. A man in civil life who felt any recurrence of his old trouble laid up at home for a day or two on a milk diet, but the man in the Army had to go into hospital and thus became officially a case of relapse.

Psychological Factors

Colonel Tidy next went on to speak of the psychological factor. The conclusion of some recent investigators was that in

the majority of these cases in the Army there was very little psychological disturbance. The cases of peptic ulcer seen in hospital tended to lose their symptoms with striking rapidity on dietetic treatment alone, and psychological disturbances did not appear to delay recovery. The kind of psychological factor which might be expected to operate was worry about business and separation from family; on the other side the men had the great relief of security of occupation. All the psychological factors operated in the last war (except large-scale bombing in this country), when the incidence of peptic ulcer and organic conditions of the stomach was reduced. The Registrar-General's returns of mortality showed, in respect of death from peptic ulcer, a flattening of the curve during the war period, the curve rising again after the war. There was no evidence that psychological or any other kind of disturbance increased the incidence of these conditions during the war.

Turning to the large number of cases of gastritis, Col. Tidy said that these, on the whole, were far more resistant to treatment than were those of peptic ulcers, and there was more likelihood of a psychological element in them. In the early months of the war it was supposed that these cases could be dealt with by marking the men down to a lower category, but they relapsed or their symptoms continued as definitely in category "C" as in "B" or "A." Yet many of them carried on and made useful soldiers. When they went back to their units it was the duty of the medical officer to keep them there if he could and for as long as he could, but if he failed they must go back to hospital. When these men had been twice in hospital they should be boarded out. They ought to have a second trial, and the medical officer should do all he could to keep them in the unit. He might, however, be faced with impossibilities. If a man vomited over the dinner table the M.O. was helpless, and it was astonishing how many of these men did vomit, owing to an unexpected appetite from the morning exercise and the temptation to eat a hearty meal.

Finally, there were the transient dyspepsias, which might affect healthy men on finding themselves in a very new environment. It often happened in the training centres that men reported sick with transient dyspepsia within a fortnight of joining the Service. If the M.O. was wise and experienced he would reassure them and give them a bottle of medicine (without the bottle they might be considered to be malingering). But if he was weak and inexperienced he would send the case to the hospital physician or a specialist, and if the latter lacked confidence he would admit the case to hospital. These men recovered or lost their symptoms very quickly and were sent back to their unit as "cured"; but they were not acclimatized, and soon the cycle started all over again. It was almost true to say that if a man was twice in hospital with the same complaint he was unlikely to develop subsequently into a useful soldier; he was converted into a case of almost incurable gastritis, and was actually more difficult to deal with than the cases of chronic gastritis in which the sufferers had over a course of years learned to deal with their disability. Cases of this group of transient dyspepsia ought not to be seen largely in hospital. It was extremely easy for medical officers—lacking rather in confidence than in competence—to magnify and multiply these cases.

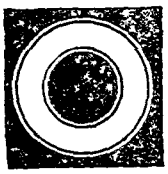
Differential Diagnosis

Dr. CHARLES E. NEWMAN said that three or four definite problems came up for discussion. One of them was the diagnostic problem of distinguishing duodenitis from duodenal ulcer: the choice between these two seemed to depend upon the preference of the local school of radiological thought. But surely they were all accustomed in civilian practice to diagnose peptic ulcer with negative *x*-ray appearances. In a reasonable percentage of cases gastroscopy revealed an ulcer which was not seen by *x* rays. Occult blood in the faeces was a valuable guide, though not a valuable negative finding, in the diagnosis of ulcer. Another problem was the ascertainment of an organic as distinguished from a neurotic condition. Psychological factors were very important in the causation of gastric disturbance, but many people thought of them in a loose way. Worry was regarded as a psychological trauma, and yet it was the common lot. A girl who had an illegitimate child was put down as suffering from psychological trauma, though to a strong-minded girl it would be not a psychological trauma but a physiological event. The assessment of the psychological factor seemed to him often very superficial. In many of the organic cases there was a neurotic element. The person suffering from gastric ulcer was usually rather abnormal in his mind—as, for example, Thomas Carlyle, than whom a more rampant neurotic could not be imagined. What really mattered was to find out whether one or both conditions existed and to treat both if both were present. He pleaded for some settled order in the examination of gastric patients; otherwise everything depended on the view which the examining doctor took of such cases. For some doctors they had a fascination, others regarded them with impatience. Unless handled by someone who had an interest in them the patients were not going to get a "fair deal." For some reason the Army liked the diagnosis "gastritis." This was the predominant diagnosis of patients sent from the B.E.F. last year. Fifty years ago gastritis was well recognized as a common disease, but with the coming of more accurate means of diagnosis it became not only unpopular but the last gasp of the destitute. With the advent of gastroscopy "gastritis" was reintroduced, but it was still not possible to say what was the normal and what constituted a departure from it. There was such a thing as gastritis, but it was a rare disease, and the vast majority of patients who formed this difficult group in civilian practice were not really cases of gastritis at all. Recently there had grown up a tendency to describe dyspeptic soldiers as suffering from "soldier's stomach," rather on the analogy of "soldier's heart." It was a term that did not mean anything at all.

Major J. G. SCADDING described an investigation into 137 cases of dyspepsia in the Army. In the large majority of cases the symptoms had started in civil life. Of fifty-seven in the proved ulcer group only six had their first symptoms during Army service; forty-one had had no operation. There was some difference between officers and other ranks; of the ten officers included among the 137 cases, as many as seven fell into the proved ulcer group. The average age of onset in this group was 26; in fourteen cases the symptoms had arisen before the age of 20. There was complaint of vomiting in 30% of the proved ulcer group, though in none was it the principal complaint, but in seventeen of the remaining eighty cases vomiting was the principal symptom. The psychoneurotic element was very difficult to assess. In only nine was an obvious psychological abnormality detected. How far this psychological element was favoured by the advertisements of patent medicines must be left to the imagination. Some of these advertisements were masterpieces of reversed psychotherapy.

Incidence of Peptic Ulcer

Sir ARTHUR HURST mentioned some remarkable differences between the incidence of ulcer in soldiers and in civilians. In private practice duodenal ulcer was about four times as frequent as gastric ulcer, though in hospital practice this did not obtain (in three of the large London hospitals the statistics, both clinical and post-mortem, over a good many years showed an equal incidence of gastric and duodenal cases). In the Army, apparently, duodenal ulcers were in the large majority. During the last year, working at Oxford, he had seen almost every gastric case admitted to the Radcliffe Infirmary; more than half were admitted on account of haemorrhage, but he understood that haemorrhage was extremely rare (under 5%) in Army cases. He wondered to what extent radiological evidence might be misleading. He saw a patient 35 years ago with the classical symptoms of duodenal ulcer; he got well under medical treatment and had no recurrence. Recently he saw him again for lumbago, when the patient told him he had never suffered from indigestion for the last thirty years but, to satisfy his curiosity, he persuaded him to have a skiagram taken, and the radiologist, who had been told nothing of the history, reported, "This man has duodenal ulcer." In how many soldiers was the old scar taken to mean an active condition? He wished there was some arrangement between the Army and the civilian hospitals for continuation treatment so that men discharged from the Army with their



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litions could be returned as soon as possible to civil loyment. A great effort ought to be made to come to a clusion as to which cases had gastritis and which had ous dyspepsia. In true gastritis a considerable proportion ases in hospital, on a strict diet and morning lavage, would and remain well; the prognosis in true gastritis was quite d. He entirely agreed about the most undesirable way which some of these dyspeptics were sent again and again hospital. It was this kind of thing which during the last gave rise to D.A.H. Cases of disordered action of the rt were comparatively rare in this war, but there seemed be some risk of a new disease—" D.A.S."

ieut.-Col. S. J. HARTFALL said that the incidence of a rotic condition among the dyspeptic patients under his ervation at the present time was about 60%. That did mean that they were cases of neurotic dyspepsia, but e were *quite a number which had ulcer—or had had ulcer* viously—and had manifest neurotic symptoms associated i it. He also said that in a group of eighty-nine cases of pepsia with negative indications for organic disease on y, occult blood, and test meal examinations, 60% were entirely negative on gastroscopic examination, and 20% a superficial patchy gastritis, sometimes fairly diffuse but very serious—the sort of condition that would respond mirably to rest in bed with gastric lavage. The remainder wed positive findings and included some cases of acute tric ulcer missed by the *x*-ray examination, and a larger nber of chronic gastritis with atrophic or hypertrophic nge.

Mr. R. T. PAYNE said that there was no doubt as to the ike with which many medical officers viewed these gastro-odenal cases. The sufferers were put down all too easily malingerers. In some investigations which he with Dr. wman conducted in the early part of the war very few lingerers were discovered. In that same investigation much dence was found of surplus movement of patients between spital and unit. Many mistakes in diagnosis were made ing to the ascertainment being left to the radiologist or someone who had not the benefit of all the data. The stroscope would help to elucidate some of the more difficult d obscure cases, though not all; it would help in particular resolve the big group known as gastritis. He was inclined quarrel with that word, and also with the large proportion cases assigned to this group by various observers. Colonel B. MARSH spoke as a Regular Army physician whose prac-e in the Army dated back from before the last war. The st thing that struck him at Aldershot in the early days was at the age incidence in gastric cases (which he found to 19 to 22) was much earlier than was stated in the litera-re (30 to 35). With regard to gastritis, he became accus-med to dividing the sufferers into two categories: the beer-inkers and the bun-eaters. In the old Army days the er-drinkers formed the larger group; now the bun-eaters ere in the majority. He had never heard the term "soldier's omach"; it was not an Army term. He added that in North-est India the young British soldier did not get ulcers, either uodenal or gastric. In five years in that part of the world came upon no more than two cases.

Colonel TIDY, in reply, said that while the term "gastritis" as not of his invention, he thought it as good as any, and obody had suggested an alternative. He deprecated the term soldier's stomach." The cases which went back time after me to hospital were more aptly called "hospital stomachs" ian "soldiers' stomachs." As to the proportion of duodenal lcers to gastric ulcers, on looking up the returns at St. homas's Hospital for a recent year he found that more gastric lcers were admitted than duodenal. In the Army the statistics aried between four or six cases of duodenal to one of gastric lcer. Another term for which he had no use was duodenitis"; he would include cases of this description for rmy purposes (though not for scientific purposes) as uodenal ulcer. One radiologist would constantly diagnose uodenitis where another would diagnose ulcer. On the sub-ct of malingering, he felt confident that the amount of alingering in the Army was practically negligible, but there as some exaggeration, especially among men who went into ospital over and over again. Such men were very unlikely be useful soldiers.

EPIDEMIOLOGY OF PULMONARY TUBERCULOSIS IN THE ROYAL NAVY

At a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on March 28, Surgeon Rear-Admiral S. F. DUDLEY introduced the subject of the epidemiology of pulmonary tuberculosis in the Royal Navy, especially as regards the use of miniature radiography in its elucidation.

He said that pulmonary tuberculosis had always been an occupational disease of sailors. From the beginning of the century until the present time the invaliding rate for pulmonary tuberculosis had fluctuated around 2 per 1,000. During a period in which, judged by mortality statistics, tuberculosis in England and Wales had been nearly halved, the prevalence *of tuberculous disease in the Navy had remained unchanged.* This was due to the factor of population density, which could not be eliminated or even reduced in the Navy. The purpose for which a warship was designed prohibited any increase of deck space per man, and more and more men were required to work the complicated machinery. A yearly incidence of 2 per 1,000 seemed to be the irreducible minimum. This was double the figure prevailing in the Army and the Air Force, although the Navy had a larger proportion of boys and men at those younger and older ages which in civil life showed a lower incidence of pulmonary tuberculosis than the average. The closeness of community life on the quarter-deck was the determining cause of tuberculosis among naval ratings. The yearly incidence among naval officers was less than 1 per 1,000, and they nearly always slept in separate cabins and their living accommodation was more spacious. When men were promoted to officers from the lower deck, the rate of tuberculosis among them dropped from 2 to 1 per 1,000.

Miniature Radiography for Mass Examination

All men in the Navy suspected of having pulmonary tuberculosis were at once examined by *x* rays. But it was the unsuspected cases which must be considered. Little effect on total incidence could be expected from the *x*-ray examination of recruits or limited numbers of contacts, and periodical examination by *x* rays of the total force by the usual technique was considered impracticable. Therefore mass examination by miniature photo-radiography had been introduced as a less cumbrous and expensive proposition, and the Lords of the Admiralty had given permission for the installation of the necessary apparatus and staff at the three main naval depots. Once the scheme was in full working order the chests of all men in the Navy would be examined at least once every three years. No man would be labelled tuberculous on the evidence of a miniature film until a full-size film had been taken; the function of the apparatus was to pick out as quickly and economically as possible the cases which showed abnormal shadows in the lungs.

Of the first 18,000 cases taken, about 7,000 of the subjects were trained men, the others being new entrants. The numbers re-examined and the results of the examination were as follows:

	Re-examined (Full-size Radiograph)	Percentage Re-examined	? Active T.B. (per 1,000)	Active T.B. Established
Trained men ..	269	4.0	31	4.5%
New entrants ..	403	3.4	33	3.2%

With regard to the ultimate effects of mass radiography as a preventive measure, they could only hope that if pulmonary tuberculosis in adults was generally due to fresh infection, by means of miniature photo-radiography it would be possible to reduce the risk of fresh infection so that it might soon become a rare event for tuberculous illness to be contracted on the lower deck of H.M. ships.

Surgeon Commander W. G. C. FITZPATRICK added some technical details. The work was done with a specially designed apparatus called the "pulmograph," carrying 35-mm. film. A light-proof tunnel connected the *x*-ray tube, the camera, and a screen on which the image was photographed. The film was exposed on deep inspiration, the exposure varying from

0.3 to 0.6 second according to the man's weight. A device was included for photographing the number of a card identifying the subject. After processing and drying, the film could be viewed by the naked eye, when any gross lesion could be detected, or as a projected image, when lesions were easily seen. About 200 exposures an hour could be made. Any case which showed any abnormality at all was sent for further examination.

Discussion

Surgeon Commander A. R. THOMAS referred to some work already done by various workers in mass radiography. De Abreu in Brazil had examined 14,000 cases, revealing lesions in 3.78%; also 10,000 cases among workers in food trades, revealing lesions in 3.4%. Berner of the German Army had examined 55,000 cases, all of them picked men (storm-troopers), and 1.5% showed tuberculous lesions. Jullien and others in France had examined 145,313 cases, not by photography but by the screen method, and the number of lesions found was only 0.18%. Dr. P. ELLMAN said that this was a unique method for the preventive medicine of the future. There was no doubt that when a patient with pulmonary tuberculosis was sent to a chest clinic with symptoms he was very likely (in 75% of cases) to have comparatively advanced tuberculosis. The problem was to deal with the asymptomatic case. Dr. W. M. CROFTON said that the figures given for incidence in the Navy were evidently reliable, but they ought not to be compared with the figures for the civilian population, which were unreliable. He had never understood why the subcutaneous tuberculin test had been given up. It was not a question of lighting up a dead lesion but of producing a condition of immunization.

Sir WILSON JAMESON said that one of the problems that must inevitably trouble them at the present time was the likelihood of the same unfortunate incidence of pulmonary tuberculosis in young adult females as occurred in the last war. The only thing that could be done was to endeavour to use some better method of diagnosis. The difficulty of using a method of this kind in relation to industry was that if large numbers of people in industry were examined and a certain number of them were found to be infected they must be stopped from working, whereupon their wages would cease and they would go on sickness benefit. This would happen to a great many people who were at present continuing in industry with their incipient tuberculosis. Nevertheless, this sort of examination was being carried out in a limited way in industry with the consent of employers and staffs. He understood that in the United States a camera of somewhat larger size was being used. That this method of examination should be introduced and pushed to the utmost he had no doubt at all.

Questions on the technique of the apparatus were asked by Dr. COCHRANE SHANKS and Dr. CRANCH, and Dr. R. CRUICKSHANK raised the question whether infected dust was not a greater danger than droplet infection in spreading tuberculosis on board ship or in confined spaces.

Surgeon Rear-Admiral DUDLEY said that, while such methods as these were by no means ideal, when it was a question of dealing with large numbers of men speed was essential. He did not agree with some complaint which had been made against the other Services on the ground that they were not trying the procedure. The method was on trial in the Navy; not all the people in the Navy were as yet going through this examination; and the Navy was the first in the field because the tuberculosis problem was much more a naval than an Army or Air Force problem.

SOME PROBLEMS IN ORTHOPAEDICS

The postponed 1940 annual meeting of the British Orthopaedic Association took place at Oxford on January 3, under the presidency of Prof. T. P. MCMURRAY. The meeting, which was well attended, was devoted to the presentation of short papers.

Fractured Neck of Femur, Late Results.—Mr. A. L. EYRE-BROOK and Mr. K. H. PRIDIE (Bristol) said that forty-seven patients out of a total of seventy-five treated by manipulative reduction and the insertion of a Smith-Petersen nail (Hey Groves technique) had been reviewed by clinical and x-ray examination at least one year after the procedure. Bony union was proven in 58% of patients, and in the whole series of seventy-five there had been a mortality of 5.3%. Aseptic necrosis of the capital fragment had occurred more frequently in patients under 30 years of age. The importance of the fracture-shaft angle of Pauwels was emphasized; if this angle was low (below 30°), the results from nailing alone were poor; a fibular graft should be inserted as well.

Excision of the Patella.—Mr. NORMAN ROBERTS (Liverpool) based his communication on twenty patients in whom the patella had been excised. He discussed the uses of the patella and emphasized the following points: (1) Recovery of function after excision is not so rapid as is often thought, though it is more rapid than after suture of the patella. (2) After excision, flexion movement is usually full or is possible at least to the right-angle; there is often a limitation of full extension and the quadriceps is often weaker than normal. (3) Excision is advisable in all comminuted fractures in both young and old patients, and in transverse fractures in middle-aged and old patients. (4) Transverse fractures in young patients should be sutured. If the fragments are markedly unequal in size it is easier to excise the smaller fragment and to suture the rectus or patellar tendon efficiently to the larger fragment. (5) Derangement of the knee due to recurrent dislocation of the patella cannot usually be cured by excision of the patella. (6) Good results sometimes, but not always, follow excision in osteo-arthritis of the knee, particularly if the arthritic changes are mainly in the patello-femoral compartment of the joint.

Correction of Scoliosis.—Mr. G. E. THOMAS (Liverpool) observed that in sixteen patients correction of the deformity had been achieved in the majority by recumbency on a Thomas frame with longitudinal traction and counter-traction applied via the head and legs and "three-point" pressure on the apex of the convexity and the extremities of the concavity. To exert lateral pressure special pads operated slowly by a screw mechanism of the Thomas wrench type were employed. Failure to achieve correction had occurred in very high and very low curves, in severe long-established curves, and in those cases in which there was gross rotation out of all proportion to the lateral curvature.

Fractures of External Tuberosity of Tibia.—Mr. W. S. DIGGLE (Liverpool) reviewed a personal series of these difficult fractures. For those cases in which there was gross comminution and depression of the fragments he had found open operation, replacement of the fragments, and screw fixation the most effective treatment. Most of his patients treated in this way had been able to return to work in about six months.

Compound Fractures of the Leg.—Mr. G. K. MCKEE (Norwich) advocated fixed skeletal traction on a Thomas splint for both tibial and femoral fractures, simple and compound. For tibial fractures a Steinman pin was inserted transversely through the upper tibial fragment and through the os calcis or the lower fragment. The pins were fixed firmly, after reduction by manual traction, to the lateral bars of the Thomas splint by a special clamping device. For fractures of the femoral shaft one pin below the fracture, fixed in a similar way to the Thomas splint, was employed. To avoid undue pressure on the ischial tuberosity or groin the splint was tied to the end of the bed, which was then elevated.

Keinboch's Disease.—Mr. F. C. DWYER (Liverpool) considered that this peculiar affection of the carpal semilunar was probably due to a fibrosis, resulting usually from trauma, of the dorsal ligaments attached to the bone. From an experience of thirty-four patients, in ten of whom the damaged semilunar had been removed, Mr. Dwyer felt that conservative treatment offered the optimum results in a condition which in any event always resulted in a permanently damaged wrist.

Nerve Regeneration and Nerve Grafting.—Mr. J. L. YOUNG, M.A. (Oxford), outlined the preliminary results of experimental work now in progress at the University of Oxford on nerve regeneration and nerve grafting in rabbits. At the start he warned against too closely applying experimental findings to man, even though they had been very accurately demon-

strated in animals. The need for a qualitative method of comparison between different procedures for nerve repair was emphasized. The rate of growth of new fibres was adopted as a criterion and a method of estimating it developed. The rate for rabbits was found to be about 4 mm. a day, was the same in all nerves, and was approximately the same at all levels. Certain suture material occasioned severe reactions—for example, catgut and pigmented silk. White silk, woman's hair sutures, and fibrin "glue" produced the least reaction. Return of function was often rapid, and it was stressed that such rapid recoveries took place after full Wallerian degeneration—they were not due to "physiological interruptions" such as could happen after ischaemia but which cleared up even more rapidly.

Mr. Young pointed out that between interruption and recovery of a nerve's conduction there was delay at three points: (1) In the junction scar—probably about twenty days in man. (2) In the nerve itself during the growth of fibres down it. This was probably at the rate of 2.5 mm. a day in man. These two phases comprised the anatomical delay. (3) In the muscle—the functional delay—about forty to sixty days in man. The delay in the muscle seemed to be shorter if the muscle had been denervated for only a short time—a finding strongly in favour of early suture.

The problems of bridging gaps were discussed. It had been demonstrated that nerves could not be stretched suddenly more than 10% of their total length, and that increase in length from gradual stretching was probably due to actual growth in length of the nerve rather than to stretching. For grafting, autografts had given most success in rabbits, and there were some encouraging results from homografts.

SOME POINTS IN TRANSFUSION

At a meeting of the Shaftesbury Military Hospital Medical Society on February 18 Colonel L. E. H. WHITBY, in a paper on transfusion for war conditions, said that the modern employment of large infusions had rendered gum-saline and haemoglobin-Ringer solutions less generally useful, as in large amounts the former impaired the oxygen-carrying power of the red cells, and the latter might be dangerous unless the urine was kept alkaline. An objection to the use of serum was that it could not be freed from agglutinins and might cause reactions if given in large amounts. Citrated whole blood and pooled agglutinin-free plasma were the fluids adopted for general use by the Army, and would meet all requirements if employed with due regard to the physiological principles involved. In the case of air-raid casualties who had been quickly removed to hospital, post-haemorrhagic physiological changes were minimal: there was no dilution of the blood, the haemoglobin percentage was normal, and there was no secondary shock. In these cases plasma alone was required. Soldiers evacuated from a battlefield, however, would not have been in a position to receive treatment until blood dilution had occurred, and here the indication was for transfusion of blood, both to restore oxygen-carrying power and to combat shock; saline infusion in addition was most valuable for overcoming the tissue dehydration which these delayed casualties suffered, in that haemodilution took place at the expense of tissue fluid. In both cases the subjects contrasted with those commonly requiring transfusion in peacetime practice in that they had been previously healthy and had no cardiac disability; it was therefore safe to give at least two pints of blood or plasma quickly to anyone with a blood pressure consistently below 100 mm. Hg, and then to continue a slower drip-transfusion before, during, and after any operative treatment. If blood derivatives were being used, it was wise to give one pint of whole blood for every three pints of these.

The Trustees of the Bernhard Baron Decd. Charities Fund have sent the final instalment of £2,000 towards the promised £10,000 for a new maternity wing at the Royal Northern Hospital, Holloway. The projected building has had to be postponed until after the war.

Correspondence

Delay in Treatment of Air-raid Casualties

SIR,—I hope your post will bring you many more letters in support of Mr. Norman White's view (March 22, p. 459) that there is unnecessary delay in the treatment of air-raid casualties in London due to the present policy of sending all the casualties from a major incident to one hospital. Hospital authorities have shown some diffidence in referring this problem to their Sector Officers, and have indeed on more than one occasion recorded with pride that after a night raid they had operated till late the next day, while the staff of another hospital less than half a mile away had stood by doing nothing.

It is to be hoped that the Central Medical War Committee will bring strong pressure to bear on the responsible authorities to rectify this failing in an otherwise excellent medical service. The solution would appear to be a simple one—namely, that under present conditions no more than two ambulances should proceed from the site of an incident to any one hospital.—I am, etc.,

London, W.11, March 22. H. STEPHEN PASMORE.

SIR,—Mr. Norman White has raised an important point in your columns. He has shown that in London all the air-raid casualties from one "incident" may be taken to the nearest hospital, no doubt in a praiseworthy effort to obtain the quickest treatment, whereas another hospital at no great distance away may have no casualties at all. Thus there is delay in actual treatment. The same is the case on Merseyside. It has happened that hospitals in one district, sometimes actually damaged by bombing, have had more casualties than could be dealt with, while other hospitals in the same area, easily accessible by ambulance within a short time, quite undamaged and with an enthusiastic staff ready, have received not a single casualty from the whole raid. Experience has shown that many of these casualties require laborious and time-consuming treatment, and that, indeed, one case may require the work of a whole team. Such treatment cannot adequately be given when there is a great rush of cases, and may become impossible if supplies of water or electricity or the black-out become interfered with by enemy action.

Although the importance of early treatment, first shown in Spain, is now generally realized, it would seem that excessive regionalization in the disposal of cases is defeating its own object, and the magnificent work of all those A.R.P. workers and ambulance drivers who strive so much to bring patients to treatment at the earliest possible moment is being made of no avail by the delay that must occur in hospital with the present arrangements.—I am, etc.,

Liverpool, March 30. BRYAN WILLIAMS.

*** The distribution of air-raid casualties is discussed in an article by a special correspondent at page 526 and in a leading article at page 518.—ED., *B.M.J.*

Dyspepsia in the Army

SIR,—Most of the articles which have appeared in the *Journal* on chronic dyspepsia in the Army have been concerned primarily with the incidence of intrinsic organic lesions of the stomach and duodenum in men who have reported ill with "stomach trouble." Payne and Newman (*Journal*, 1940, 2, 819) point out that during the period between the dispatch of the B.E.F. and April 29, 1940, 12.5% of all cases evacuated to the United Kingdom had a primary diagnosis of gastric or duodenal disease. The great majority of these men were shown on radiological investigation to be suffering from chronic duodenal ulcer. Morris (*Journal*, 1940, 1, 1008) recorded the radiological findings in a series of 500 soldiers examined at a military hospital since September, 1939. In about 50% there was positive *x*-ray evidence of chronic gastric or duodenal ulcer. During the last year 256 soldiers have been referred to a general hospital on account of dyspeptic symptoms; these all had a barium meal *x*-ray examination, and the findings were as follows: gastric ulcer, 15 (5.8%); duodenal ulcer, 128

(50%); no ulcer discovered in the stomach or duodenum, 113. In other words, in this small series over half the cases were shown to be suffering from chronic peptic ulceration, and these figures run parallel with those recently published by Morris.

It may be stated, therefore, that if all the chronic dyspeptics in the Army who are referred to large general hospitals were examined radiologically it would be found that destructive lesions of the stomach and duodenum were present in fully half of the cases. Under existing circumstances, however, the true incidence of chronic ulcer of the stomach and duodenum will never be accurately assessed, because there are still a host of officers and men in the fighting Forces—a number of them holding key positions—who, although suffering from these conditions, prefer to treat themselves rather than report their condition to their medical officer. They know full well that if on x-ray examination a gastric or duodenal ulcer is discovered they will be invalided out of the Army without further ado. Those men, therefore, who wish to continue their services with the Forces (and I hold that the proportion of such men is high) find themselves with only two alternatives: either they must report themselves to the medical officer and risk discharge from the Army or they must refrain from reporting their condition and must take a chance on the subsequent development of complications.

It is claimed that as the majority of the men proved to be suffering from these lesions have already been dismissed from the Forces, chronic gastric and duodenal ulcers are no longer a problem in the Army. This, however, is incorrect. The incidence of chronic peptic ulcer among the adult population in Great Britain at the present time is about 12% to 15%, and there is no reason why this incidence should not be approximately the same among those serving in the Forces. If it is conceded that this estimate of the incidence is accurate, chronic ulcer of the stomach and duodenum will continue to be a very serious problem, which will, sooner or later, have to be faced and faced boldly.

I submit that those who are shown to be suffering from chronic peptic ulcer and who wish to be invalided out of the Services should be accorded this opportunity, as such subjects are unlikely to prove co-operative whatever line of treatment is adopted. But those similarly affected who, on the other hand, wish to continue to serve with the Forces should be given every facility for being treated in specially staffed and well-equipped hospitals set aside exclusively for the management of these cases. If carefully supervised medical therapy were applied thoroughly and efficiently in such specialized hospitals a large number of these soldiers could be rendered symptom-free and fit for further service; and the majority with chronic callous lesions or complications which demand operative treatment could, following such surgical measures, be placed in a graded position for a probationary period, and those proving to be satisfactorily cured be returned in due course to their units.—I am, etc.,

London, W.1, March 21. RODNEY MAINGOT, F.R.C.S.

Crush Injuries

SIR,—The articles on "Crush Injuries" in the *Journal* of March 22 are of intense medical interest, especially as further investigation of such accidents might result in combating successfully the syndrome referred to and therefore in saving lives.

A large proportion of the fatal accidents in mines result from crush injuries, many of them similar to those which are brought about by air raids. The experience and views of surgeons who deal with a large number of such cases in coal-mining areas would therefore be of immense value and greatly appreciated.—I am, etc.,

S. W. FISHER,
March 31. H.M. Medical Inspector of Mines.

SIR,—It may seem an impertinence for one with no experience of these injuries to write, but on reading the articles in the *Journal* of March 22 I felt that some ideas might justifiably be put forward.

During the time—a few hours or maybe days—that a person is buried under fallen masonry there is a continual loss of body fluid. There is the loss of intake fluid that the person would have taken during that period, and there is the loss that goes on ceaselessly during breathing. As this loss goes on the blood fluid must decrease and therefore the blood salts become more concentrated. The case becomes one of lowered blood volume and a resulting diminished renal blood flow. The *Journal* states, "Attempts made to explain the rising blood urea of hypochloraemia, gastro-intestinal bleeding, Addison's disease, diabetic acidosis have usually invoked the idea of lowered blood volume and diminished renal blood flow." Again, it states that "these cases resemble the toxaemia of severe burns"; but the ill-effects of a burn are in direct proportion to the loss of fluid from the body due to the burn: so again the condition is due to the loss of body fluid.

In crush injuries we have not only a loss of fluid but also the effects of pressure. This pressure forces the blood from the part, and incidentally helps to prevent collapse by sending the blood to the brain, heart, and lungs. Where there has been a great loss of blood we bandage the limbs to force the blood to these parts. In crush injuries the weight does this.

To prevent caisson disease the chief treatment is slow decompression. Is it not permissible to take this as an analogy and copy it? When the weight is removed in a case of crush injury there must be a sudden expansion of the limb and a quick suction of blood into the part. This sudden suction must cause numerous slight extravasations of blood, and the sharp withdrawal of blood from the brain must lead to collapse. Would it not be better to have slow decompression in these cases? It would not be possible to withdraw the debris slowly, but it would be possible to bandage the part tightly as it becomes exposed. This bandage could then be slowly slackened over a period of time, and during this time fluids could be administered to make up for the fluid loss and to decrease the concentration of the blood.

The *Journal* also stated that "the pathological appearance of the kidney is said to have borne a resemblance to the transfusion kidney." Is it not possible that it *is* a transfusion kidney? In severe bleeding there is a loss of all the constituents of the blood, while in these cases there has been a loss not of all the constituents but only of the fluid part. This may have an effect on the blood transfusion.—I am, etc.,

Stewarton, Ayrshire, March 26. E. R. LLOYD.

SIR,—I have read with interest the accounts of renal failure supervening on crush injuries given in the *Journal* of March 22.

I think possibly toxic substances or toxins from the crushed muscles are absorbed into the blood and act on the kidney tubules as poisons. First the renal system is thrown out of gear, then secondary effects are observed in the blood and on other systems (e.g., lungs and heart). I think plenty of glucose would neutralize these toxins. I had once a very bad case of burns to treat—a child under 2 years with a large area of body surface burnt. Supposing that toxins must be absorbed from this large surface, I gave her as much glucose fluid as she would take—indeed, pushed it. (The burn was dressed with silver nitrate and tannic acid.) The child got jaundice and later nephritis, but was still given as much glucose as possible and recovered.

I do think that glucose somehow or other neutralizes toxins which may for the time being prove too much for the kidneys. Anyway, I think it is worth trying—both in drinks and in light diet; it should be pushed in as large quantities as the patient can be persuaded to take.—I am, etc.,

Liverpool, March 27. FLORENCE M. E. DAVIES.

Cerebral Venous Thrombosis after Childbirth

SIR,—The speculation conveyed in Dr. J. Shafar's letter (March 22, p. 455) has been in my mind also since I read the annotation on Batson's work (*Ann. Surg.*, 1940, **112**, 138) in the *Journal* of February 22 (p. 284). The paper by Dr. Sheehan and myself (March 8, p. 349) had been submitted for publication some time before the annotation appeared, and we were not aware of Batson's article, but in connexion with certain cases of thrombosis in the superior longitudinal sinus following childbirth, which I hope to report soon, the question had been persistently in my mind whether the thrombus in the sinus could not be in some way metastatic. When I read of Batson's findings I realized that it could. It is most tempting

to suppose that a minute fragment of clot, carried up through the vertebral system of veins, might lodge in an irregularity of the wall of the sagittal sinus and form the nucleus of a new clot, but I do not know yet whether the pathologists will support this theory; in Case II of our paper no such nucleus was found in what appeared to be the primary clot. If the fragment found its way into a superior cerebral vein it might conceivably act as an embolus, but it seems more likely that a secondary clot would have to be deposited on it before blockage occurred; that, however, is a minor point. I may say that one of my cases of sinus thrombosis lends further support to the theory of metastasis via the retrothecal veins, because the patient developed a spinal lesion as well; but, on the other hand, it must be admitted that the rarity of spinal lesions provides an argument against the theory.—I am, etc.,

London, W.1, March 27. J. PURDON MARTIN.

The New Price of Insulin Preparations

SIR,—You were good enough to publish recently a plea for the use of the stronger solutions of insulin (*40 and 80 units c.cm.*) instead of 20 units on the ground of *national* economy—fewer bottles needed, less packing, less labour. Now the price of insulin has, I suppose inevitably, been raised to cover increased costs, and the argument of *personal* economy has been added. The following figures show that the retail increase is much greater in the weakest solution of insulin, and that the increased price can be largely offset by changing to more concentrated insulins.

Strength	Cost per 100 Units of Soluble Insulin	
	Old Price	New Price
	s. d.	s. d.
20 units/c.cm.	1 0	1 5
40 units/c.cm.	11½	1 3
80 units/c.cm.	11	1 0½

It is clear that the increase in price can be largely avoided by using the stronger concentrations. The clinical effect is the same with all strengths, but may I emphasize the bulk of the injection must be *halved* or *quartered* to correspond to the stronger concentrations—otherwise hypoglycaemic disaster.—I am, etc.,

London, W.1, March 27. R. D. LAWRENCE.

Continuous Pentothal Anaesthesia

SIR,—Dr. Hastings Moore's description of the complications of pentothal anaesthesia (March 22, p. 462) suggests that his patients either do not receive premedication or receive preoperative atropine.

1. *Fibrillation of Muscles.*—Common with evipan and rare with pentothal, especially so after morphine.

2. *Sudden Muscular Contraction.*—Always due to too light anaesthesia and occurs less frequently with growing experience. The arm should always be so fixed as to prevent flexion of the elbow.

3. *Very Shallow Breathing.*—Should never be accompanied by cyanosis if the airway is clear. Continuous pentothal should not be employed by those inexperienced in its technique except in the presence of someone who is so experienced.

4. *Persistent Coughing.*—Commonest in patients who have not received premedication, and frequently initiated by an artificial airway. The orthodox view[1] is that further injection should be withheld, the cough and subsequent laryngeal spasm being due to a stimulant effect of the barbiturate on the parasympathetic nervous system.[2] It is exceedingly dangerous to increase the dosage as the respiratory centre is further depressed and the tendency to laryngeal spasm increased. Coughing will cease spontaneously, but may be cured by intravenous injection of 5 c.cm. of coramine or 2 c.cm. of cardiazol. Cyanosis with laryngeal spasm calls for most urgent remedying.

5. Doses of 2 grammes of pentothal are excessive. Prolonged post-operative sleep, with its attendant complications, led to the abandonment of the older barbiturates as anaesthetics.[3] Although pentothal is clinically innocuous, severe liver damage has been reported in experimental animals,[4] and Maclagan's results[5] suggested a mild degree after anaesthesia in human beings. In view of this it seems imprudent, except in emergency, greatly to exceed the dose of 1 gramme recommended by the makers. Pentothal can satisfactorily be followed or supplemented by nitrous oxide,[6] and the dose is reduced by at least one-third after morphine. It would be regrettable if one of the most valuable drugs available to us were to fall into disrepute as a result of its misuse. An artificial airway should not be necessary on leaving the theatre and, if used, should be lubricated with vaseline containing percaine or decicaine to dull the local reflexes.

Post-operative restlessness has not been found in some thousands of cases where morphine had been used beforehand, and would be more likely to follow large than small doses.[6] A thrombosed vein, without symptoms, was found in my arm one week after intravenous pentothal. In view of this Dr. J. B. Wyman has undertaken a most painstaking research into its *frequency and causation, preliminary reports from which* suggest an incidence as high as 25%. The fundamental point is that continuous pentothal anaesthesia is entirely safe only in the absence of cyanosis. Anything else is of minor importance.—I am, etc.,

GEOFFREY ORGANE, M.D., D.A.

Westminster Hospital, S.W.1, March 24.

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Calcium Requirement

SIR,—Possibly you will be good enough to allow me to rectify a misunderstanding. "Children and pregnant women require other items of food as well as calcium which can only be supplied by milk. The latter cannot be replaced by bread calcium." They require first-class protein, for instance, and other items as well. Since milk must be given in any case to children and pregnant women for the sake of the many items of food they require, they are bound to get the necessary quota of calcium. Moreover, the work of Meulengracht (Meulengracht, E., and Meyer, A. R., *Acta med. scand.*, 1937, **92**, 584) suggests that where calcium deficiency is a factor the condition cannot be regarded as a single deficiency but a combination, and they had to treat those cases with vitamin D as well as with calcium. This suggests that bread calcium would not help this type of case.

You say there is no proof at all that "a large number of middle-aged people who exhibit evidence of kidney damage, etc., would suffer injury from this extra chalk." That a large number of middle-aged people do exhibit evidence of incapacity of normal renal concentration is a fact in support of which many of your readers will bear me out. Polyuria, and particularly nocturia, is a manifestation of defective renal concentration. If we include border-line cases who later develop more pronounced signs the number is very large indeed. I have been working for a good many years on this problem. It will be seen from our monograph *High Blood Pressure* that under certain conditions when the calcium intake is increased the work of the kidney due to calcium excretion may approach urea excretion values. It must be borne in mind that a slight increase in calcium intake may cause a considerable rise in the kidney work. But apart from kidney work it is an established fact referred to in our paper that calcium interferes with renal function. To increase the load on the kidney in such cases is as rational as to make a heart-failure case climb Snowdon. We must bear in mind that there will be the cumulative effects of calcium intake extending over a number of years. I say with the same certainty as that two and two make four that large numbers of middle-aged people would suffer injury if calcium were added to bread.

Finally, I would like to make the following point. The evidence, such as it is, which might justify the Government proposals is based on pre-war conditions. You do not accept this evidence, for you do not recommend the perpetuation of the "reform" after the war. I am not aware that there has

been an exhaustive inquiry with regard to the calcium problem under present conditions. Your leader, therefore, is merely an expression of opinion. This is not sufficient to justify such a drastic measure. Our paper was concerned solely with the scientific side of the problem. Clearly if you believed that the "reform" is scientifically sound you would not advocate its discontinuation after the war. I am glad that on the broad issue there is agreement between us.—I am, etc.,

Liverpool, March 22. I. HARRIS.

Calcium and Arteriosclerosis

SIR,—I have read Dr. Harris's letter on calcium and arteriosclerosis (March 22, p. 460) and also your editorial comment, and it appears to me that the politically supported therapy of communal dosage with calcium is just as "shot-gun" as Dr. Harris's communal deprivation of calcium. In both cases some people will benefit and others suffer, and the precise ratios of these are inevitably unobtainable. My own preference is towards the ideas of Dr. Harris, which are at least less expensive, less artificial, and more rational.

From the theoretical point of view, it seems to me that the quandary arises not so much from the "unprovability" of the ultimate analysis of the variations in the human blood as from the *static* concept of pathological processes which is still in the minds of many medical scientists. Thus, a man of 55 walks into the surgery and his condition is diagnosed as arteriosclerosis or other cardiovascular degeneration, and it is presumed that this condition is new or at least of a few years' duration. It is my belief that the seeds of arteriosclerosis, etc., are sown in the first five years of life in a soil that is present even before that early age. The *dynamic* concept of pathology postulates that "the child's diet is father to the man's arteries," and this should serve to direct the attention of calcium research workers towards the investigation of the blood of children and young people. The amassing of vast accumulations of research data, which must sooner or later reach the dustbin, seems to me regrettable when there are so many fruitful fields for research brains. The rationale of calcium therapy involves the important question of the reversibility of pathological cellular reactions and processes, and while I believe this reversibility is possible in early life, and in some cases of adult life, I think that such reversibility must disappear with age.

The lesson is clear: we cannot undo arteriosclerosis (just as we cannot surround every brick in an old slum dwelling with new mortar and cement), but we can prevent arteriosclerosis by diverting scientific, aesthetic, sociological, and political attention to those potential arteriosclerotics of to-morrow—the children of to-day. Until then, the human "slum dwellings" must be buttressed as patiently as possible. In general practice, the problem is patience, not patients, and in any case "the treatment of arteriosclerosis is a regimen, not a drug."—I am, etc.,

Kearsley, Lancs, March 22. D. OCKMAN.

Medical Planning Commission

SIR,—I have read with much interest the correspondence on the Medical Planning Commission which has been appearing in the *Journal* for several weeks. I feel that the B.M.A. is to be congratulated on having set up such a Commission and not waited for the Government to force its own plans on us, maintaining that we have no plans of our own. The medical services, including the general practitioner service, call for better organization; why not plan this ourselves?

For a time correspondents seemed almost entirely concerned with the constitution of the Commission—whether a sufficiency of general practitioners, of young men, of women had been selected to serve. While feeling that all these groups should be represented, the proportions seem to be of minor importance. Frankly, I consider the proportion of able men is greater in the ranks of the consultants than in those of the general practitioner, while conceding that the most brilliant man or woman may be found in the latter. But what we need is people of the reforming spirit, with knowledge and reasonable respect for the past. The reforming spirit may burn more fiercely in the elderly than in the young, and I have found junior colleagues with over-much respect for past traditions.

But lately a change has come over the correspondence, and writers, eschewing criticism of the composition of the Commission, are coming forward with suggestions for the Commission to consider—surely a more fruitful course to take. No better suggestion has appeared than that put forward under the title "Give Us the Tools," by Dr. Montuschi (March 22, p. 458). There should be no difference of opinion about the necessity for providing the general practitioner with proper tools, the means of investigating his patients thoroughly—means possessed at present only by the hospital staffs,—without which he cannot—*pace* Dr. Montuschi—even diagnose anaemia. But Lord Dawson of Penn, in his Cavendish Lecture in 1919, put forward a scheme providing everything Dr. Montuschi wants, yet little in the intervening years has been done to put this scheme into operation, and I conclude from the absence of any support from him, when I have on various occasions attempted to awaken interest in the scheme, that even its author has lost heart. Is not this because we have been over-much engaged in consideration of remuneration to the disadvantage of service?

I am convinced the reorganization of the medical services on the lines advocated by Lord Dawson would be a great advance from the conditions now prevailing, and would restore to us the public respect, which I fear we have been losing.—I am, etc.,

London, W.8, March 25. HAROLD H. SANGUINETTI.

SIR,—Much has been written since the details of the Medical Planning Commission came out, the objects of which are to study wartime developments in relation to the medical services of the country. The sum and substance of all this correspondence is that there is widespread dissatisfaction with the representatives elected to serve on this Commission. To boil down the facts to a minimum: What is the question that is troubling every medical man—whether in the Services or not—to-day? Is it not, Are we or are we not going to have a State Medical Service after this war is over? If we are going to have a State Medical Service, then there are two sides from which we must view the question: (1) the outlook and views of the medical profession on the subject; (2) the equally important observations of the general public.

If we consider the first of these, let us here and now admit that the B.M.A. does not represent the whole of the medical profession. Much as that is to be deplored it is nevertheless the truth. Therefore, if the B.M.A. desires the thorough backing of the medical profession it would be well if it were to try to find out the views of every member of the profession, whether in the B.M.A. or outside it. Surely it would be worth sending out to each medical man a simple questionary, sounding his views on this most vital problem.

Second, and probably even more important, would it not be a good plan to try to find out just what the patients might think of it all? After all, they would probably be even more affected than we would by the change. A simple, plainly worded circular stating the changes that would take place and how they would affect the patient and his relations with his doctor could quite easily be devised. Each medical man could be supplied with a quantity of these circulars enclosed in stamped addressed envelopes. These could be distributed to his patients as they attend at the surgery, and their co-operation in answering them could be solicited. From both sides this would yield valuable information, and would be a good foundation on which to build up future plans. Then there could not be any grumbling that every effort had not been made to try to get the real opinion of all concerned in the matter.

In general it will be admitted that the younger generation lean towards a State Medical Service, while the older practitioner is much more sceptical of this change. I agree with Dr. Illingworth in his letter (March 8, p. 381) that hospitals could be run on a much better system. It is ridiculous that some hospitals should always be crying out for funds while others have plenty and to spare. It is the average man in the street, who gives least towards the hospitals, who requires their services most, so why should they not be financed and run by State funds? Better pay, too, for house-surgeons and members of the nursing profession is indicated. Just because the volun-

tary hospitals think that a doctor is only gaining experience they put him off with a trivial salary, regardless of the fact that he has still the responsibility to shoulder. Again, after this war is over the voluntary hospitals will not be able to depend on big individual donations, as there simply won't be the money about. I think, too, that hospitals should have full-time surgeons attached to them, who would be paid an adequate salary for the work they do in the hospitals and who would not be dependent for what they earn on their private outside work.

When it comes, however, to roping in the average general practitioner as a State servant I am not so sure that this move would be for the good either of the profession or of the public. For the profession it would make the science of medicine very much in the nature of a job to be done regardless of any personal feelings, and individual initiative would be very liable to suffer. For the public it certainly would disturb that essential personal element which is so bound up in the work of a general practitioner. No doctor who has been in general practice for any length of time will deny that the best practitioner is often not so much the one who knows all about the most obscure diseases as the one who has the personality to get the confidence and trust of his patients. I am sure it is on this point that the general public will have much to say.

I do not say that the panel system is a good one or that an extension of it is much to be desired. It is the best of a bad system, and actually in the more rural districts and smaller towns it works quite well, where the doctor has the time to treat his panel patients just as he does his private ones. It is in the large industrial centres that the panel system falls down, and patients are treated not so much as human beings but as so many nonentities who have to be pushed out of the surgery in double-quick time, simply because the doctor has not the time to devote to the work. Was this system accepted *en bloc* by the medical profession as a united body? The answer is very much in the negative, and yet here we have been, for the past thirty years, labouring along enduring a system which was none of our making. And is not this going to happen again unless the profession gets together and the consensus of opinion is found? If a State Medical Service is imposed and it does not work out as its advocates thought it would, what good will it be twenty years hereafter to say that it was not of our making?

I think this is an excellent opportunity for the B.M.A. to gain the support of the whole of the profession by finding out the opinions of each individual member and using this as a basis for future developments rather than trusting to the conclusions which a Medical Planning Commission may come to. It certainly would be the more democratic way.—I am, etc.,

J. M. MUIR, M.B.

Thongsbridge, nr. Huddersfield, March 19.

SIR,—Dr. Alfred Cox (March 15, p. 419) makes the astounding statement that "young doctors, unless they are predestined medical politicians, are usually too busy making their careers to take much interest in medical affairs." This strikes me as a typical example of the official or "headquarters" mind. It would be a bad day for England if only those who were predestined politicians or belonged to the select company at Westminster were capable of legislating for the future, and it will be an equally bad day for the medical profession when its future is entrusted entirely to those who have held high position in various departments or found favour at headquarters. The younger doctors are interested, vitally interested, in medical affairs, but it does not follow that they are always able or free to voice their opinions at B.M.A. meetings.

As a member for many years and an office bearer, I am becoming more and more impressed by the number of worthy men with ideas who are outside the ranks of the B.M.A., who sooner or later will become an "official" opposition as mentioned by Dr. W. Lyle (p. 420). And they are outside not because they are uninterested in medical affairs, but because they have in the past come up against the official type of mind which sees little wisdom in youth and now considers that the members of the Medical Planning Commission should be chosen only according to past deeds and past experience. This Commission is to plan for the future, which will mainly concern the young doctors of to-day, and even if at present "they are doing something more urgent and more important" steps could be taken to present their written evidence to the Commission obtained from many quarters.

The seer foretold that the old men should dream dreams but it was the young men who should see visions. There seems a danger to-day that the old men, who admittedly have the experience of past things, think that this carries with it the ability to see visions for the future. This does not follow. It is surprising how, as we grow older, we lose touch with the thoughts and aspirations of the succeeding generation. I and many of my age are old enough to know something of the difficulties and pitfalls of general practice, but we are also young enough to remould our medical lives on an enlightened plan, and have time in which to carry the plan into action if allowed to do so. The gulf between youth and age is partly due to youth thinking all old folk are out of date, but this attitude has been largely brought about by age seeing all youth as rash, unschooled, and foolhardy, and shutting all but the hoary hairs out of their inner counsels.

If the findings of the Commission are to receive the welcome reception of the profession as a whole and young men in particular, it would be well to see that the gulf between age and youth among its personnel is closed, and that ample inclusion is made of those who have the ideas and the time and vigour to see them carried into effect.—I am, etc.,

London, S.W.17, March 23. E. GERARD HOUSDEN.

SIR,—Dr. Alfred Cox's letter in regard to the Medical Planning Commission (March 15, p. 419) contains the naïve statement that "young doctors . . . are engaged on something even more important and more urgent." Surely the great majority of all active members of the profession are today engaged in the whole-time pursuit of their task to help the community to a successful conclusion of this war. Perhaps Dr. Cox, with tongue in cheek, thinks that that is precisely the fitting circumstance in which to take the profession's name in vain. Will the young men be grateful to the Commission for its haste to arrange the future in their absence? How very satisfying it is for those of us too old to be engaged in "*something more urgent*" that we should occupy ourselves with the *young men's* business!—I am, etc.,

London, S.E.24, March 15. KENNETH MCFADYEAN.

Malignant Measles?

SIR,—In reply to the correspondence on Dr. Audrey Baker's possible case of malignant measles (March 8, p. 380), I would like to mention a similar case I saw in January, 1940.

A boy aged 3½ years was admitted to hospital on January 17. He had a copious nasal discharge, loose cough, slight photophobia, and a temperature of 99.6°. On January 20 he developed a typical measles rash, and inquiry at the hospital from which he had been transferred revealed that several cases of measles had developed in the ward he left on January 17. On January 21 a severe purpuric rash appeared in the napkin area. The purpuric spots were thickly distributed and by the evening they formed solid blue-black ecchymoses on the buttocks and thighs. Small discrete purpuric spots became generalized over the whole body and on the uvula and fauces. The child's condition deteriorated rapidly, he looked extremely toxic and pale, the pulse was impalpable, and the heart rate rose to 160. Finally signs of bronchopneumonia developed at the right base, and the child died at 11 a.m. on January 23.

The chief findings at the post-mortem examination were a terminal bronchopneumonia and signs of extreme toxaemia. There was no haemorrhage into the suprarenals, but there was a considerable area of haemorrhage in the tissues round the lower pole of the right kidney.

I diagnosed this case as malignant measles.—I am, etc.,

Hereford, March 27. M. E. WARD.

Public Health Service

SIR,—If one may judge by the extensive correspondence you have had on the Medical Planning Commission, there must be something far wrong with the present-day practice of medicine in this country. One writer suggests that we look back and see where we have taken the wrong turning. In my opinion we do not have very far to look; and I think I am confirmed in my view in reading the other day in the *Times Literary Supplement* a review of *Practical Public Health*

Problems, by Sir William Savage, a very distinguished worker in the field of hygiene whose writings must be read with respect. The reviewer states:

> "He speaks of himself as an 'old-timer bred in the old tradition' in spite of 'a prolonged schooling along more modern lines.' Not so long ago the duties of a Medical Officer of Health were confined to matters of preventive medicine and collective hygiene. In the course of the last two decades he has become 'enmeshed—*malgré lui-même*—in institutional provision for the treatment of his failures in preventive medicine. In consequence he tends more and more to take less and less interest in those specialized problems of environmental hygiene which occupied so much of the energies of his predecessors.' The field is thus left to the engineer and the sanitary inspector. Yet the problems raised are not purely engineering but have important health aspects which require the help of the scientifically trained medical expert. In his book Sir William Savage deals with this no-man's land between the functions of the M.O.H. and those of the sanitary inspector and engineer. The appearance and development of such a no-man's land show that unification, no less than co-ordination, has its dangers. Between personal medicine and collective preventive sanitation there is a fairly clear line of demarcation. That the two branches of hygiene should be brought and kept in touch with one another is in the highest degree desirable. Yet there seems to be good practical reason for basic departmentalism."

I think this warning is very much needed at the present time. If we glance at the history of the evolution of the present-day M.O.H. we find that he was originally an expert in sanitation and epidemiology, held in high respect by his colleagues in other branches of medicine. His successors have become regular Pooh-bahs: school medical officers (with no special training—six months house appointment is adequate for officering a post as an assistant school medical officer); chief tuberculosis medical officers (with no training in tuberculosis, but that ignorance covered up by the appointment of a "clinical tuberculosis officer"); chief venereal disease officer (again with a "clinical V.D. officer"), chief of maternity and child welfare clinics (divorced from the actual practice of obstetrics); directors of our hospitals (general, mental, and all the rest); and, last, administrators of our emergency war hospitals. His present state can be summed up as a jack-of-all-trades and master of none.

Now, Sir, are we to hand over the administration of all our professional activities to such an officer? If so, many of us will not regret our retirement. I would suggest that the M.O.H. is not a fit and proper person to be raised to this eminence in the profession. He has neither the training nor the experience nor the necessary professional status. In fact, I question if any medical man has all the necessary qualifications, and I would suggest that the M.O.H. be relegated to his proper sphere as a specialist in collective hygiene, and that his advisory functions to local authorities be handed over to a professional body embracing all branches of the profession practising in the district (medical, surgical, obstetrical, and laboratory). We have the germ of the idea in our Local Medical and Panel Committees.

In overhauling the M.O.H.'s department, attention is required to the various clinics that have grown up with him. Instead of our tuberculosis dispensaries, school, child welfare, and maternity clinics staffed by cheap "specialists," let us have real specialists of consultant status. What practitioner in his senses would send a patient to any of these clinics—with a few notable exceptions—say, when a university-allied hospital was available?

This is too big a question to consider in a letter such as this, but I might add that I have been informed that the abolition of the M.O.H. in his present state has been mooted in higher administrative circles, and also that the redistribution of our administrative areas is considered to be long overdue—that the present artificial county boundaries should be replaced by a regrouping around their natural centres, the cities and towns. Something of this sort is essential before we can get very far with any medical planning.—I am, etc.,

Galashiels, March 18 KENNETH MCLAY, M.D., D.P.H.

Village Settlements for the Tuberculous

SIR,—Dr. T. Francis Jarman writes (March 1, p. 335): "That a nation-wide need exists for workshops and factories where workers with arrested tuberculous lesions can be employed under special conditions and under medical care, no one working in anti-tuberculosis schemes can deny." This I ascertained to be true several years ago from the replies I received from many tuberculosis medical officers and superintendents of sanatoria to a questionary which was published in a report I was asked to make for the former Labour Party Advisory Committee (Public Health).

During the period I was tuberculosis medical officer I was mainly responsible for the foundation and administration of the late Efford Tuberculosis Colony (Plymouth) for ex-Service civilians and pensioners, and experience there taught me that the Government was *not* prepared "deliberately to foster and encourage the initiation of schemes of this kind." There is little reason to believe that the Government will do so *now*. On the contrary, this "colony," under the patronage of Prince George and members of the public health committee (Plymouth), though well situated and housed, received no financial support from the Ministry of Health or borough council, and it had to close down after a struggle for existence for ten or twelve years. It was conducted on the lines of the Papworth Village Settlement, with which and with whose founder I was personally acquainted, and to which I sent many patients. I attribute this failure mainly to the "restrictive influences of the profit system on medical economics" and partly to a belief that it was an "experimental" scheme.

At that time I visited the medical institutions of the U.S.S.R., and I found on inquiry that only "night sanatoria" for the tuberculous were included in their after-care schemes of "labour prophylactoria," and it is good news to hear from Dr. Jarman that the principles and practice of the late Sir Pendrill Varrier-Jones are now included in these schemes within the organization of the medical service of the U.S.S.R. In any case we should all work for a new world order, incomparably superior to the Nazi one, which would include such settlements within a complete, unified, efficient, and non-bureaucratic medical service on a national basis. I may say that the same fate as that of "Efford Colony" befell the "Laira Hostel (Plymouth) for Children" (who were "home contacts" with cases of active tuberculosis) after five years' struggle on a voluntary basis.—I am, etc.,

F. G. BUSHNELL, M.D., D.P.H.,
Vice-President and Life Governor, Devon and Cornwall Sanatorium.

Nurse Anaesthetists

SIR,—It is to be hoped that Mr. Loughnane's experience (March 22, p. 463) regarding anaesthetists' attendance at hospital is unusual; so far as my experience of teaching hospitals is concerned it is not only unusual but unique. If, however, his unhappy lot is a common one among operating surgeons, surely the proper remedy is not nurse anaesthetists but more competent qualified anaesthetists and better arrangements to regulate their attendance.—I am, etc.,

London, W.1, March 24. J. BLOMFIELD.

The March issue of *Industrial Welfare and Personnel Management*, the journal of the Industrial Welfare Society, contains an article on "The Rhythm of Work and Rest" by Dr. W. M. Burbury, who writes: "A great deal has been done recently in providing recreation during the working period, concerts at the lunch break, or music in the workroom. These things are very good in themselves, but they are not necessarily good for all workers. It depends on the type of person. Even in these recreative outlets there must be variety in order to avoid monotony: radio for half an hour, freedom to talk for another half-hour, and different kinds of relaxation from day to day." Dr. Burbury discusses the disturbances in the rhythm of our lives brought about by the war. Another article, on "Industrial Catering in Bombed Areas," records the experiences of a Coventry works canteen. Dr. John P. Steel, medical superintendent of the Smithdown Road Hospital, Liverpool, gives a very favourable account of the use of pure cod-liver oil (which is rich in vitamin A and D content) for the dressing of burns and wounds. He insists that only a medicinal oil should be used, and it should be pure, sweet, and fresh, just as it exists in the liver of the live fish: the word "crude" has led to misunderstanding and disfavour.

Obituary

SIR WILLIAM SMYLY, M.D., F.R.C.P.I., F.R.C.S.I., HON. F.R.C.O.G.

Sir William Smyly was born at 13, Merrion Square, Dublin, on November 14, 1850. He was the third son of Josiah Smyly, M.D., and Ellen his wife, who was the founder of Smyly's Homes and Schools for necessitous children. His elder brother, Sir Philip Smyly, was a celebrated surgeon, who was Surgeon-in-Ordinary to the Queen in Ireland. Smyly married Eleanor Colpoise, younger daughter of Henry Tweedy, M.D., thus increasing his connexion with the medical profession. They had two sons and four daughters: one son died in early life; the other, after a distinguished career at Trinity College, went to China, where he is engaged in medical missionary work. Of the daughters, one married her cousin, Sir Philip Crampton Smyly, late Chief Justice of the Gold Coast; the second married Dr. Hobhouse of London; the others remained unmarried, and were devoted to their father.

Smyly was educated at home and at Trinity College. Later on he studied in the clinics of Vienna and other cities on the Continent. After qualification he decided to specialize in obstetrics and gynaecology, and became assistant master at the Rotunda Hospital. In November, 1889, he became Master of the Rotunda, at a time when the fortunes of the hospital were at rather a low ebb; but soon the tide turned. From the first he showed indomitable energy: there was neither excitement nor fuss about this energy; "the dear little man," as some of his patients called him, pursued his object until it was accomplished. Gynaecological surgery was in its infancy, and he immediately took steps to ensure that the promising infant should be looked after. His first act as Master was to collect funds to build a wing for gynaecological patients. As the result of much enthusiasm on his part and that of his wife in raising money, and through the generosity of friends, the "Cairnes" gynaecological wing was completed, and soon aseptic gynaecological surgery was in full swing at the Rotunda. The theatre was small and, according to modern standards, poorly equipped. It was the first theatre in any obstetrical hospital and was far in advance of its time; an original device in its design was a glass screen *separating the onlookers from the operating* table. Much excellent work was done here when mortality was high elsewhere.

Smyly was an inspiring teacher, and postgraduates from all parts of the world flocked to the hospital. Needless to say, obstetrics was retained as the prime study. I have been able to trace the reports of the Rotunda for four years of his Mastership: his results were good, in spite of the fact that there were ten cases of sepsis in his first year; he overcame this outbreak so well that he had no mortality from this cause in the subsequent two years. His chief method of dealing with the epidemic was *the prevention of vaginal examinations*. I believe he was the first to show the value of morphine in eclampsia. "No meddlesome midwifery" was his watchword; and it is interesting to realize that in the diminutive labour ward, *with its concrete floor*, the results were at least as good as those obtained in the modern labour wards; and it must be remembered there were no gloves, no masks, no shaving, but there was great supervision: and cleanliness and natural labour were the key words. He introduced trained maternity nurses instead of untrained midwives into Ireland. There had been no night nurses, and the midwives used to sleep at night, sometimes in bed with the patients. He used to say: "If you give me a good nurse, I can train her into a good midwife, but I cannot train a midwife into a good nurse." Among other interesting innovations was the introduction of vegetables into the diet of the nursing mother.

When Smyly had completed his period at the Rotunda he became gynaecologist at the Adelaide Hospital, where he was highly successful both as an operator and as a teacher. Personally he was a beloved physician, and had an extensive private practice. He was a first-rate raconteur, and it was a delight to sit next to him at a dinner. His family life was ideal; he was devoutly religious, and served on the committees of many charities devoted to religious objects. He represented the Dublin Diocese of the General Synod of the Church of Ireland, and was associated with numerous nursing societies, Boys' Brigade, etc. The Masonic Order has lost in him a valuable Brother. For many years he was the Senior Grand Warden in the Grand Lodge of Ireland. In his youth he was a violinist and played a good deal of chamber music.

He contributed largely to obstetrical and gynaecological literature, and attended the Royal Academy of Medicine until comparatively recently. He had many honours conferred on him. He received his Knighthood in 1905. He was a past President of the Royal College of Physicians in Ireland; of the obstetrical section of the Royal Society of Medicine; of the Royal Academy of Medicine in Ireland; and of the British Medical Association. He received the Honorary Fellowship of many colleges and learned societies, including the Royal College of Obstetricians and Gynaecologists, the Royal Academy of Medicine in Ireland, the Edinburgh and Leipzig Obstetrical Societies.

Although he had attained the great age of 90, we saw him until quite recently at the reunions at the Rotunda and at the Royal College of Physicians, where he was still his cheery smiling self. Sir William Smyly was an example to the young and to the old; a pleasant companion; an honest and knowledgeable physician always more than alive to the necessity for the observation of strict ethics. He lived his span and lived it well. We extend our sympathy to his family, who, like ourselves, will surely miss him.

B. S.

W. D. DONNAN, M.D.

We regret to announce the death on March 17 of Dr. William Dunlop Donnan of Holywood in his seventy-second year. The son of William Donnan of Holywood, Co. Down, he was born in Colombo while his parents were in Ceylon. He was one of a distinguished family, and his younger brother, Prof. F. G. Donnan, was the pupil and successor of Sir William Ramsay at University College, London. Dr. Donnan was educated at Queen's College, Belfast, and graduated in the Royal University of Ireland in 1893. In 1898 he was awarded the much-coveted gold medal of the Royal University when he obtained his M.D. He was a lifelong member of the British Medical Association and a Fellow and past-president of the Ulster Medical Society.

Donnan began practice in Holywood more than fifty years ago. There he became medical officer of Castlereagh No. 2 Dispensary, A.R.P. medical officer for Holywood, and police surgeon. The writer of this memoir has many happy recollections of his residence in the old Royal Victoria Hospital at the time when Dr. Donnan was house-physician and house-surgeon. He owes much to his friendship and to his early instruction in clinical medicine. During Donnan's first years in practice he was an ardent laboratory worker, and from Lorrain Smith's laboratory he and the late Dr. James Colville published in the *British Medical Journal* in 1898 the first paper from Ulster on the Widal reaction. He maintained his interest in this type of work, as some of his more recent publications and papers show. By all who knew him Donnan was rightly regarded as a man of outstanding ability and great promise, and it was with some misgivings that his friends learned of his decision to do his life work as a country practitioner in his native town of Holywood. When, however, his fifty years of active practice are rightly assessed there can be no regret at this decision. He brought to bear on his extensive practice untiring energy, great judgment, and a thorough knowledge of medicine: all his work was good work well done, and there are many in the Holywood district who have reason to regret his death and revere his memory. He leaves a widow and two sons, who are both in practice in Holywood; to them we offer our sincere sympathy.

The Services

Colonel S. W. Kyle, retired, late R.A.M.C., has been appointed a Deputy Director of Medical Services, and has been granted the acting rank of Major-General.

ARMY AWARD

The D.S.O. has been awarded to Lieut. James Morton Muir, R.A.M.C., in recognition of gallant and distinguished services in the field. The published announcement of the award said: "During the battle of Sidi Barrani in December he was severely wounded in the shoulder and pelvis by splinters of a shell which hit the regimental aid post vehicle. He insisted on being propped up beside his vehicle, refusing an injection of morphine so that his senses might remain clear. Though suffering intense pain he continued for approximately eight hours to give directions on the care of the wounded as they were brought in until loss of blood made it impossible for him to remain sitting. He was laid down, but continued to give directions and advice until the last wounded man had been evacuated, and only then did he consent to be placed in the ambulance. His devotion to duty undoubtedly saved many lives and was a tremendous inspiration to the personnel of the post and to the wounded men."

CASUALTIES IN THE MEDICAL SERVICES

Royal Navy

Surgeon Lieut. JOHN FFRANGCON ROBERTS, R.N.V.R., the elder son of Dr. and Mrs. Ffrangcon Roberts of Histon, Cambs, is reported missing, believed killed, in the Middle East last month. He was 25 years of age, and received his medical education at the London Hospital, qualifying M.R.C.S., L.R.C.P. in 1939. He had held the posts of resident anaesthetist and receiving-room officer at the London Hospital and resident medical officer at an E.M.S. hospital.

Probationary Temporary Surgeon Lieut. WILLIAM GRAHAM CUTHBERTSON, R.N.V.R., is included as "Killed" in an Admiralty casualty list published on March 24. He was 24 years of age, and was educated at Annan Academy, Stewart's College, Edinburgh, and the University of Edinburgh, where he graduated M.B., Ch.B. in 1939. He held a house post at St. Luke's Hospital, Bradford, before joining the R.N.V.R. in April, 1940. He saw service along the Libyan coast and was present at the action at Taranto.

Royal Army Medical Corps

Lieut. DONALD ALFRED BIRD was killed in France on June 18, 1940. He was born in Canada in 1914, took the Scottish triple qualification in 1939, and joined the British Medical Association in the following year.

Wounded

Captain Victor James Keating.
Lieut. Alexander Wilson Forbes Catto.

DEATHS IN THE SERVICES

Surgeon Captain EDWARD JOHN MORLEY, R.N. (ret.), died at Bournemouth on March 13. He received his medical education at Guy's Hospital, and took the L.R.C.P. in 1878, the M.R.C.S. in 1879, and the F.R.C.S. in 1891. Entering the Royal Navy soon after qualifying, he attained the rank of fleet surgeon in 1899 and of surgeon captain in 1910. He served in the war of 1914–18, receiving the medals.

Colonel THOMAS HENRY MATTHEWS CLARKE, C.M.G., C.B.E., D.S.O., late R.A.M.C., died at Rathfarnham, Co. Dublin, on March 4, aged 71. He was born on June 15, 1869, at Nassau, in the Bahamas, the only son of Staff Surgeon T. M. Clarke, A.M.D., who died there soon afterwards. He was educated at Trinity College, Dublin, where he graduated M.B., B.Ch., B.A.O. in 1895. Entering the Army as surgeon lieutenant in 1897, he became lieutenant-colonel in 1915, colonel in 1918, and retired in 1920. He served in the action at Kandia, Crete, on September 6, 1898, when he was wounded, and was mentioned in dispatches in 1899, receiving the D.S.O. From 1900 to 1903 he was Personal Physician to Prince George of Greece. He was seconded for special service under the High Commissioner for Crete from 1901 to 1903, and for his services received the C.M.G. in 1903 and was appointed a Knight of the Order of the Saviour of Greece. In 1912 he became physician and surgeon to the Royal Hospital at Kilmainham, a post which he held until the war of 1914–18. During that war he served in France and Flanders, was mentioned in dispatches, and received the C.B.E. He was the author of an article on sanitary work in Crete, and contributed a paper on prehistoric sanitation in Crete to the *British Medical Journal* in 1903. He had been a member of the British Medical Association for forty years.

Lieut.-Colonel HENRY WARWICK ILLIUS, C.I.E., I.M.S. (ret.), died at Funchal, Madeira, on February 13, aged 65. He was born at Bahia, Brazil, on October 9, 1875, received his medical education at St. Bartholomew's Hospital, and took the M.R.C.S., L.R.C.P. in 1900 and the F.R.C.S.Ed. in 1906. Entering the I.M.S. as lieutenant in 1901, he became lieutenant-colonel in 1920, and retired in 1930. Most of his service was passed in civil employ in the United Provinces, where he was on plague duty from 1907 to 1909, when he obtained a civil surgeoncy and held civil appointments until his retirement, except that from 1914 to 1921 he was on military duty. He served on the North-West Frontier of India in the Waziristan Campaign of 1901–2 (medal with clasp); in the Tibet War of 1903–4 (medal with clasp); and in the war of 1914–18. in Iraq in 1920–1, when he was twice mentioned in dispatches and received the C.I.E. He was a brother of Lieut.-Colonel J. W. Illius, I.M.S. (ret.). He had been a member of the British Medical Association for thirty-seven years.

Lieut.-Colonel HAROLD EDGAR PRIESTLEY, C.M.G., R.A.M.C. (ret.), died at Yateley, Hants, on March 16, aged 62. He was born on January 24, 1879, received his medical education at St. George's Hospital, and took the M.R.C.S., L.R.C.P. in 1905. Entering the R.A.M.C. as lieutenant in 1905, he became major in 1915, lieutenant-colonel in 1930, was placed on half-pay on account of ill-health in 1932, and on the retired list later the same year. He served in the war of 1914–18, was mentioned in dispatches in 1918, and received the C.M.G. for his services in the typhus epidemic at Wittenberg during that war, when some 15,000 British prisoners of war were confined in a camp of some ten and a half acres at Wittenberg and were insufficiently clothed and half-starved. Typhus broke out in the camp, the German medical staff refused to attend the patients, and all communication with the camp was cut off, food being sent in by trolley and orders shouted from outside. Six R.A.M.C. officers volunteered to attend the men, and three of the six died of typhus. Major Priestley survived, but his health was permanently affected, though he put in a further fifteen years' service. Among appointments which he held later were those of medical officer of the Duke of York's Military School at Dover and medical officer of the Royal Military Academy at Woolwich.

Universities and Colleges

UNIVERSITY OF BIRMINGHAM

Lectures in Industrial Medicine

A course of six lectures in industrial medicine for medical officers appointed to factories will be held in the Medical School on Saturday and Sunday, April 19 and 20. The course will be open also to all members of the medical profession interested in the subject. Further particulars may be obtained on application to the Dean of the Faculty of Medicine, the Medical School, Birmingham, 15.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

FINAL M.B., CH.B.—*Part I:* [1]D. Annis, A. Ansell, E. R. Banner, [1]Beryl R. Bentley, [1]Margaret J. Blackburn, K. W. Boggis, H. O. M. Bryant, E. Burman, [1]E. F. B. Cadman, [2]Eva V. Cooper, K. H. Dalrymple, A. S. Davidson G. Davies, [1]J. N. Dearnaley, J. F. Doherty, K. E. Donnellan, Ann Donnelly, I. H. Foy, H. Francis, H. G. Frank, [1]H. Friend, [1]S. M. Green F. D. Griffiths, Elizabeth M. Harper, A. Jolleys, Eirwen M. Jones, [1]S. E. Keidan, [1]H. Lewis, I. P. Madhok, Margaret L. Magee, A. W. Merrick, A. F. Murphy, [1]R. C. Nairn, K. H. Oldfield, C. Pownall, N. E. Raybould, R. L. B. Roberts, A. J. Robertson, P. L. Robinson, M. J. R. Ryan, Betty Schofield, E. Scott, E. R. Shepherd, K. H. Slatter, H. O. Williams, [1]Margaret Woolfenden. *Passed in Individual Subjects:* Mary A. R. Allan (Pharmacology and General Therapeutics). *Part II:* E. H. Annels, A. S. Beadel, J. J. Bligh, [1]S. Bradshaw, Hilda E. Bullen, E. R. Carter, W. P. Clothier, V. L. Cooper, H. V. Cross, J. G. K. Dean, P. J. Devlin, Jean M. Frazer, K. C. Fulton, Patricia F. M. B. Gould, Joan O. Grant [1]T. C. Highton, M. Horwich, R. D. Holston, H. P. Hughes, F. A. H. Inman, W. B. E. Jones, J. J. Lieben, J. Littler, M. L. P. Lyons, Jane C. S. Maclachlan, [1]L. Mandel, A. J. Marsden, R. H. Martin, R. H. Maudsley, Betty W. Morris, P. D. Moss, J. C. B. Murphy, S. P. C. O'Reagain, C. Pownall, G. J. Rees, Hilda M. Reese, G. C. Roberts, C. D. Rosenwald, D. I. Rowlands, J. M. G. Sarsen, T. L. Schofield, Irene W. Simpson, R. V. Tracy Forster, Anabel M.

urner, D. C. Watson, R. H. Watts, G. A. Wetherell, D. W. Wilson, H. S. L. Young, [2]Rosalind Zalin.

DIPLOMA IN TROPICAL MEDICINE.—P. Austin, P. R. Cooper, I. K. Menon, L. Merrill, G. Prasad, W. B. Young.

[1] Distinction in pharmacology and general therapeutics. [2] Distinction in pathology and bacteriology. [3] Distinction in public health. [4] Distinction in forensic medicine and toxicology

UNIVERSITY OF SHEFFIELD

The following candidates have been approved at the examinations indicated:

M.D.—M. B. Brody.

FINAL M.B., CH.B.—*Parts II and III*: *E. H. Jones, *M. Laird, J. H. Foggitt, P. S. D. Gowers, J. D. Hopewell, J. R. Horn, N. R. Marshman, Joan Pattison, F. Rudnicki, C. H. B. Sparrow, P. Turner.

* With second-class honours.

UNIVERSITY OF EDINBURGH

At the meeting of the University Court on March 24, with the Principal, Sir Thomas Holland, in the chair, regulations for the Whaitt Research Scholarship Fund were adopted on the recommendation of the Senatus. The free income of the fund is to be used to provide one or more research scholarships in some branch of medicine to be chosen from time to time by the University Court on the recommendation of the Faculty of Medicine and the Senatus. The subject, conditions of award, amount and duration of each scholarship will be advertised beforehand. Graduates in any faculty of the University or of other approved universities, or licentiates of approved colleges, will be eligible for the award of a scholarship.

UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

The following candidates have been approved at the examinations indicated:

M.D.—G. J. Dixon, R. T. Jackson, P. A. McNally.

FINAL MEDICAL EXAMINATION.—*Medicine, M.B.*: [2]B. W. Wyllie, [2]E. D. Kerr, [2]Alicia G. Pike, M. E. Weiner, W. G. D. Caldwell, A. F. Crowley, H. H. Robinson, J. R. Healy, H. B. C. Houston, W. J. Thompson, I. Shribman. *Surgery, B.Ch.*: M. A. Majekodunmi, J. L. Handelman, Kathleen M. Patterson, N. H. Stewart, A. H. H. Guilbride, L. C. Jacobson, S. Smullen, A. F. Crowley, C. D. MacCarthy. *Midwifery, B.A.O.*: [1]G. B. Gibson, [1]Elizabeth D. L. Simpson, [2]S. T. McCollum, [2]G. S. Prince, [2]Maude F. P. Bigger, [2]Emmeline P. Crowe, [2]Kathleen M. J. Morphy, [2]P. C. Smyly, [2]Margaret F. Y. Dixon, [2]J. B. Dunlop, [2]J. R. Hassard, [2]M. J. M. Solomons, J. P. Hearne, J. P. Walsh, Helen S. Watson, T. A. H. Black, C. R. Griffin, Ivy K. Bayne, Ethna M. MacCarthy, L. H. Shrago, Gladys M. Byers, L. H. Citron, A. C. MacA. Hobson, G. F. Shaw, B. Kernoff, A. McC. Russell, R. O. D. Reid, J. N. Greene, T. L. Kelly, A. G. Lee, Dorthy H. Wester, C. E. Williams, A. C. McReynolds, T. J. N. Bates, H. Lesselbaum, C. W. Lloyd, A. R. B. Jackson, D. J. Naughton.

D.P.H.—*Part I*: [1]W. Hayes, [2]F. W. Crook

[1] With first-class honours. [2] With second-class honours.

Medical Notes in Parliament

Adjustment of Financial Liabilities due to War

Moving in the House of Lords, on March 25, the second reading of the Liabilities (Wartime Adjustment) Bill, Viscount SIMON said that owing to the shifting of population a large number of people who before the war carried on the professions in the ordinary way had been put into extreme financial difficulty. The Bill applied to "any person who is in serious financial difficulties owing to war circumstances." That person might be a professional man whose clients or whose patients had moved elsewhere. The Courts (Emergency Powers) Act would in proper cases prevent the imposition of damages or distress for rent, but under it the debtor saw piling up over his head a mountain of obligations. To make him go through the Bankruptcy Court was inappropriate. The Bill provided machinery for bringing together the debtor and his creditors for the purpose of seeing, with the help of a liabilities adjustment officer, whether an arrangement could be reached to the benefit of both debtor and creditors. If all agreed a scheme would become operative at once. If a majority agreed the adjustment officer could approve a scheme, but a minority creditor could secure a review of the matter by a county court judge. There would always be priority for one year's taxes and for debt in the nature of wages. In cases where the adjustment officer had not produced agreement the county court could be invited by the debtor or by any creditor to devise a liabilities adjustment arrangement. The home and furniture of a debtor and the tools of his trade would be exempted from the property to be realized. In exercising its powers the court would have regard to the prospects of the business.

The Bill was read a second time

State Medical Service

Mr. LYONS asked on March 26 whether Mr. Ernest Brown would consider as an early post-war scheme of reconstruction the establishment of a complete State Medical Service incorporating clinical, specialist, and scientific facilities in a nation-wide proposal of general application. Miss HORSBRUGH replied that the importance of the facilities to which Mr. Lyons referred would not be overlooked, but Mr. Brown was not in a position to make a statement at present as to the form in which such facilities could most suitably be provided.

Gas Warfare

Replying on March 27 to Mr. Simmonds, Mr. HERBERT MORRISON said this country would in no circumstances be the first to employ gas. The civilian gas mask, when properly used, gave full protection against any known war gas. The Government was taking fresh steps to ensure that every member of the population carried, practised with, and was in every respect familiar with his gas mask. Exercises and propaganda would be employed to this end. With proper measures of protection such as were now available to the population there was no ground for serious alarm about the effect of gas attack, provided always that proper precautions were taken and that the public obeyed the advice given to it. Mr. Morrison added that it was not considered necessary to make a general issue of eye-shields to the public at large.

Annual Report of Ministry of Health: Wartime Cessation

Asked by Mr. Rhys Davies on March 27 when the annual report of the Ministry of Health for 1939–40 would be published, Mr. ERNEST BROWN said he regretted that in view of the work involved, the pressure under which the staffs of the Ministry and of local authorities worked, the shortage of paper, and other difficulties, it would not be practicable to continue the publication of annual reports during the war. Following the practice adopted in the war of 1914–18, material was, so far as circumstances permitted, being collected for publication in a composite report after the end of the war. He would look into the possibility of giving a summary.

Registration of Alien Doctors

Sir HENRY MORRIS-JONES suggested on March 27 that the arrangements for allowing alien allied doctors in this country to help in the joint cause by becoming temporarily registered medical practitioners were slow and unsatisfactory. Mr. BROWN answered that the Central Medical War Committee, which acted as a clearing house for supplying alien doctors to hospitals and other authorities desiring to employ them, had received a large number of names from various sources. It would be glad to receive others from the Allied Governments concerned, with some of which it was already in touch. The procedure took some time to set in motion, including as it did the steps necessary for registration with the General Medical Council and for satisfying the general requirements relating to aliens. It was now working smoothly.

Replacement of Civilian Medical Practitioners by R.A.M.C.

On April 1 Captain MARGESSON, in reply to Miss Ward, who asked for an assurance that no action would be taken against civilians reporting on conditions in the Auxiliary Territorial Service through parliamentary channels, said he was assured that Miss Ward was referring to a misunderstanding which arose out of a long-standing decision to replace civilians by R.A.M.C. women doctors, where available, on the panels formed to examine A.T.S. recruits. Notice of the

termination of their appointments was sent simultaneously to all the civilian members concerned, and there was therefore no question of discrimination against an individual.

Replying to a further question by Miss Ward, Captain Margesson said that the decision to replace civilians by R.A.M.C. personnel was taken partly because the method of payment of civilian doctors was unsatisfactory and partly to economize in medical personnel.

Fatigue in Factory Workers.—Answering Mr. Rhys Davies, Mr. ERNEST BEVIN said on March 13 that factory employers were encouraged, as a part of their arrangements for proper supervision in the interests of health and efficiency, to keep records of sickness and absenteeism which might afford indications of excessive fatigue or of something else amiss in a factory or in a particular department of it. It would not usually be possible without close inquiry at the particular factory, which would primarily be a matter for the management, to ascertain how far any evident fatigue or ill-health or accidents were attributable to speed of working as distinct from long hours and other factors. The importance of optimum rates of work from the point of view both of efficiency and of accident prevention was stressed in the Industrial Health Research Board Report on Industrial Health in War, which received wide publicity, as well as in other publications.

Home Guard Casualties.—Mr. ERNEST BROWN stated on March 25 that the air-raid precautions services are to cater for casualties among the Home Guard as they do for civilian casualties. The decision is being made known by his Regional Officers to local authorities concerned. He added that there was no need to establish additional first-aid facilities to meet the needs of Home Guard units. Arrangements for augmenting, if necessary, the personnel attached to existing first-aid posts and for paying the necessary remuneration were being made known by Regional Officers to the local authorities.

Procedure for Recruitment of Doctors.—Mr. BROWN told Mr. Groves on March 25 that the procedure adopted by the Central Medical War Committee and the Local Medical War Committees in selecting doctors for recruitment to the Forces provided for a full investigation in each case of the needs of civilian practice. The local committee invited representations both from the doctor himself and from interested parties, such as his partners, or, if he was an assistant, his principal, a hospital or any public authority by which he was employed, and, if he was an insurance practitioner, the Insurance Committee. These recommendations were fully considered, and if so desired were made orally. If the local committee recommended recruitment, objecting parties might make representations to the central committee in the same way.

Shortage of Mental Hospital Nurses.—On March 27 Mr. Brown was asked by Mr. SORENSEN whether he was aware of an increasing serious shortage of male and female nurses in mental hospitals owing to their voluntary or compulsory transference to military or war work. Mr. BROWN said he knew that difficulties were in some cases being experienced in this as well as other services administered by local authorities. The matter was being kept under review in consultation with the Ministry of Labour and National Service. The Ministry of Health was in touch with the local authorities on it. In some districts this was a major problem.

Notes in Brief

Lord Woolton and Mr. Brown are consulting on the possibility of importing concentrated orange juice.

According to the latest information, 121 tuberculosis authorities out of 174 in England and Wales have made after-care arrangements. The number of new cases attending dispensaries is well maintained in urban areas, having regard to the effects of evacuation from those areas.

The weekly value of cash, clothing, food, and other allowances paid by the London County Council to their nursing staffs varies from £3 2s. 3d for probationers in training, non-resident, to £5 1s. 5d for sisters.

Arrangements for the rehabilitation of disabled ex-Service men under medical supervision are in operation by the Ministry of Health's Emergency Service and the Ministry of Pensions.

Arrangements for the fees payable for radiological examination and report on a Service out-patient to voluntary hospitals at which medical staffs are remunerated for Emergency Medical Service work on the occupied-bed basis are at present under revision.

In 1940 eight deaths were reported in the United States as directly due to the celebration of the Fourth of July with fireworks and other explosives. There were two cases of tetanus in 1940, of which both recovered, as compared with three in 1939 and two each in 1937 and 1938.

No. 10

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 8, 1941.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	(b)	(c)	(d)	(e)	1940 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	370	29	66	3	14	606	35	105	3	4
Deaths		1	6				5	17		
Diphtheria	1,015	50	298	24	39	662	41	232	42	33
Deaths	23	1	8	—	2	24	1	13	2	2
Dysentery	156	12	23		—	42	7	45		1
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	6	—	3		—	8	—	—		—
Deaths		1	—				—	2		
Enteric (typhoid and paratyphoid) fever	17	1	1	2	—	23	3	8	15	2
Deaths	1	—	—	—	—	3	—	—	—	—
Erysipelas			65	5	6			58	11	2
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years										
Deaths	33	6	10	3	1	31	8	11	6	6
Measles	15,424	287	171		6	4,888	80	108		226
Deaths	20	1	1	1	—	2	—	—	1	14
Ophthalmia neonatorum	70	3	16		—	90	8	23		1
Deaths										
Pneumonia, influenzal*	1,495	70	56	17	5	1,883	99	58	9	26
Deaths (from influenza)	199	13	15	6	10	429	28	23	15	30
Pneumonia, primary			571	16				374	18	
Deaths		—		13	19		75		18	26
Polio-encephalitis, acute	—	—				1	—			
Deaths		—								
Poliomyelitis, acute	3	—	1	1	—	5	2	—	—	—
Deaths		—	—				—	—		
Puerperal fever	—	—	9	2	—	5	5	14	3	—
Deaths		—					—			
Puerperal pyrexia	139	5	7		6	150	11	28		1
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,161	52	166	29	40	980	35	111	52	77
Deaths	4	—	—	—	—	2	—	1	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	2	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	3,617	45	822		17	519	17	23	1	16
Deaths	41	1	19	—	1	7	—	2		2
Deaths (0-1 year)	455	33	147	38	24	527	59	94	25	38
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	6,439	837	937	272	221	7,415	1,103	899	279	253
Annual death rate per 1,000 persons living			20.4	18.1	19.4			17.0	18.6	20.2
Live births	5,304	378	916	386	234	6,593	1,002	913	372	262
Annual rate per 1,000 persons living			18.5	25.6	20.5			18.5	24.8	23.0
Stillbirths	223	10	35			263	37	41		
Rate per 1,000 total births (including stillborn)			37					43		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The numbers of cases of measles and of whooping-cough have slightly increased during the week. Whooping-cough had the larger actual and relative increase, the increase being distributed generally over the whole country. The slight rise in the incidence of measles was mainly due to a few areas only. Middlesex had the largest increase, from 612 to 860 cases, but the most striking difference for the two weeks was seen in East Suffolk, where the notifications rose from 99 to 157. The figure for diphtheria differed by only one notification from last week's total. Scarlet fever, with 139 fewer cases than in the previous week, had the lowest number of cases recorded since the beginning of last July.

Cerebrospinal Fever

A drop in the number of cases notified in England and Wales was shown by the returns for the week ending March 8; this was followed by a further fall for the week ending March 15, but the returns for the 22nd showed a slight increase (eight cases) on the previous week. In the

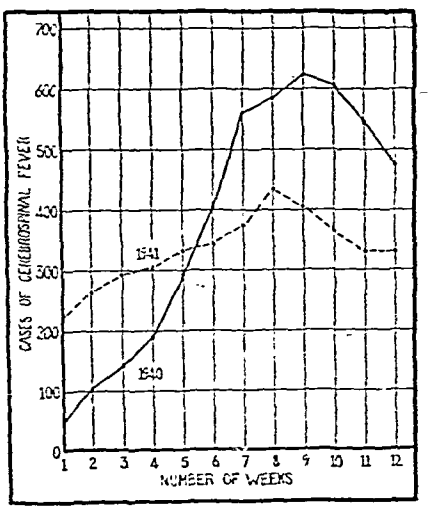


Chart showing incidence of cerebro-spinal fever in the first twelve weeks of 1940 and 1941

immediate pre-war year the weekly notifications for cerebro-spinal fever ranged from 10 to 50, with the greatest incidence in the first quarter; in 1938 and 1939 approximately one-third of the annual total was recorded in this quarter. The disease first increased to serious epidemic proportion in the second week of 1940, when 107 cases were returned as compared with 52 for the previous week. The weekly totals increased rapidly until a maximum of 623 cases was reached in the ninth week, and then slowly declined to a minimum of 107 notifications in the week ending September 7, 1940. The number of weekly cases increased slowly, and 229 cases were recorded in the first week of 1941, the beginning of the epidemic period. The rate of increase during the 1941 epidemic was very much less than in 1940, and so, despite the higher initial figure, the number of cases recorded in the sixth week was less than the number recorded in the sixth week of 1940. The trends of the two epidemics are illustrated in the chart. In Scotland the notifications have fallen from 97 to 66, a decrease of 33%.

Dysentery

A further fall has occurred in the number of notifications. All the 26 cases from Bedford were from Biggleswade R.D.; of the 15 cases in Essex, 10 were from Colchester M.B. and 5 from Brentwood; the 13 cases in Hertfordshire were all from Bushey U.D.; of the 27 cases from Lancaster, 8 occurred in Whiston R.D. and 6 in Lancaster M.B.; 9 of the 13 cases reported from Surrey came from Coulsdon and Purley U.D.; Goole M.B. accounted for 7 of the 13 cases in Yorkshire, West Riding. Of the 23 cases reported in Scotland, 8 were from Edinburgh.

Ophthalmia Neonatorum

Almost half of the cases reported in England and Wales were returned from two towns, Liverpool 13 and Birmingham 18. Eleven, almost three-quarters, of the Scottish cases were from Glasgow.

Medical News

The Pharmaceutical Society of Great Britain will celebrate its centenary on Tuesday, April 15, by a Thanksgiving Service in St. Pancras Church, Euston Road, at 11 a.m., at which the address will be given by the Right Rev. Bishop H. Crotty, Vicar of St. Pancras, and by a commemoration meeting at the Conway Hall, Red Lion Square, W.C., at 2 p.m. that day. The Lord President of the Council, the Right Hon. Sir John Anderson, will speak.

The B.B.C. announces that on Sunday, April 13, at 6.45 p.m., a talk in the Home Service will be given on "One Hundred Years of Pharmacy," by Mr. Walter Deacon, president of the Pharmaceutical Society. This is in connexion with the centenary of the society. On April 30, at 1.30 p.m., it is hoped to include a broadcast from the Red Cross stamp sale.

The House and Library of the Royal Society of Medicine will be closed for Easter from Friday, April 11, to Monday, April 14, both dates inclusive.

The annual meeting of the Society for the Study of Inebriety will be held at the Medical Society of London, 11, Chandos Street, W., on Tuesday, April 8, at 4 p.m., when Dr. J. Y. Dent will open a discussion on "The Study and Treatment of Inebriety."

A discussion on vegetables as food has been organized by the nutrition panel of the Food Group of the Society of Chemical Industry, and it will be held at B.M.A. House, Tavistock Square, W.C., on Wednesday, April 9, from 11 a.m. to 4 p.m., with Sir E. J. Russell, F.R.S., in the chair. At the morning session Dr. M. A. Pyke will speak on the chemical composition of vegetable foods and their place in peacetime and wartime diets, Dr. H. V. Taylor on the planning of vegetable production, and Miss M. Olliver on the effect of cooking on the nutritive value of vegetables. After the luncheon interval Mr. W. B. Adam and Dr. Allen will deal with the effect of canning, and of drying and other forms of preservation, on the nutritive value of vegetables. Although no tickets are required, those attending as guests of the society come under the jurisdiction of the Ministry of Home Security with regard to publication of the proceedings.

University College Hospital has arranged, with the co-operation of the Watford Peace Memorial Hospital, as a war-time measure, to open consultative out-patient clinics there. The clinics are being held as follows at 2 p.m.: surgical clinic, Monday; medical clinic, Tuesday; gynaecological clinic, Thursday. The clinics are conducted by members of the staff of University College Hospital, and all new cases attending are required to present letters of recommendation from medical practitioners.

Wynne Mariette Stuart Campbell, aged 42, described as a secretary, who, in the name of Lady Campbell, was alleged to have posed both as a member of the Secret Service and as a surgeon commander in the Royal Navy, received a sentence of three months' imprisonment at Marlborough Street Police Court, London, on March 25. Arrested at Glasgow, she was accused under the Defence Regulations of doing an act calculated to suggest falsely that she was a surgeon commander R.N., and she was charged also under the Medical Act with falsely pretending to be a surgeon.

Dr. Roscoe W. Hall, clinical professor of psychiatry at George Washington University, has been elected president of the American Psychiatric Association.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be addressed to the Secretary.

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B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Tinct. Opii Acet.

DR. CATHERINE THOMAS writes: I shall be obliged if any reader will kindly let me know the formula for tinct. opii acetatis that was in *Neligan's Dublin Pharmacopoeia*.

Sjögren's Syndrome

DR. F. PARKES WEBER (London, W.) writes in reply to Dr. Margaret Colls (March 29, p. 500): The only English account under the above heading is by Dr. J. H. Sheldon (*Proc. roy. Soc. Med.*, 1938–9, **32**, 255). Dr. Colls does not mention the presence of kerato-conjunctivitis sicca, the feature which led Henrik Sjögren (an eye specialist in Stockholm) to make his series of communications on the subject in the *Acta Ophthalmologica*. Dr. W. Stahel, in St. Gallen, claims excellent results (*Helvetica Medica Acta*, 1938, **5**, 579) from three months' treatment with 16,000 biological units of vitamin A daily, but I have not heard that his results have been confirmed.

Conserve of Hips

MRS. DOROTHY D. STEWART, M.Sc. (Hampstead) writes: The following recipe is taken from *The Compleat Housewife*, dated 1739. The conserve prepared from hips by this method would retain the full amount of vitamin C, as no boiling is necessary during its preparation. Our ancestors seemed to realize the necessity for storing such products to be used during the late winter season.

"Gather the hips before they grow soft, cut off the heads and stalks, slit them in halves, and take out all the seed and white that is in them very clean, then put them in an earthen pan, and stir 'em every day, else they will grow mouldy; let them stand till they are soft enough to rub thro' a coarse hair sieve; as the pulp comes, take it off the sieve; they are a dry berry, and will require pains to rub it thro'; then add its weight in sugar, and mix it well without boiling, keeping it in deep gallipots for use."

Income Tax

Practice Carried On in Absence—Expenses

"LEASEHOLDER'S" practice has been carried on under the Emergency Scheme; can he still claim half annual value and rates? A ground rent is being paid for a house which has been destroyed: is this correct?

*** As regards the expenses, the answer depends on the particular facts. If the house is still being used professionally some deduction is due, but whether the half as before or not depends on what change (if any) there has been in the ratio of private to professional use. The authorities are not likely to want to drive a hard bargain in the circumstances. The liability to pay the ground rent (less income tax, of course) remains in spite of the destruction of the house; "Leaseholder" will presumably receive compensation under the proposals of the War Damage Bill, and the freeholder will be liable to bear some portion of the contributions to be levied under those proposals.

Fall in Earnings of Husband and Wife

"WIFE" explains that for 1940–1 her husband has been assessed for her salary of £500 per annum in addition to assessments of £219 and £274 for receipts from his own and her literary work. The latter items will be much reduced for 1940–1 as compared with the 1939–40 amounts on which the assessments are based.

*** There is no right of appeal at present, but if the total earnings for the actual year 1940–1 are less than 80% of the aggregate assessed (i.e., are less than £795) a reduction to the actual amount can be claimed. It is presumably for that reason that the inspector of taxes states that he can do nothing until the next return is made.

LETTERS, NOTES, ETC.

Garden Work for Convalescents

DR. SINCLAIR M. EVANS (Baslow, Bakewell) writes: In count districts we are being encouraged to dig for victory during t coming season. A good deal of extra work could be perform willingly by convalescent patients who are at present condemn to enforced idleness through the by-laws of their approv society. Surely the present state of emergency merits son relaxation of these rules at the discretion of the attendi practitioner.

Medical Woman-power

"X" writes: Knowledge that I am not the only unwanted doct gives me a small measure of consolation. Anticipating a ca upon my services I had planned my domestic arrangements s that I should be quite free to work outside my home—a difficu and expensive task these days. As I do not wish to cut myse adrift from my husband and small children I offered my servic through several channels for part- or whole-time work in m district even up to a radius of twenty miles. Apart from a sho locum and being a reserve medical officer at a small first-aid po I appear unwanted for the war effort. In this district there ar hospitals staffed by men of military age, practices are combine so that one man does the work of one or two absentees, and thi in a reception area. Retired men have returned to duties whic must be in some cases too arduous for them. There are man Service girls and, to the best of my belief, no medical woman i provided for them. Sex prejudice seems to be rife in som localities, where the medical woman is looked on as somethin out of place. Surely we are not expected to take the step back as Nazidom has, and bind ourselves to the household regardless of years spent in training and practice. I pause in my labour as cook-general to write this, as, alas! my staff have found thei services more in demand for work of national importance tha I have mine.

Calcium for Mucosal Ulcers

DR. J. SHACKLETON-BAILEY (Suffolk) writes: I have read wit interest Dr. Pappworth's article on cyclical mucosal ulceratio (February 22, p. 271), and also the recent articles on calcium absorption and metabolism. In relation to these subjects I should like to record a case of mine in which the mucosal ulcers immediately retrogress on administration of "ostocalcium" tablets. This patient, aged 60, had been troubled by the condition for about thirty years in spite of a variety of treatments prescribed by practitioners and consultants. Prior to the menopause a new crop of ulcers occurred just before each menstrual flow. Since then, I believe, their appearance has been quite irregular.

Induced Hyperaemia with Sulphanilamide in Paronychia

DR. H. G. LANGDALE-SMITH (Tarrington) writes: In the last few months paronychia has been prevalent. Although sulphanilamide applied locally and by the mouth did not appear to have much effect, it was found that by inducing hyperaemia by Bier's method to the affected limb at intervals of two, four, and six hours after the administration of 1 to 5 grammes of sulphanilamide by the mouth good results were obtained. Presumably the concentration of sulphanilamide was greater in the congested area than in the rest of the circulation. During the administration of sulphanilamide it is usual to exclude salts as well as eggs and onions, on the assumption that they contain sulphur. It seems, however, unlikely that salts are altered chemically in the bowel, and I learnt from one authority that sulphur is liberated in the bowel by any aperient, and therefore it is only necessary to exclude salts on account of their aperient action. It would be interesting to know if any untoward results have been noticed in diarrhoea when sulphanilamide is taken.

Medical Advertisements by Post

DR. W. ST. AUBYN HUBBARD (Falmouth) writes: This morning I received another batch of advertisements from various firms, all of which were promptly put into the waste-paper basket. Most of us have this bother. But what a waste of paper, cardboard, and time—especially just now! I suggest that the time is ripe to ask the principal firms upon whose products we have always relied to give up their rather childish pictorial advertisements and limit themselves to plain statements of facts on a standard size of thin card, preferably small postcard size, which we can file neatly if we wish to do so. If the big firms would only arrange among themselves to do this we could safely consign all other advertisements to the waste-paper basket without perusal. This would save the profession a tremendous amount of time and annoyance during the year.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 12 1941

EFFORT SYNDROME IN SOLDIERS*

BY

JOHN PARKINSON, M.D., F.R.C.P.

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The problem of effort syndrome arises from the urgent need for men, and so it is first of military and secondly of medical importance. In war a maximum number of soldiers must be drawn from the mass of civilians accustomed to peace. The majority change over successfully from the occupations they had chosen, and by time and training become fit and often eager soldiers. But such a shift from home and work to a novel and strenuous life with drill and marching with heavy equipment is not possible to everyone, and it is disagreeable to some. All men are not equal under the test of war. Symptoms that were absent or so unimportant as to be ignored in peacetime begin or become aggravated under the stress of war. If a recruit has acquired no liking for soldiering he will complain the more easily and persistently. However that may be, he may be forced to admit his incapacity by complaints so similar to those of others that they are clearly genuine.

As the human organism does not give way as a whole, even when the whole being is on trial, one organ or system will first betray distress. It is commonly the nervous system—not surprisingly, because of the difficulty of adjustment to war and because nervous disorders are already so widespread in civil practice. In others the heart—or rather the circulatory system—will testify to the stress and present the symptoms. These may so strongly suggest a heart disease that only a painstaking examination will exclude it. D.A.H. (disordered action of the heart), now officially styled effort syndrome, was not invented by the R.A.M.C. in the last war; it was thrust upon them and so labelled in default of a better term. It is true that about a half had similar symptoms in civil life, but these were rarely combined to give a composite picture like that of effort syndrome in the Services. It constituted a big military problem because of the wastage of men it caused. Investigation showed there was no demonstrable organic heart disease. Questioning alone cannot distinguish these cases of effort syndrome from those of early valvular disease (V.D.H.). The part played by the nervous system, especially in the realm of psychology, was admitted, and influenced treatment, but it was insufficiently studied in the war of 1914–18.

The failure of heart disease is not the only way the circulation fails to respond to stress. With his nerve impaired the athlete may be dead-beat from an extreme test of endurance. He is exhausted and breathless, his heart is racing, and it is reasonable to believe that it is the circulation which sets the limit. Other systems—the vasomotor, the endocrine, and the respiratory with its chemical regulation—will share in the test and doubtless in the failure, but the reserve power of the heart is that which ultimately rations output. In effort syndrome we are dealing with men of every degree of non-athleticism and of physical and nervous inferiority, and when they undertake more than their low capacity for effort they also fail with exhaustion, dyspnoea, and palpitation—proof enough that their circulatory system cannot cope with the strenuous task of a soldier. Again, as in the athlete reaching his limit, the other systems named will doubtless take part in failure of the co-ordination which is essential to purposeful effort. An expression of this idea is seen in the term "neurocirculatory asthenia" (N.C.A.), applied in the United States to the condition we call effort syndrome. Our own term is not ideal, for it might suggest that in effort lies the origin of the disability, whereas effort merely reveals it. Further, the symptoms, while accentuated by effort, are often present at rest. But we are well rid of the terms "soldier's heart" and "D.A.H." Allbutt said that as "a series of symptoms recurring with a fair uniformity" he did not hesitate to look upon it as a disease. Its true nature is not yet known, but the full picture which bulks in war is only sporadically encountered in peacetime. Tentatively I would define effort syndrome as a *functional circulatory disease, most evident on exertion, unmasked or produced by war service.* It is hoped that the experience of this war will provide a better name, a more satisfying definition, and a clearer understanding of this condition.

The rarity of effort syndrome in the Navy and its infrequency in the Air Force have been much remarked, and the explanation is not obvious. Volunteers are in greater proportion in these Services; besides, they do not demand so uniform or so arduous a training of such a multitude of men for the toil of marching with heavy equipment.

The type of effort syndrome will vary to some extent with the kind of warfare being waged and with the class of patient studied by a particular observer. Thus in 1916 in France the soldiers were regulars or volunteers who had been fully trained, and many had been long and honourably engaged in trench warfare. The infectional group was fairly large, and the nervous group seemed smaller than the constitutional. In contrast, at the end of that war most men with D.A.H. returned to some civil employment and got well, many soon ceasing to be eligible for pension. The residue was largely composed of psychoneurotics, still clamant for their pensions, and psychotherapists were engaged in describing and treating this group. It cannot be doubted, too, that men originally reporting sick with typical effort syndrome may, with protracted idleness and numerous hospital transfers, acquire neuroticism as a sort of parasite.

In the present war, conditions so far seem to have produced a preponderance of the psychoneurotic type, and a greater proportion of those who had similar symptoms

* Based on a lecture given before the Royal Air Force Medical Society at Halton in October, 1940.

in civil life. Indeed, some current opinion is inclined to the view that effort syndrome is simply a psychoneurosis. It is not certain how far this definition will carry us, because the term can be so readily applied to any form of ill-health which is imperfectly understood and unaccompanied by organic signs. After all, psychological variations and faults in healthy people are common enough. It could only be a bar to medical progress if psychoneurosis (or psychosomatic disease) remained a label and became a dumping-ground for most unexplained illness, much as did "neurasthenia" in the past. It is still to be decided how far psychotherapy is rational and effective treatment; besides, an explanation for the predominance of circulatory symptoms, the relation to effort, and the relative uniformity of the clinical picture is not yet forthcoming. Certainly the time is ripe not only for psychological but for other investigations, as it would appear that autonomic nervous, endocrine, respiratory, and metabolic factors may also operate in effort syndrome, and will also engage the attention of the physician seeking a wider conception of its essential features. Doubtless this expanded approach has much to commend it, and will deepen and broaden our vision of what is at present obscure in the rationale of effort syndrome.

Aetiology

It is a fact that many, perhaps half, of the patients with effort syndrome give a circumstantial account of some similar symptoms in years preceding the war. These have seldom had the characteristic grouping or been severe enough to interfere with a sedentary occupation, to which indeed men may have drifted because of physical limitations. In civil practice the composite picture of effort syndrome seldom appears, or it is lost among the familiar but ill-understood symptoms which baffle doctors. It never obtrudes as a large and urgent problem in peace as it does in war. No fewer than 44,000 soldiers became pensioners for effort syndrome after the war of 1914–18.

The causes are often multiple, and this should be remembered in any attempted classification.

1. Constitutional

A man may be so ill-endowed in his physical frame or in his nervous make-up (and maybe in both) that he is thereby unfitted to become a soldier. A wretched upbringing, a poor physique, and a lack of vigour may be his permanent handicap. He may never have proved strong, either for games at school or for heavy work later. He is constitutionally a weakling, inapt for war, and training will never make him fit for it. If this could have been recognized at his first medical board he would have been rejected on this score, and there would have been one less of the "effort syndromes" in the hospital, before the medical board, and as an aspirant for a pension.

2. Psychoneurotic

From a faulty heredity, from maladjustment to the problem of living, from subconscious repressions, inhibitions, and conflicts, from excessive anxiety or hardship, singly or combined, a man may suffer from some psychoneurosis, commonly an anxiety neurosis, and his symptoms may arise entirely or partially from this cause. A few realize their inferiority and develop the complex with its sapping of nervous stamina. The cardiac bias is hard to comprehend, but it may originate in the special physical demands upon a soldier, especially when clad and cumbered so unlike an athlete. The neurotic, however strong physically, seldom succeeds in athletics.

Here should be mentioned the factor of like or dislike for soldiering. Some find in it a virtue and a fulfilment, better health and good comradeship, and occasionally a solution of some personal or even domestic problem. Quite a number of men, not cowards, dislike the idea and still more the process of training and discipline, which are essential. With no zest for the fight, and lacking spirit if not courage, they take refuge in sickness as a means of escape. Occasionally, too, there are men convinced by some careless or ill-founded suggestion of a "weak heart," and by past restrictions, that it is unsafe or beyond their powers to undertake full exertion. Related to this class are those whose nervosity is side-tracked into a belief or a cherished dread that their heart is diseased, and who cannot be dissuaded from that obsession. Such cases have been termed cardiac neurosis proper. More numerous are those who cling to the idea of heart trouble to escape what unhappily exposes them to scorn by the laity, the imputation of neurosis. Incidentally, knowing the explanation to be inadequate, we should not be misled by the man who ascribes his condition to some event, such as a minor infection or accident, which coincided with and perhaps faintly determined the onset of his symptoms.

3. Infection

The incidence of rheumatic fever in the history of soldiers with effort syndrome is higher than in that of healthy soldiers. In a control series of 1,000 slightly wounded men 5% gave a circumstantial history of acute rheumatism or chorea, while 12% of 500 men with effort syndrome gave that history. This almost suggests that rheumatism can produce, without valvular lesion, a permanent but minimal grade of myocardial inferiority. If it does, nothing would prove it so well as the ultimate development of auricular fibrillation, paroxysmal or established, in those suspected of such occult rheumatic myocardial involvement. The history of older patients contracting fibrillation, and having no other mark of rheumatism, not infrequently does include rheumatism in childhood. But the hypothesis lacks proof. The interesting suggestion has been made that the greater incidence of a rheumatic history in effort syndrome is explained by the meticulous precautions to which they have been subjected. Thus after uncomplicated rheumatic fever a boy is sometimes forbidden school games for a protracted period, losing their benefit, besides acquiring an unfounded distrust in his cardiac capacity. This may explain some cases, but hardly all.

There is no doubt that recent infections may occasion symptoms of effort syndrome when the convalescent returns too early to physical exertion. It was a commonplace in the war of 1914–18 for a soldier to contract P.U.O. (pyrexia of unknown origin) in the trenches, return to a base hospital, then to a convalescent depot, from which he was too soon drafted back to the line owing to urgent need for fighting men. He often returned quickly to the base with typical symptoms. In the Middle East amoebic and bacillary dysentery similarly proved a potent source. The lesson is clear: adequate convalescence after general infections in soldiers pays by preventing effort syndrome. Indeed, this has now been recognized in the excellent proposal that such men should retain the "diagnosis" of convalescence and only acquire that of effort syndrome when this can no longer be deferred. More, there is the interesting suggestion that such obvious cases of insufficient convalescence should not be included at all under any discussion of effort syndrome. Against this is the fact that the clinical picture may be identical with that of cases attributed to constitutional or psychoneurotic origins, and that it is awkward if a patient under treatment by the Medical Services is without a relevant diagnosis.

4. Myocardial Deterioration

In men over 35 or 40 the functional capacity of the heart has often appreciably lessened when compared with that at the age of 20 to 25; the more strenuous sports become unsuitable, though there are many exceptions. In reverse there are also exceptions. Many cases of coronary thrombosis have been reported under the age of 40, and so it is likely that there are lesser grades of coronary disease which contribute to or represent the ageing process as manifest in a diminished capacity for effort. Except in the extreme cases, we know little about this factor, and even less about the early effects of oncoming hypertension. The lesson is that here is an opportunity to extend our knowledge of the early effects of coronary sclerosis and of hypertension—to antedate them, as it were—for we have under medical supervision a multitude of men who would not be patients at all in peacetime, but who in war may report sick with symptoms which war effort evokes. However that as it may, if we are to contact more closely with the beginning of disease, careful cardiological examination is even more necessary in men of 35 and over than in

younger; and electrocardiography and radioscopy will metimes be needed for the purpose. The fear that a orough examination will harm by starting the idea of heart sease is unworthy and unwarranted. But morbid ideas may bred by routine and superfluous examinations, especially ien prolonged residence in a military hospital is improperly rmitted.

Symptoms

The symptoms are almost invariably multiple, and ten there is no particular stress on any one of them. he major are exhaustion, left mammary pain, palpitation, spnoea; the minor are dizziness, faintness. They are oked by exertion such as drill or marching, though later ey may recur at rest.

Exhaustion.—Nearly all complain that they are easily tired, d it may be this which limits their activity. Often a feeling lassitude makes any activity distasteful. Undue fatigue is ne of the most widespread of human complaints, and ldom does it point clearly to any diagnosis. In default signs it is often correctly attributed to the nervous factor; r it may be purely psychical, though it may equally be garded as a signal of general ill-health. Alone it should ever suggest actual cardiac disease, of which the characteristic is dyspnoea.

Left Mammary Pain.—This is a poor appellation for what common (young men excepted) in civil life yet a frequent omplaint in young men with effort syndrome. A large proortion, perhaps 40%, complain of it; indeed, this is the closest nk between the symptoms of effort syndrome and those of ivilian practice. Its site at or below the left breast, its haracter of aching with occasional stabs, its occurrence maybe or hours during rest as well as after exertion, are features hich readily and sharply contrast it with cardiac pain angina pectoris). Inveterate cases have local tenderness, as isclosed by the pressure of a stethoscope. No patient should ver be permitted to speak of left mammary pain as "pain n the heart," for it is this symptom more than any other hich suggests to him the false and dangerous idea of heart lisease. No fixation of fear should be allowed to develop rom a fixation of interest.

Palpitation.—Palpitation is consciousness of the heart's ction, and healthy people experience it under sufficient exerise or emotion. It is noticed too readily by men with effort syndrome, and may, like left mammary pain, make them loubt their heart's integrity. The conversion of a natural sensation of stress into a medical symptom depends mostly on the presence of a heightened or morbid sensibility from ill-health, and this is best proved in the cases in which actually *there is little or no tachycardia.* Compare such a sensitive man with the subject of fibrillation, who will complain of dyspnoea but often fail to notice his rapid and irregular heart. As some tachycardia, excessive on exertion, is the rule in effort syndrome, palpitation is a frequent symptom. If there happen to be a few extrasystoles these may augment it. With a given task it is most often the combination of palpitation, fatigue, and dyspnoea which defeats the patient and displays his malady.

Dyspnoea.—Although dyspnoea on exertion as a single symptom is so characteristic of cardiopathy, combined with other symptoms it appears more commonplace and less significant. It depends so much on the "condition" of healthy people and their age; it is expected in convalescents as it is in neurotics, in various infections, and in anaemias even of moderate grade. Dyspnoea is by no means always the chief symptom of effort syndrome, but it is generally included with the others. On direct inquiry it will always be admitted—impaired general health from whatever cause almost connoting short-windedness as a by-product. Interesting is the static dyspnoea (dyspnoea *at rest*) which in the absence of signs of organic disease is so often a manifestation of nervous instability or exhaustion and which is sometimes seen in effort syndrome. It may be a curious feeling of inability to take a complete and satisfying breath. This is not quite the same as "sighing respiration" (suspiration), though closely allied to it. Of course, such dyspnoea at rest without extreme dyspnoea on exertion and without cardiac or other signs is easily placed in its true category.

Dizziness and Faintness.—Dizziness may be no more than a momentary sensation of imbalance, and faintness no more than a transient sensation such as that which precedes a proper faint (i.e., syncope). They are so closely allied that patients often fail to make a distinction. Both are common in healthy people under certain circumstances and during temporary impairment of health, and especially with the weariness of increasing years. Similar sensations may swell the symptoms of effort syndrome, but they are seldom of as much account as a man may make out. Indeed, nothing lends itself so readily to exaggeration as a dizziness or faintness, for being rarely demonstrable it is difficult to disprove. It should not be fed by attention, always provided that aural and cardiovascular disease have been excluded.

Fainting or syncope is or should be a term reserved for attacks with loss of consciousness, and these are not especially common in effort syndrome: any soldier may faint on a parade ground. Syncope is one of the rarest symptoms of heart disease, though the public think otherwise. Recurrent faints are uncommon and may really be epilepsy.

Signs

Viewing the varied aetiology, it will not be expected that much can be learned from the general appearance. Some appear nervous or anxious, others are weary-looking; many look and act like any other soldier, but the seemingly well have their complaints, and looks should not heavily discount them. The examiner may judge them to be exaggerated, and occasionally he may sense a desire to shirk duty; but in fairness he must question and examine the man first as a doctor, and then assess his ailment as a medical officer.

Tachycardia is easily the commonest and often it is the only cardiac sign. It is generally moderate, at a rate of 80 to 100, though sometimes rates of 100 to 130 form a striking feature. There may be no tachycardia at all, or it may not be noticed but for the pulse count. Some tachycardia early in a medical examination is commonplace and insignificant, and some men have a higher natural rate than others. During the course of the examination, and especially with recumbency, it should disappear; if it does not, more notice—but not impressive or alarmist notice—must be taken of it. Extreme tachycardia suggests a preponderant nervous factor, in the absence of paroxysmal tachycardia and flutter and if pyrexial or thyroidal stimulation can be excluded.

Examination of the heart results in normal organic findings. The heart sounds are normal, and the loud first sound natural to tachycardia should not be misinterpreted. Similarly, a short soft systolic murmur difficult to hear can be ignored. Any wincing when the stethoscope is applied is a reminder that mammary tenderness is common with left mammary pain of long standing. The respiration is sometimes irregular or momentarily rapid under medical questioning. When dyspnoea at rest is a complaint it may be the inability to take a deep or satisfying breath or the sighing respiration already mentioned. Nervous tachypnoea is uncommon.

The blood pressure is normal. Even in young and healthy recruits, with the excitement and associated tachycardia of a medical examination, the systolic is not rarely 160 to 170, but it will fall shortly during recumbency, and the diastolic will not exceed 90. The blood pressure can scarcely be too low: certainly any figure between 100 and 110 systolic is to be regarded without suspicion and perhaps as a favourable sign. It is to be hoped that the fashion of imputing ill-health to "low blood pressure," often as a sop to the neurotic in civil life, will not extend to the Services.

Sweating may be too easily provoked, and sweat dropping from the armpits during medical examination was a familiar sight in the last war. Another sight was the

man who broke off during drill with a coarse and widespread bodily tremor; but such usually showed other stigmata of nervous unrest.

The *exertion test* has a limited but not a great value, if only because many with effort syndrome give a normal response, as in fact do some hospital patients with cardiac failure and oedema! It is better termed the pulse response test, as in the R.A.F., than the exercise-tolerance test. Such slight exercise as is used can in no way compare with the real drill or marching with equipment which originally made the man aware of his disability. The idea is that in health the pulse should return to normal within a minute of a test exertion, but there are so many exceptions to this arbitrary rule, and such wide individual variations in effort syndrome, that it takes a minor place in the summing-up and assessment. It does tell us something of the nervous control of the heart rate in a particular man on a particular occasion. More useful is the recognition of an undue degree of dyspnoea or distress from so slight an act of exertion. But here again, as in the nervous control of rate, who shall say what degree of improvement and stabilization may not be obtained by routine Army training? That is what it is for.

Differential Diagnosis

1. *Organic Heart Disease.*—The symptoms of effort syndrome are often grafted upon those of true heart disease. Whenever there is a history of rheumatic fever or chorea, or the patient mostly blames dyspnoea for his incapacity, *mitral stenosis* may be developing. Suggestive are a constant long systolic murmur or a loud first sound; and diagnostic will be the presystolic rumble preceding the loud first sound and best heard at or mesial to the apex, immediately after the subject exercises and lies half over on his left side. After the presystolic murmur there is no more authentic sign than the radioscopic—in the right oblique position, an enlarged left auricle displacing the oesophagus backwards. When the apex beat is displaced and forcible, often with a systolic murmur there, *aortic incompetence* is likely. This lesion is fairly common. With the patient leaning forward, the breath held after expiration, the observer listens intently at the aortic area and down the left of the sternum for the softly blowing diastolic murmur which follows close upon the second sound.

Angina pectoris, uncommon before 40, gives sternal pain or pain across the chest during exertion, and that as the only disabling symptom. This contrasts with the left mammary pain, an ache more or less continuous, lasting for hours and occasionally interspersed with a momentary stab, which a proportion of men with effort syndrome will report. From its position they may fear it is from the heart, especially if it occurs during or more typically after exertion. But it persists also during rest and even for a large part of the day. It may extend to the lower angle of the left scapula and occasionally above the left breast and even to the left arm, but never to the right arm or to both, or to the jaw. A simple table may help.

Angina Pectoris (Effort Angina)	*Left Mammary Pain*
Pain the only complaint.	Multiple complaints.
Uncommon below 40 years.	Age 20 to 55 years.
Sternal or across chest.	Left mammary or submammary.
Arresting pressure.	Ache (sometimes stabs).
During exertion only	*After* exertion; when tired.
Brief—1 to 5 minutes.	Continuous—hours.

Other *myocardial disease* is also rare under 40, and dyspnoea would then predominate and clinical or electrocardiographic signs would be found. Emphysema may be mistaken for it. *Paroxysmal tachycardia* is characterized by occasional attacks of palpitation with a high tachycardia (120 to 220) that begin abruptly, last some minutes or hours, and end suddenly. The sudden termination confirms the diagnosis more surely than the sudden onset. It is no more common in nervous than in other patients.

2. *Neuroses.*—When the chief complaints of a patient are of "nervousness," headache, fears, depression, weakness, and insomnia, and he presents a "nervous" manner, being restless, excitable, tremulous, and even emotional—provided other abnormal signs are absent, a doctor will recognize that he is faced with a functional nervous disorder, often an anxiety neurosis. Such is not effort syndrome. This is distinguished by an assemblage of prominent circulatory symptoms primarily related to exertion, any distinctly nervous symptoms being less troublesome to the patient and less apparent—if present at all—to the examining medical officer. This does not exclude, of course, a psychogenic element in their production. Incidentally, sleeplessness, indigestion, and severe headache are uncommon in effort syndrome.

3. *Pulmonary Tuberculosis.*—A history of pleurisy or a family history of chest trouble, with complaints of cough, wasting, loss of strength, perhaps pleuritic pain, would point to pulmonary tuberculosis. This was the only disease which counted much in the after-history of effort syndrome in the last war. The man may be thin, the skin ill fitting and moist, the pulse frequent; but tachycardia without other signs seldom implies tuberculosis. Auscultation of the lungs, the evening temperature, sputum examination, will follow. But radiography for early diagnosis is indispensable, and far more informative than the stethoscope.

4. *Hyperthyroidism.*—Especially in any high degree of tachycardia, the thyroid gland will be scrutinized; and, conversely, without tachycardia the idea of goitre may be dismissed. The subject should sit leaning forwards, raising the chin, and then swallow. The standing observer can then best see any fullness or asymmetry of the gland. There may be wasting, fine tremor of the fingers, and even a hint of exophthalmos. The hands are warm, not cold as so often in effort syndrome. The B.M.R. may help.

5. *Hypertension.*—This is so often found in middle age that it ought to prove possible to recognize the earlier stage in a proportion of the men of 30 to 40 now called to the colours. A closer study on these lines, with correlation of slight symptoms and signs (if any) with blood-pressure readings, might add much to our scanty knowledge about early hypertension. Under excitement and with tachycardia, the systolic level in health can reach 160 to 170, though subsequent readings will seldom exceed 160. But a diastolic level of 90 to 100 makes a pathological hypertension likely, and patient research might teach us much about this critical level. An obtrusive apex beat, a loud aortic second sound, and sometimes a mitral systolic murmur are well-known concomitants, and there may be albuminuria; but repeated sphygmomanometric readings alone can establish the diagnosis.

6. *Various.*—A number of other diseases figure in this differential diagnosis or bear upon it. They include chronic bronchitis, emphysema, asthma, pleurisy; anaemia (primary or secondary); renal disease; aural vertigo ("dizziness"); epilepsy ("fainting"). It may be said that malingerers are few, shirkers not a few, exaggerators common. The important tetrad in differential diagnosis is valvular disease, pulmonary tuberculosis, hypertension, and hyperthyroidism.

Prognosis

The most promising cases are naturally those of men with slight symptoms of recent origin who want to get well and remain with or get back to their comrades. Men with symptoms following close upon some acute infection will

ften lose them if they receive consideration and a suffi-ient convalescence. Where symptoms are of long standing, nd where considerable tachycardia persists, the prognosis s to improvement is poor, especially in men intent on eing discharged from the Army and therefore disposed to urse any malady instead of combating it. Those with ny long persistence of left mammary pain are un-romising. The more the nervous and psychic symptoms olour the picture the more problematic is a return to full luty. Graduated drill is intended not only as a part of reatment but as a means of sorting and assessment for rading.

The first concerted research on effort syndrome (D.A.H.), t Hampstead in 1916, was conducted on the most "typical" cases available, and the inferences therefrom as o prognosis are inapplicable to the majority. Later in the var prognosis improved, especially among men treated by nedical reassurance, drill, and games, and those who emained in France in convalescent depots. About 50% ecovered, and most of these then remained for reasonable periods at full duty in the line.

Prevention and Treatment

Prevention.—It will be to the country's advantage if ecruiting medical boards have freedom, as I believe they ave, to reject or place low in category men likely to become the subjects of effort syndrome. Such would especially be those with similar symptoms in civil life, certainly if because of them they had lost much time at work and been under their doctor or had changed their occupation. Further, weaklings of poor physique unlikely to improve by training, and those obviously of a nervous make-up, can seldom reach the highest grade of service. Nor can those with a persistent high tachycardia. For war purposes a convenient term to cover these cases would be "potential effort syndrome" (or potential E.S.).

If already accepted and serving, a man at his unit showing constant incapacity for prolonged exertion may be allotted a less onerous job in which he will prove useful instead of swelling the number with effort syndrome. It is better to keep him with the unit if at all possible, avoiding this diagnosis. If he is unfitted for the lighter work, or if none is available, the sooner he is discharged the better. The difficulty is, of course, to form a right judgment when there seems to be a studied attempt to evade service by importunity of complaints, especially as shirking in this form may become contagious. Discipline as well as encouragement is required from the medical officer, and a skilful mixture may restore and reinstate the milder cases. The importance of adequate convalescence after general infections or bronchial attacks has already been mentioned.

Treatment in Hospital, Camp, or Special Centre.—Rest in bed is absurdly out of place, and medicine is anathema. Once it is clear that there is no organic disease and the condition is properly classed as effort syndrome, further close examinations are redundant and may be harmful. The period in hospital should be as short as possible, for diminished discipline demoralizes a soldier. The heart is dismissed from the mind of the medical officer and by every means from the mind of the soldier. He is clearly told that the heart—and lungs—are sound, and that he is out of condition. He is not expected to retail his complaints again, but to get into condition and a healthier frame of mind.

Psychological methods of treatment are being tried in this war. They are likely to have much the same measure of success as they have with the common functional ill-health of practice in civil life, though under war conditions and in the mass they will be placed at a disadvantage. Many men who really want to get well and to remain in the Army are likely to be helped greatly by understanding doctors and especially by those who are experienced in psychotherapy.

Graduated drill under an intelligent and co-operative instructor is needed to promote physical fitness, and is a sound method of reassurance by implication; but games are equally important, and every incentive to recover by suggestion and distraction should be employed. Failure of such treatment will be recognized in men of good will by the production of symptoms and visible signs in the course of such retraining. It is no use taking pulse rates; undue dyspnoea, obvious distress, and abnormal exhaustion are the useful indications. It will be difficult to deal with the shirker. A capable instructor will help greatly in deciding whether further treatment is worth while in particular cases. If not, discharge or lower grading of the genuine incapable is indicated, and the sooner the better if rehabilitation in civil employment is to be accomplished. By such sorting the standard among the progressive group is maintained and encouraged. The ideal result is achieved when a man ceases to complain, willingly carries through his treatment, and acquires a healthy desire to return to and remain with his unit.

CLINICAL INVESTIGATION OF SHOCK

BY

ADRIAN C. KANAAR, M.D., M.R.C.P., F.R.C.S.Ed.

Captain, R.A.M.C.

Now that the battle is raging over home soil, treatment of casualties is simplified by having all the resources of long-established and well-equipped hospitals at our disposal. It is suggested that this advantage be exploited by making and preserving records of cases of shock. Analysis of such case records is a valuable form of clinical research, and a standard shock-record card would assist comparison of results from different methods of treatment. The making of such records would be within the scope of many medical officers in charge of resuscitation wards at E.M.S. and military hospitals and would be a practical supplement to the more detailed work organized by the Medical Research Council Shock Committee.

The advantages to clinical research of recording the pertinent data of cases of shock on a special card were emphasized by Brittain and Latter (1940), and the hope was expressed that a suitable standard card would be produced for use in E.M.S. hospitals. Moreover, apart altogether from research and private case notes, there is a need for some written record of the amount, speed, and time of transfusions, and the extent and rate of improvement in blood pressure and general condition, since such details assist the surgeon in deciding on the best moment to operate and when further restorative measures are required. Such a card has advantages over the case sheet, since it involves less descriptive writing and obviates omissions.

The Resuscitation Records Card

It was with these considerations in mind that the card here reproduced was planned during seven months' experience of keeping case records as O/C Army blood transfusion team. Although work on this card was begun in October, 1939, it has not been published before, as it seemed desirable to remould it after gaining experience of its use and after receiving the help and criticism of a number of authorities. The card may still have imperfections, but it seems best to publish it now in the hope that others may wish to use it.

A study of papers on blood and plasma transfusions shows that the value of the conclusions drawn has often been markedly limited by the small number of cases observed. In some instances (Brewer, Maizels, Oliver, and Vaughan, 1940) the numbers have been increased by pooling the results from several centres, and such a co-operative method has distinct advantages. The present card readily lends itself to organized "pooling," and i might be possible to study several thousand cases in a fe months if severe air raids continue.

As co-ordination is of importance I would be glad if al who intend to utilize this card would communicate wit me c/o The Royal Society of Medicine, 1, Wimpole Stree W.1: I would welcome any suggestions which result fron

Resuscitation Records Card

No. .....

Name ..... Address .....

Age..... Sex..... .....

Soldier's No. ..... Rank ..... Unit.....

Approximate weight .....

Cause of injury ..... Designation of medical unit

.....

Date & time of injury ..... Morphine (Before admission) Dose | Time

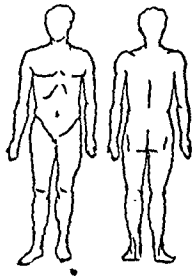
.....

Date & time of admission..... A.T.S. ..... units at .....

..... A.G.S. ..... units at .....

Section A. * History

Injuries Sustained



* Add brief notes, where possible, on condition and treatment before admission—e.g., dehydration, cold, pain, severe haemorrhage, sepsis (especially gas gangrene), morphine, and chemotherapy.

Section B. Severity of Shock on Admission and during Treatment

Times										
B.P.										
Pulse rate										
Character of radial pulse										
Temperature										
Temperature of limbs to palpation										
Colour										
Respiratory rate										
Restlessness										
Hb %										
Addenda *										

* E.g., coma, concussion, apathy, character of respiration, dryness of tongue.

Section C. Treatment of Shock after Admission

1. Administration of Fluids:

(a) Intravenous

Ref. No. of Bottle*	Time Start	Time End	Nature of Fluid	Reactions; Notes

(b) Oral

(c) Rectal

* Containing ½ pint, unless otherwise stated.

Section C (continued)

2. Morphine

Dose	Time

3. Chemotherapy

Drug	Dose	Time

Addenda (e.g., oxygen, cortin, etc.) .....

.....

Section D. Operation

TIME

Anaesthetic.....Start..... End.....

Procedures .....

.....

.....

Section E. Remarks and Summary *

.....

.....

.....

..... Signed .....

Section F. Later Notes

Date			
Hb %			
Dehydration			
Sepsis			

* E.g., factors tending to prolong shock; summary of course and progress.

Scale: Approximately half size of original.

their experience of its use. Cards may be obtained at short notice from G. E. Austin, 27, The Market Place, Richmond, Yorks ('Phone: Richmond 433), at 2s. 6d. for 20, 4s. 6d. for 50, 6s. 6d. for 100 approximately.

Some of the advantages obtained from the use of this card are:

1. The stiff cardboard facilitates writing.

2. The card is adaptable, and therefore equally useful to an ordinary resuscitation department or to a research team. For the latter purpose additional investigations such as blood volume, plasma proteins, etc., can be put in the "addenda" column.

3. The only special investigation requested is that of a series of haemoglobin estimations from a single site. These take very little time and are a useful guide to the degree of alteration in blood concentration effected by treatment. It is hoped to publish shortly a note on the interpretation of the haemoglobin percentage in relation to shock, and a copy of this could accompany the card.

4. Time is saved by diagrammatic indication of injuries and by use of a system of grouping of individual symptoms into (1) slight, (2) moderate, (3) severe, (4) very severe, the number being inserted in place of words.

Description of Card

The card is a single sheet of stiff white glazed cardboard, printed on both sides, which, folded in two, forms four pages, each 6 by 7½ inches. It will provide a means of assessing the value of blood, plasma, and other remedies, alone or in combination. There may be difficulty in obtaining strictly comparable cases on which to base an opinion, but this objection is more apparent than real. For example, if any combination of remedies is really better than another it should appreciably lessen the time taken to raise the systolic blood pressure to 85 mm. Hg in series of cases in which it was below 60 mm. Hg at the start of treatment. If a large enough number of cases—e.g., several thousand—were analysed after treatment by two different methods, the other variable factors, such as degree of haemorrhage, amount of trauma and pain, duration of lesion before treatment, etc., would tend to equalize out or could be analysed separately in groups. The final test is the survival rate of severe cases.

Sections B and C

These are described first, since they are the kernel of the investigation, and should be completed in all cases. Not every point in Section B need be noted at each examination. For example, if on admission a man is pulseless, with a blood pressure of 30 and a temperature of 95° F., there is no object in estimating his blood pressure or taking his temperature again until his pulse is palpable and his limbs are becoming warmer to palpation. One should just press on with energetic treatment, making every quarter to half an hour a brief record of any significant change in his vitality. Blood-pressure reading alone, without any other record of shock phenomena, would give a fair indication of the results of treatment.

Answers regarding severity or degree of departure from the normal should be classified into four groups. In general these are: (1) slight, (2) moderate, (3) severe, (4) very severe. These terms will apply readily to vomiting, sweating, pain, restlessness, and rigors. A similar system of groups can be employed for: (*a*) pulse character—(1) fair, (2) poor, (3) thready, (4) impalpable; and (*b*) limb temperature—(1) slightly cool, (2) cool, (3) cold, (4) very cold. Such a classification saves much writing, and can give quite a good mental picture of the case. The skill of the observer will increase, and the individual variations of different observers will decrease, as experience of war casualties is gained. Exact details, whenever they can be given, are preferable to grouping (e.g., "Vomited 500 c.cm. at 17.00 hrs.").

Estimations of degree of shock before and after treatment are the essentials of the investigation, and these are of a reliable objective nature, provided that the blood pressure and temperature are recorded.

Estimation of Haemoglobin.—This investigation can usually be arranged in all but the busiest times. The method used should be stated. Haemoglobin estimation will reveal the extent of haemoconcentration in shock without haemorrhage (Moon, 1938), and a series of such tests are a valuable indication of progress with regard to haemorrhage and shock when under treatment (Keith, 1919; Robertson and Bock, 1919) and also during the post-operative administration of fluids (Jones and Morgan, 1938). Interpretation, however, requires some thought, since a plasma transfusion may cause a rise of haemoglobin in a case of haemorrhage (Brennan, 1940) and a blood transfusion may cause a fall. The former anomaly is apparently due to the mobilization of red blood cells which were static in the capillaries, while the latter findings are due to stimulation of the physiological response to haemorrhage—namely, withdrawal of fluid from the tissues into the blood stream.

Addenda.—Additional facts or special investigations may be noted when desired.

Continuation sheets of Section B are obtainable, and can be pinned to the card if required.

Reactions.—These refer chiefly to rigors and to sudden dyspnoea, pain in chest, cough, and collapse, with oedema of the lungs, which may result from giving intravenous fluids too quickly. Pain in the loins, bursting headache, tingling all over the body, and collapse followed after a latent period of two to seven days by anuria (Riddell, 1939) resulting from a mismatched transfusion, would also be recorded if they ever occurred. An attempt should be made to exclude inflammation as the causative factor before ascribing rigors, pyrexia, and jaundice to blood transfusion. Suspected haemoglobinuria should be confirmed by a pathologist if possible.

Fluids by Mouth and Per Rectum.—It is important to comment on the amount given, as "forced fluids" are an important factor in speeding up dilution of the blood after haemorrhage (Robertson and Bock, 1919).

Morphine and Chemotherapy.—The relief of pain and the control of infection (especially gas gangrene) have an intimate bearing upon the degree of shock, and should be carefully recorded.

Oxygen.—Details should be given of the mask used and volume of oxygen given per minute, with the duration.

Cortin, etc.—Synthetic adrenal cortical extract may be worth a trial, in view of reported results (Scudder, 1940), especially when physical exhaustion has been a contributory factor in the condition of shock. Ergotoxine is certainly deserving of trial, as shock may be due to over-stimulation of the sympathetic nervous system (McDowall, 1940).

Section A

Additional knowledge may be gained by a careful study of causative factors in cases of shock, and a note should be made of these in Section A if there is time to do so. There will be many occasions when this is impossible, but much can be accomplished by good organization and training of the transfusion personnel. An example of what can be done under war conditions was shown in January, 1940, at a meeting of a medical society in the B.E.F. in France, when a surgeon (Challenor, 1940) who had worked at a casualty clearing station in the last war produced a book in which were entered details of all his operations. These had been dictated by him to a theatre clerk towards the end of each operation. In addition M.R.C. cards were completed for many special cases, in order to trace their course after they had left the casualty clearing station.

Sections D, E, and F

Section D: Operation.—Brief details will suffice to complete the clinical picture.

Section E: Remarks and Summary.—This should be completed after a day or two, or later if possible, to indicate the ultimate outlook of the case.

Section F.—A note of the haemoglobin two to five days after the operation, in the absence of dehydration or severe infection, will give some idea of the extent of the original

blood loss, and may be of interest in retrospect, when compared with haemoglobin readings during the phase of shock.

Suggested Procedure

(*a*) General duties orderly or clerk to complete details on top of page 1 for each case on admission to resuscitation wards.

(*b*) *Nurse or trained nursing orderly* to complete sections A, B, and C under supervision. This may be done while he is waiting for the blood or plasma to warm up and while he watches it pouring in.

(*c*) *Resuscitation officer,* (i) on admission, to take rapid history, do brief examination, and order treatment; (ii) introduce needle and collect blood for haemoglobin estimation; (iii) later read A and B and add any further comments and notes, indicating his views of the severity of the various symptoms, signs, and complaints, and ordering further treatment; (iv) complete later notes, after two to five days if possible.

(*d*) *Nurse or trained nursing orderly* to accompany severe cases during operation, to supervise transfusion, and to complete operation and anaesthetic notes and records of blood loss at operation. Where possible the nurse or orderly who has resuscitated the case should be detailed for this work to ensure continuity of treatment and interest, but if one cannot be spared the co-operation of the anaesthetist should be invited.

Summary

The desirability of a standard record card for cases of shock in E.M.S. and military hospitals is stressed.

A resuscitation record card designed for practical utility and suitable for statistical research is described and illustrated. Copies of this card are readily obtainable.

It was from suggestions of Lieutenant (now Major) H. W. Rodgers in January, 1940, that my blood transfusion record card was greatly improved.

My thanks are due to Major H. L. Marriott and Captain A. Kekwick for many helpful suggestions, and to Majors Hadley and Kimbell for repeated assistance in remodelling and improving the card.

Latterly I have had most useful advice from Prof. J. A. Ryle and Colonel L. E. H. Whitby, O/C the Army Blood Transfusion Service, as a result of which the card has been much shortened and its objective focused on results of treatment. Finally, a number of its details have been modified on advice from Prof. T. B. Davie, Dr. H. F. Brewer, and Lieut. J. B. Hurll.

In making these acknowledgments I must, however, accept full responsibility for production of this paper.

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M. Schmouchkovitch (*Thèse de Paris*, 1940, No. 284) records twenty-one cases, in patients aged from 11 to 53, indicating the importance of inherited or acquired syphilis in the causation of appendicitis. Clinically there are symptoms of appendicitis—tenderness at McBurney's point and muscular resistance—which yield to anti-syphilitic treatment. Anatomically there may be a characteristic diffuse lymphocytic infiltration in the appendix, a sclero-gummatous process destroying the whole organ, gummatous ulceration of the wall of the appendix, or a plasmocytic granuloma, which is the last stage of a gumma which has perforated the muscular wall of the appendix. Lastly, the *Treponema pallidum* has been found in the appendix.

SARCOIDOSIS

SOME SPECULATIONS AS TO THE STAGES OF INFECTION IN GENERAL

BY

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Considerable attention has recently been devoted to the condition described as the "sarcoidosis of Boeck." This paper gives details of an unusual case in which there were signs and symptoms suggestive of a "visceralization" in the central nervous system, producing the clinical syndrome known by the name of Adie.

The mere report of an unusual case is scarcely novel, but it appears that a consideration of the pathology and possible aetiology of the sarcoidosis of Boeck may well lead to an understanding of the mechanism of infection and immunity in general. Some discussion of these possibilities is attempted after a description of the particular patient.

Case Record

Mrs. A. provided a diagnostic problem lasting for nearly two years from November, 1936. She was 53 years of age when she was referred to my clinic at the Hull Royal Infirmary in that month. She had for three months past been complaining of a "blurred patch" in the lower part of the field of vision of the left eye. Apart from occasional pains in her hips and back, she presented no other symptoms of any sort. A past history of so-called "muscular rheumatism" ten years ago was elicited, but she denied any other indispositions. On examination the pupils were found to be inactive—there being no response either to light or to accommodation—and she seemed to have a tendency to Rombergism. There was, however, no sensory loss to pinprick, postural change, or vibration. The grip of both hands was firm, strong, and equal, but a slight tremor of a coarse sort and of "intention" type was noticed. The gait was fair, but although the arm-jerks were normal both ankle-jerks were absent and also the right knee-jerk. No other grossly abnormal physical signs were detected.

She was admitted to the Hull Royal Infirmary under my care on November 16, 1936, and it was found that the Wassermann reaction of the blood was negative. The cerebrospinal fluid was not under pressure and was not abnormal in respect of its cell, protein, or glucose content. The Wassermann reaction of the fluid was also negative. Further clinical examination showed sluggishness of both biceps-jerks and, later, probable absence of the biceps- and supinator-jerks. Perimetry confirmed the constriction of the field of vision of the left eye, and ophthalmoscopy presented a confusing picture. The left optic disk seemed pale and the left retinal vessels were narrowed. The appearances were suggestive of secondary optic atrophy. The veins of the right retina were engorged and the right optic disk appeared to be affected by a mild papilloedema. These findings were confirmed by the ophthalmic surgeon (Dr. Stenhouse Stewart). A radiograph of the skull (Dr. J. E. Bannen) was reported upon as showing no abnormality. Apart from a suggestion of possible neuromyelitis optica no definite diagnosis could be formulated, and Mrs. A. left the Infirmary early in December, 1936. Later that month she consulted Dr. W. Russell Brain, who informed me that he considered her to be a case of Adie's syndrome with tonic pupils and absent tendon-jerks.

The patient continued to attend my follow-up clinic, but her condition remained unchanged and no further symptoms were remarked upon until May, 1937. At this time both parotid glands began to swell. The enlargement was more pronounced on the left side than on the right, and it was not accompanied by pain, fever, or any constitutional disturbances. On June 19 the parotid swellings seemed quite unchanged. A degree of incoordination, as shown by finger-to-finger and finger-to-nose tests, was evident, but the other neurological findings, given above, were quite unaltered. A radiograph of the chest taken

at this time was reported on as showing "no evidence of any tuberculous infiltration." She was admitted to the Hull Royal Infirmary again, and a portion of one parotid gland was removed for histological examination. The appearances were diagnosed by the pathologist (Dr. W. W. Adamson) as being due to tuberculosis, but examination of the section, while showing a granulomatous reaction with giant cells, failed to reveal any definite areas of caseation. The injection of an emulsion of the pulped tissue into a guinea-pig had been suggested, but this was not performed.

During her stay in hospital on this occasion the left optic disk still seemed very pale, but the outline of the right disk was perhaps rather less blurred than before. The defect in the field of vision was persistent and unchanged. The Mantoux reaction was negative as well with a 1 in 1,000 as with a 1 in 10,000 solution of old tuberculin. The parotid swellings gradually subsided, and the patient returned to her home on September 20, 1937.

When Mrs. A. was next seen she stated that "trouble with her eyes" began about the end of October, 1937. Later she also developed pains in and swelling of the small joints of the hands. She was readmitted to hospital on January 8, 1938, with a diagnosis of episcleritis. A small portion of corneal tissue was removed by Dr. Stenhouse Stewart, and the histological appearances were again considered by the pathologist to be those of tuberculosis. It was considered, however, for reasons similar to those previously mentioned, that the appearances were more probably those of the sarcoidosis of Boeck. The Mantoux reaction remained, as before, persistently negative. Clinical examination showed some periarticular swelling of the small joints of both hands, and the neurological changes were as previously described.

The inflammatory changes in the eyes subsided fairly satisfactorily, and the following report was given me by Dr. Stenhouse Stewart: "The margins of the right optic disk are ill defined and the left disk is paler than normal, especially on the nasal side. This pallor has neither the appearance of a primary optic atrophy nor of a secondary one, the margins of the pale disk being well defined. This might, however, be possible in an atrophy secondary to a low degree of neuritis. The grosser sectoral field-loss of the left eye, being in the lower nasal quadrant, should correspond to the upper pole of the disk, but the left disk is no paler here than elsewhere. Is the visual lesion here possibly of the nature of chiasmal opto-arachnoiditis?"

Further investigations included another radiograph of the chest, which was reported on as showing no disease at all. The hands were also examined radiologically, and showed no evidence of tuberculosis, arthritis, or any bony changes. The total white blood cell count was 15,000 per c.mm., the differential percentages being: polymorphs 65%, lymphocytes 25%, large mononuclears 6%, and eosinophils 4%. An Arneth count gave a "weighted mean" (polynuclear index) of 2.68. The sedimentation rate of the erythrocytes was definitely increased (36 mm. in one hour), even although this rate was less than this (25 mm. in one hour) just before her discharge.

After her discharge the patient was seen again at my follow-up clinic. The eyes seemed much better, but the restriction in the visual field was unchanged. The periarticular changes in the hands had subsided, but the ankle-jerks and the right knee-jerk were still absent. On the whole, however, her general condition was decidedly improved.

Commentary

This patient seems to have been affected by the sarcoidosis of Boeck, and I am not aware that any case of this condition showing neurological signs and symptoms has previously been reported. It is possible that similar obscure cases may be due to similar pathological changes. Certainly, the syndrome of Adie rarely appears to have any anatomical basis, and a review of such cases (Adie's syndrome) might perhaps reveal further examples of the visceralization of the sarcoids. The above facts are merely adduced to illustrate the considerable variability of the manifestations of this condition. A full review of the subject is given by Snapper and Pompen (1938) in an excellent monograph, and this variability of symptomatology has also been stressed by Bodley Scott (1938).

It is now generally conceded that the uveo-parotitis of Heerfordt (1909) is a clinical variant of sarcoidosis. It was previously maintained that uveo-parotitis was invariably of tuberculous aetiology (Garland and Thomson, 1934), despite some evidence considered to point to the contrary (Lewis, Raines, and Stewart, 1936).

It is said that cases of sarcoidosis show a "positive anergy"—i.e., that they are more often Mantoux-negative than normal persons of the same age—and the findings in the case reported are consistent with this view. Lemming (1940) has failed to produce tuberculin-sensitiveness in cases of sarcoidosis even by the administration of living B.C.G. vaccine. Although such findings might be considered as evidence against a tuberculous aetiology for sarcoidosis, or rather as evidence of a considerable immunity to tuberculous infection, no explanation is given why a lesion in which no bacilli are demonstrable should not only persist for years but continue to develop in fresh sites. A remarkable case was reported by Wiseman (1938) in which tubercle bacilli were detected in the ulcers of the leg, said to be due to Boeck's sarcoid; but, as Ingram (1938) pointed out later, the evidence for the diagnosis of sarcoidosis was by no means conclusive.

The suggestion is made that Ranke's (1928) classification of tuberculosis may be extended and applied to almost any infection and that considerations of this sort may lead to an explanation of the above-mentioned facts. Ranke divided the tuberculous state into three stages, each characterized by its own type of tissue reaction. The primary stage, or stage of invasion, usually occurs during childhood for the majority of the population: it is symptomless and signless. In the secondary stage "tissue allergy" is said to develop, and, although it may also be symptomless, signs are present in the shape of positive tuberculin reactions. The lesions of this stage are exudative in nature—e.g., some cases of erythema nodosum, and some cases of uveo-parotitis, and even, possibly, some cases of Boeck's sarcoidosis. In the tertiary stage, with typical proliferative active tuberculous lesions, the skin tests with tuberculin may reveal a lessening of tissue hypersensitivity and an increase in tissue immunity.

It is common ground that any infection goes through very similar stages. There is an incubation period representing Ranke's first stage—the stage of invasion; and finally there is the fully developed disease. The problem of the second stage is less clear, but every physician sees many unexplained abortive cases which may well fall into this group. Cases of "threatened pneumonia" are not uncommon, and, in particular, cases of "meningism of uncertain aetiology," in which the tension of the cerebrospinal fluid is increased and yet no signs of definite disease can be made out in any part of the body, are often seen. Such cases, I consider, represent the second stage of an infection. Invasion has occurred, followed by an exudative tissue reaction, but the bodily defence mechanisms have in these particular cases overcome the invading organisms before the typical third-stage appearances of a recognized and recognizable disease have developed.

In view of Lemming's experiments it is permissible to conjecture that the second stage may be a non-specific one. Invasion may occur, and the second stage may actually be the development of either tissue allergy or anergy, according to the balance struck between the invading germs and the bodily defences. The type of tissue reaction may well be the same for all infections. Sarcoidosis may represent a typical second-stage lesion, as in my opinion does the particular type of it described as uveo-parotitis (Lewis, Raines, and Stewart, 1936). It is likely that a majority of

cases are the response of the tissues (anergy or allergy) to a tuberculous invader, but it is more than likely that the second stage in infection is a non-specific one, and that the appearances of disease of a common sort are only produced when the balance between attack and defence is so disturbed as to allow of the development of the proliferative lesions of the third stage of disease, with the characteristic tissue immunity.

Summary

An unusual case of sarcoidosis is described, with "visceralization" in the nervous system, producing Adie's syndrome. Episcleritis and uveo-parotitis occurred later in the same patient.

A general discussion of the possible mechanisms of infection is attempted, and it is maintained that conditions such as sarcoiditis represent a non-specific second stage of disease.

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AN OUTBREAK OF ACUTE GASTRO-ENTERITIS AMONG TROOPS IN A LARGE TRAINING AREA

PRELIMINARY REPORT

BY

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In the midsummer of 1940 a few sporadic cases of enteritis of a very mild type occurred in a military camp, and despite all efforts no causal factor was discovered. None of the cases conformed to any of the known diseases with which diarrhoea of the small-intestinal type is associated. In several there was definite enlargement of the spleen, and in one case it was palpable for several weeks. It was never tender on palpation. Agglutination tests for typhoid and paratyphoid groups and tests for *Brucella abortus* gave negative results.

From the opening of the camp in the beginning of September, 1939, no case of typhoid, paratyphoid, or dysentery had occurred until this outbreak, and none has occurred since. T.A.B. inoculations had been carefully and widely carried out, and very few, if any, of the troops were not fully covered.

About the middle of September, 1940, a definite epidemic of gastro-enteritis began, and it still persisted at the time of writing (December 18). This was not limited to the military units, but existed among the civil population in the immediate vicinity, though apparently it has not been investigated by the civil authorities.

Every effort has been made to exclude the possibility that infection has been conveyed by foodstuffs, the milk supply, or the water supply. Repeated bacteriological examinations of these sources have been made, and all have been persistently negative for the typhoid group, the *Salmonella* group, staphylococci, and streptococci. Many specimens from the food served to all ranks in the camp were examined, including meat, sausage, margarine, cake, bread, and cheese. The water supply, which came from the mains of the near-by town, was chlorinated during the period of investigation.

Among a very large number of troops about 150 reported sick, and some 30 of these had to be admitted to hospital. In addition many had had similar symptoms but of such mild degree that they did not seek medical advice. In those cases admitted to hospital every effort was made to obtain a careful history of the illness and its opening phases, and thorough bacteriological examinations were made of the faeces and the blood in the acute phase and during the convalescent stage ten days after the onset and later. All bloods sent to the laboratory were cultured. It may be noted at once that the bacteriological examination of both blood and faeces was entirely negative. Blood counts were not done, and as we were unable to obtain specimens the vomit was not submitted to laboratory examination. The history of the illness was not constant, though 60% conformed very closely to what we can call the typical case. In such a case the patient retired to bed feeling perfectly fit. In the early hours of the morning he or she would wake up with intense and urgent vomiting, followed by diarrhoea of a very watery type. There was little malaise, and the most prominent symptoms apart from diarrhoea and vomiting were mild backache and a feeling of heaviness in the abdomen. The diarrhoea varied from a few motions a day to, in one case, twenty-six motions. The stools contained no blood or mucus; they were offensive, of the typical small-intestine type, and usually chocolate-coloured. The course of the illness in its acute stage was short. Most patients had a temperature varying from 99° to 100° for from twenty-four to thirty-six hours. A few had a higher temperature, but none over 101°, and in a few cases the pyrexia persisted for seventy-two hours. There was no prostration in any case, and immediately after the acute phase all patients complained of hunger and asked for food. Convalescence was smooth and rapid, and only a few cases relapsed. Most of those infected were fit to return to duty in about a week from the onset. During the acute stage the tongue was slightly furred; redness of the fauces was often seen; there was no skin eruption or epistaxis; and abdominal palpation revealed nothing except splashing in the right iliac fossa. The spleen was never palpable. There was no distinctive feature in the pulse rate.

Atypical cases had vomiting and no diarrhoea, or diarrhoea and no vomiting, the clinical course otherwise being similar to that of the typical case. The bulk of the cases were ambulatory. In a number of atypical cases there were prodromal symptoms of a few hours' duration. These consisted of a feeling of malaise and shivering. In a series of 76 cases 50 had diarrhoea and vomiting, 6 vomiting only, and 20 diarrhoea only. The epidemic was still prevalent at the time of writing, and a few recent cases have developed respiratory catarrhal conditions either previous to the gastro-enteritis or immediately following the attack. Whether there is any significance in this it is too early to decide.

It is as yet impossible to define the incubation period with any real accuracy, but in the light of our present experience it would appear to range from thirty-six hours to seven days. Recently the cases have occurred in such a manner as to suggest that the illness is passed from patient to patient by contact infection, and we have noticed that men sleeping in beds adjacent to known cases have developed the gastro-enteritis during what we consider to be the incubation period. There is no epidemiological evidence to suggest infection from food, water, or milk as the causal factor. The outbreak has not been explosive in character and is obviously of a protracted type.

We cannot at present do more than suggest possibilities as to the cause of this epidemic. Unfortunately we have not been able to refer to the literature on this subject. We have, we believe, excluded the common causes of acute diseases of the gastro-intestinal tract—namely, typhoid, the paratyphoids, the dysenteries, and the *Salmonella* group—and food poisoning due to staphylococci and streptococci has also been excluded. The chemical causes have not yet been excluded, and this is to be part of our further investigations.

It is possible that this outbreak is of virus origin and similar to the so-called gastric influenza, or the gastro-enteritic type of distemper in dogs or swine fever in pigs. Bloods from different cases presenting the symptoms are being examined at the Wellcome Institute, London, for the possibility of virus infection, but no results are yet available. It is hoped that this preliminary paper will stimulate investigations at other stations which may have similar outbreaks, and at a later date we hope to publish further observations and to have available the results of the work at the Wellcome Institute, together with the results of blood counts and the examination of faeces and water supply for any possible chemical cause.

We wish to thank Dr. D. T. Robinson, who has worked in the closest co-operation with us in these investigations and who has been entirely responsible for all the bacteriological work; also Major-General W. Brooke Purdon and Colonel D. Ahern for permission to publish this preliminary note. We wish especially to stress how close and cordial are the relations between the emergency public health laboratory and the R.A.M.C. in this area.

THE REPAIR OF LACERATED EYES

BY

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This article may be looked upon as a plea for the saving of a damaged eyeball. I hope it will appeal to all surgeons, whether ophthalmic or general.

Many of those who are injured as the result of air raids are found to be suffering from lacerated injuries, as in the recent case of a man aged 50 who had both eyes slashed across with flying glass. The left eye was literally in ribbons and had to be removed, but the right eye showed a horizontal cut across the cornea from limbus to limbus. The edges of the wound were fairly well opposed. This condition is often found among the civilian wounded, and the requisite operation should present no difficulties to an ophthalmic surgeon. The general surgeon, however, is often tempted to remove such an eye. Instead the following procedure—known as Kuntze's operation—is recommended.

Operative Procedure

The skin of the eyelids, forehead, nose, and cheeks is carefully cleansed, preferably with merthiolate solution No. 45 (P.D.), 1 in 4,000. The lids are gently held apart by an assistant and lifted from off the eyeball to avoid all pressure and the consequent squeezing out of the contents of the eyeball. A few drops of 5% cocaine and some of the same merthiolate solution are used to clean the conjunctival sac, but washing out should be avoided. On the side nearest to the wound the conjunctiva is picked up and cut with scissors, thus forming a ribbon (Fig. 1) which can be gently slipped down over the cornea and laid over the length of the corneal wound. At each side the ribbon is held in place by a suture (Fig. 2). Soft ophthalmic boric ointment with 1% atropine is laid inside the eyelids, and both eyes are bandaged to avoid movement. A little ointment may be slipped into each conjunctival sac daily. In four to five days the sutures will cut out, and often the ribbon will retract, showing a

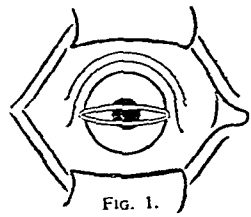


FIG. 1.

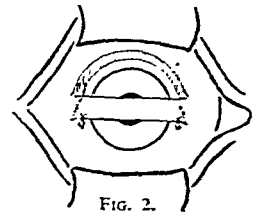


FIG. 2.

healed cornea. If the conjunctiva adheres to the wound this can be gently dissected off a few weeks later. The action of the eyelids helps in the separation of the conjunctiva from the cornea.

In the case mentioned above it was discovered, when the cornea was healed, that the lens capsule had been lacerated and lens matter filled the anterior chamber. This will be removed by a curette evacuation later on.

Sometimes a cornea will not heal, owing either to malposition of the edges of the wound or to the fact that the wound edges are not sharply linear. Here the procedure is the same at first as that already mentioned. Pressure of the eyelids on the damaged eyeball must not be allowed. A narrow strip of conjunctiva is again dissected more or less parallel with the wound. Using Traquair's conjunctival suture forceps—an instrument with a small horseshoe at the end of each prong (Fig. 3)—the edge of the corneal wound can be picked up and a fine needle passed from within outwards

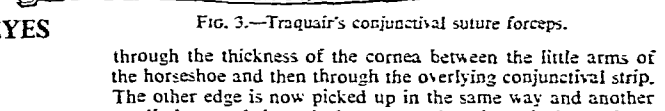


FIG. 3.—Traquair's conjunctival suture forceps.

through the thickness of the cornea between the little arms of the horseshoe and then through the overlying conjunctival strip. The other edge is now picked up in the same way and another needle is passed through the cornea, then through the conjunctival slip, and the suture is tied. (The suture, a 12-inch piece of silk threaded at each end with a fine cutting needle, is made by Messrs. Merson of Edinburgh and is used for corneo-scleral suturing during cataract operations. It bears the author's name. If not available any fine silk—say No. 00 thickness with a No. 5 or 6 squint needle at each end—will do.) The overlying vascular slip helps the avascular cornea to repair, and thus the eye can be saved. It should be mentioned that protruding iris should be gently caught up and cut away. To avoid pressure on the eyeball Arruga's speculum should

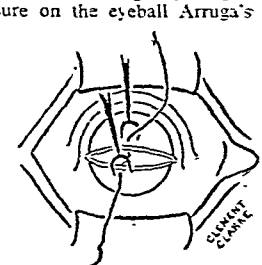


FIG. 4.

be used. This is better than using Desmarre's separate lid retractors.

The final stage of the operation, depicted by Fig. 4, is the same as Fig. 2, but instead of a suture at each end of the slip the suture will be in the middle of the slip but not quite in the centre of the pupillary area.

The largest wound of the eye ever repaired by me was a transverse cut across the cornea and as far again through the sclera. Another case was that of a machinist who was cutting tin. A strip flew out of the machine and cut the

woman's eye from the inner canthus to the outer. She had the wit not to squeeze, but just held her eyes shut. The wound, treated as above, healed, and it was then found the lens had not been touched. In spite of some lost iris she retained good vision and was able to start work again.

Clinical Memoranda

Albinism: Observations in Two Native Seychelles Families

Among many peculiarities in Nature's constructions is albinism. This subject is of some special interest, as it is seen not only in mankind but also in animals. The following observations were made on two native families in Mahé, Seychelles Archipelago, situated in the middle of the wide expanse of the Indian Ocean.

Family A.—Of this family of eight, six members are pure albinos. The father is an albino, the mother a pure negress. The first five children are albinos, the sixth a pure negress. The father is the son of a pure Frenchman from Réunion and a pure negress (a Malgache) from Madagascar. Whereas

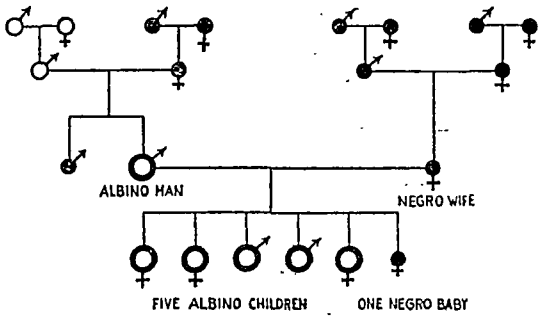


FIG. 1.—Showing genealogy of Family A. The white circles represent Europeans; the black circles, negroes and negresses; and the black circles with white centres, albinos.

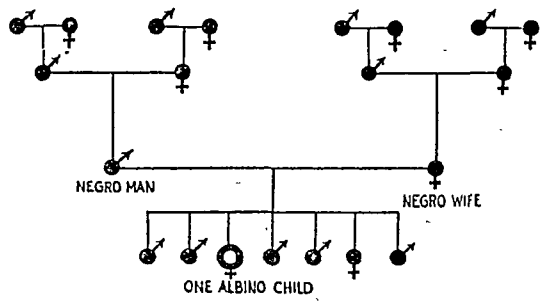


FIG. 2.—Showing genealogy of Family B. The black circles represent negroes and negresses; and the black circle with white centre, an albino.

he was born an albino, his only brother is purely negroid; so far as can be ascertained this brother has no children. His grandparents were pure French on his father's side but pure Malgache of Madagascar on his mother's side. His wife, a negress, is a descendant of a pure negroid stock from Africa. She and her youngest baby appear to be normal in all characteristics.

Family B.—This is a family of nine, being father, mother, and seven children, of whom the third is a pure albino. The entire ancestry consists of pure African negroid stocks, without any albino whatsoever. In this albino child all the typical characteristics seen are similar to those observed in Family A. The parents and other children are normally negroid in all characteristics.

These albinos show certain marked features. There is complete absence of pigment in the skin, the hair, and the eyes. The skin is extremely white, unrelieved by the slightest tint of red from exposure to strong sunlight. The hair is curly, of the negroid type but rather fine, and this is uniformly seen all over the body in all the above cases. The pupil shows a red tint, and the iris surrounding it has a pale rosy colour. Bilateral nystagmus is present in all cases, as also is photophobia. They cannot tolerate strong light, and when asked to face sunlight they close the eyes at once. Myopia, too, is pronounced in these cases, and large letters are discerned to any degree of clarity only at about four to five inches distant. When they are out walking the face and eyes are turned downwards.

Albinism is a congenital anomaly consisting of a remarkable peculiarity in the physical constitution of certain individuals. The Portuguese, who recorded their findings among the negroes of West Africa, called the persons so affected "albinos." The pigment defect has been observed both in the white and in the black races of mankind. It is most common and most pronounced in the negro and Indian races. It has also been encountered in the lower animals, among which are found the white monkey, the albino crow, robin, and opossum, the white hare, and the so-called white elephant, which is regarded with veneration by some Eastern nations.

In these native Seychelles families no mental defect is observed except a slow mental response. The powers of procreation appear to be unaffected. In Family A five albino



FIG. 3.—Family A.



FIG. 4.—Family B.

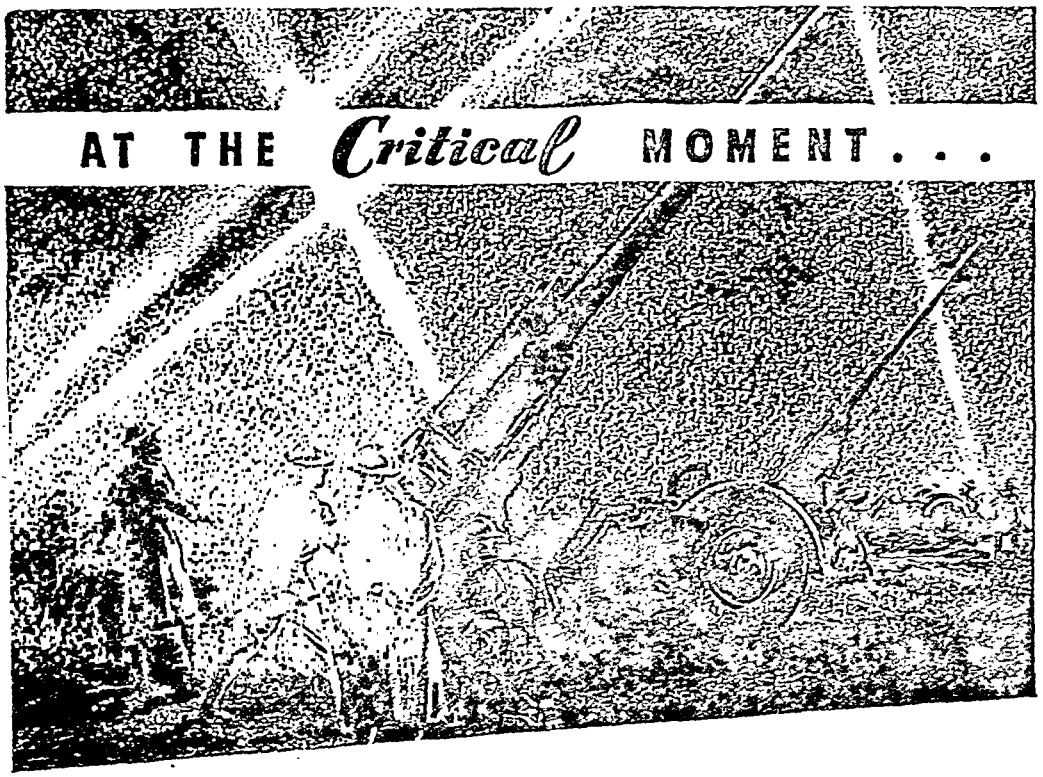
children are born from an albino father, a condition considered to be of great rarity. In Family B the birth of an albino child to negroid parents seems to be more compatible with the usual observations.

Consanguinity and heredity have been noted among the alleged causes of albinism, but its aetiology is obscure. Can it be due to a fault in the endocrine system, a break or absence of a hormone in the chain which regulates the colouring matter in the skin, hair, and eyes? Is it some defect in the suprarenal gland or in the posterior pituitary gland? In fact, what is it?

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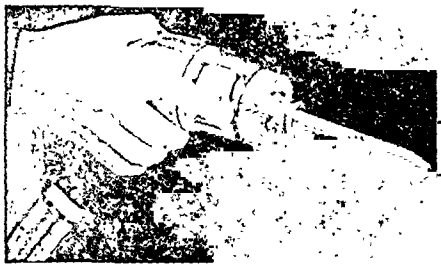
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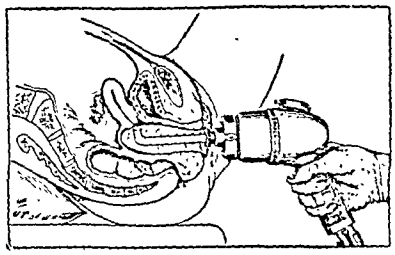
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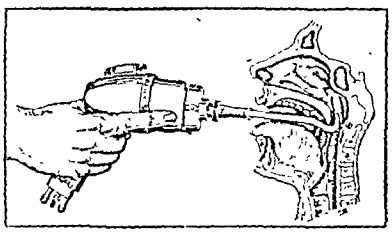
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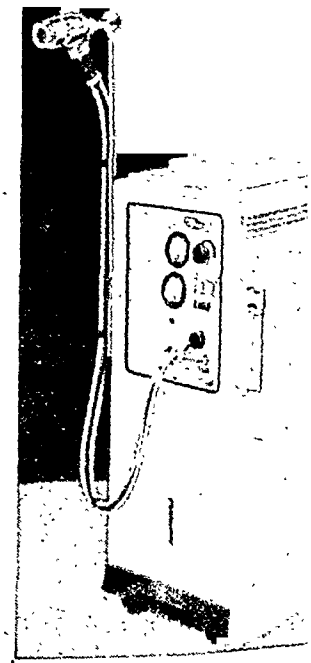
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Reviews

BONE GRAFT SURGERY

Bone Graft Surgery in Disease, Injury and Deformity. By Fred H. Albee, M.D., LL.D., Sc.D., F.A.C.S., F.I.C.S. Assisted by Alexander Kushner, M.D., B.Sc. (Pp. 404; illustrated. 35s. net.) New York and London: D. Appleton-Century Company.

This book is an authoritative and comprehensive exposition of the principles and technique of bone graft surgery embodying the author's technical methods and the experience he has gained in the treatment and follow-up of over 6,000 cases.

In his opening chapter on general principles Dr. Albee lays stress on the complete re-vascularization of the graft by the growth of blood vessels from the host into its Haversian canals which was demonstrated in 1929 in post-mortem specimens specially prepared and injected by Sir Arthur Keith and preserved in the Museum of the Royal College of Surgeons. The author believes that increased blood supply to the diseased tissues via the re-vascularized graft is one of the underlying causes of the beneficial action of the graft in tuberculosis of the spine. From this follows the extreme importance of including all the layers of bone in the graft and of bringing these into as accurate coaptation as possible with the corresponding layers of the host, best accomplished by the inlay graft, which is, generally speaking, the most desirable form of grafting. The author does not approve of either intramedullary or osteo-periosteal grafts. For the latter he substitutes "sliver grafts" which are cut very thin but include all the layers of the donor bone. All graft material that is not autogenous is rightly condemned.

After a chapter devoted to armamentarium, in which he insists upon the necessity for special tools for such specialized work as bone graft surgery and describes his own outfit and specially designed operating table, Dr. Albee passes on to a consideration of spinal fusion, with which his name is particularly associated. This chapter contains a full description of his technique of inlay grafting for spinal tuberculosis, and the text is illuminated by numerous diagrams and line drawings. Dr. Albee is so firm a believer in the benefits of spinal fusion that he performs it for a large variety of spinal conditions besides tuberculosis, for some of which—as, for instance, vertebral eriphysitis and osteochondritis in adolescents—the operation is not commonly performed in this country. In cases of tuberculosis he is a warm advocate of spinal fusion as early as possible in progressive disease in both children and adults. With this, though he makes out a good case in support of his views, he will not meet with universal agreement, especially in this country, where the tendency has always been towards conservatism in the case of children; only specially selected cases are, as a rule, submitted to fusion operation. Even in adult spinal tuberculosis some doubt has recently been cast on the necessity for fusion in every case, notably by Seddon, who analysed carefully a number of cases treated at Stanmore and came to the conclusion that the end-results of cases treated conservatively throughout were no worse than of those treated operatively, and that the time factor was not materially shortened in the latter cases. The unqualified statement, in another part of this chapter, that tuberculosis of the sacro-iliac joint is the most fatal of all joint affections does not accord with experience in this country, and here again Seddon has shown that the results of fusion operations in uncomplicated cases are not superior to those of conservative treatment only. Most surgeons would agree with Dr. Albee in advocating spinal fusion operations in scoliosis, in certain cases of vertebral fracture, and in spondylolisthesis.

In the chapter on hip-joint surgery the author hardly gives sufficient credit to the Smith-Petersen pin in the treatment of fresh fractures of the femoral neck, and few surgeons in this country would agree that the autogenous bone peg is the treatment of choice in these cases, except where open reduction is not considered wise. Nailing these fractures without open reduction is now a firmly established method, and is giving a high percentage of union, failures being due, in most instances, to faulty technique rather than to faulty selection of cases. In cases of non-union, however, the autogenous bone peg is of undoubted value. The important operation of arthrodesis of the hip is fully described, and both here and throughout the book the author, while naturally giving prominence to his own methods, also describes or gives in schematic form alternative techniques designed by other well-known surgeons. His relatively new and important contribution to the treatment of paralytic hip conditions by elongation of the kinesiological lever at the top of the femur is described in this chapter.

In the remaining chapters, on bone graft surgery for ununited fractures, for replacement of bone, plastic bone graft surgery, and arthrodesing and bone block graft operations, the author's mechanical genius has full play, especially in those on ununited fractures and plastic procedures. This is Dr. Albee at his best, and careful study of these clearly described and well-illustrated procedures will certainly repay any surgeon who is interested in this branch of surgery. The book throughout is generously illustrated with radiographic reproductions, and the schemas and line drawings are helpful in clarifying textual descriptions of technical procedures. A full bibliography is appended to each chapter.

PERSONALITY AND INSTINCTS OF ANIMALS

The Personality of Animals. By H. Munro Fox, F.R.S., Professor of Zoology, University of Birmingham. Pelican Books A. 78. (Pp. 124. 6d.) Harmondsworth: Penguin Books, Ltd.

Until comparatively recent times the study of zoology was divided between the morphologist and the field naturalist, who exchanged few contacts. Some twenty to thirty years ago a school of experimental zoology arose which has studied animal life under rigidly controlled scientific conditions. In this entertaining little book, free from the anthropomorphism to which animal lovers are so prone, Prof. Munro Fox has given a popular account of some of the results obtained thereby. We learn that fishes can not only hear but can discriminate between sounds if not less than an octave apart; that a dog's perception of sound includes notes of much higher pitch and is not only ten times as acute as ours but in discriminating the source of a sound is also twice as accurate. We are told that bees can see blue but not red, while they can see ultra-violet rays; hens can see blue but not violet; pigeons can see the red end of the spectrum better than the further end; while cats and dogs are colour-blind. But if animals have poorer colour discrimination than we have, their sense of smell and of position are far more accurate. There is an entertaining chapter entitled "Do Animals Count?" which suggests that the more intelligent ones can count up to five but not beyond, as well as a fascinating description of the way in which a bee's sense of time can be accelerated by thyroid and delayed by quinine. The importance of the hormonal drive in directing instincts is emphasized. Through such information we are skilfully led to realize how differently our world appears to animals. The author reaches the conclusion that those animals

which have fewest instincts possess most personality, for then each individual in its lifetime accumulates a different store of experience on which it acts; each individual is different from its neighbours. Mammals, and more particularly man, have fewest instincts and therefore have the greatest degree of personality.

PHARMACOLOGY AND THERAPEUTICS

Poulsson's Textbook of Pharmacology and Therapeutics. Edited and revised by Stanley Alstead, M.D., M.R.C.P. Third edition, with new appendix. (Pp. 558. 21s. net.) London: William Heinemann (Medical Books) Ltd. 1940.

The third English edition of *Poulsson's Textbook of Pharmacology and Therapeutics* is edited by Dr. Stanley Alstead. It is only two years since the last edition appeared, and the chief change in the present volume is the addition of an appendix which contains an account of the sulphonamide drugs and a summary of the more important monographs in the Second Addendum (1940) to the *British Pharmacopoeia*, 1932.

The publishers state that the exigencies of the time have prevented a complete revision of the text. This is evident in certain sections. For example, the vitamins are dealt with in little more than a page, and the text suggests that the chemical constitutions of most members of this group are still unknown. We found no mention of vitamin K. The sex hormones occupy only half a page, and no mention is made of the existence of synthetic oestrogens. In the chapter on the thyroid the isolation of thyroxine by Kendall is mentioned but no account is given of the subsequent work on the chemistry of thyroxine. These examples could be multiplied, and we feel it necessary to mention them because the textbook is intended for use by students, and a student who relied upon it for information concerning certain recent pharmacological advances might find himself in difficulties in an examination.

STATISTICAL CALCULATIONS

Statistical Calculation for Beginners. By E. G. Chambers, M.A., Assistant Director of Research in Industrial Psychology, Cambridge; Fellow of the Royal Statistical Society. (Pp. 110. 7s. 6d. net.) Cambridge: The University Press. 1940.

The object of Mr. Chambers in writing this book was to provide field and laboratory workers, especially those doing psychological work, with explicit instructions as to the calculation of the various statistical indices necessary to describe their results, interpret them, and measure their significance. Mr. Chambers has, we think, succeeded; any docile and industrious student who obeys the instructions will reach precise results. Whether a perusal of the book is likely to fire an ordinary reader's enthusiasm for statistical research is another matter. Mr. Chambers has perhaps kept a little too strictly to the terms of reference he gave himself. It is true that proofs of the methods the arithmetic of which he describes are (as he says with a rather irritating frequency) often difficult. It is equally true that the principles involved can usually be explained without mathematical symbolism. To take a simple example, to *prove* that the limit of the binomial distribution of "heads and tails" is a "normal" curve is a rather difficult piece of algebra. But any intelligent person with a pencil and piece of paper can convince himself, by trying out the possibilities of 2, 3, 4, 5, or more tosses, that the graph *does* become smoother and smoother, and will be more willing to take on trust the proof that the "curve" to which he is gradually approximating has such or such an "equation."

The student will find the manual of much practical use if he first reads, fairly quickly, some general book on statistical principles.

Notes on Books

The American Gynecological Society was founded in the year 1876, and the sixty-fifth volume of its *Transactions*, edited by Dr. Richard W. Te Linde, has been published at St. Louis by the C. V. Mosby Company. This comprises the presidential address delivered by Dr. Fred L. Adair, and seventeen papers reprinted from the *American Journal of Obstetrics and Gynecology* with reports of the discussions that followed them. Three of the papers are on obstetrical subjects, the remainder being gynaecological. The papers and reports are preceded by official information, and followed by five memorial notices of deceased Fellows. The British Honorary Fellows of the American Gynecological Society are, in order of their election, Herbert R. Spencer, J. Munro Kerr, T. Watts Eden, W. Fletcher Shaw, Victor Bonney, and Eardley Holland; and the names of seventeen of their fellow-countrymen are recorded in the list of deceased Honorary Fellows.

The second edition of Dr. E. E. CLAXTON'S clear and useful book on weight reduction contains very few alterations, but a war appendix has been added, consisting of two pages only, on vitamins. May the day soon come when this book will be wanted again, because in the meantime war conditions provide all the weight reduction needed in most cases. Its full title is *Weight Reduction: Diet and Dishes. With Tables and Recipes Suitable for Diabetics;* the publishers are William Heinemann (Medical Books) Ltd., and the price is 8s. 6d.

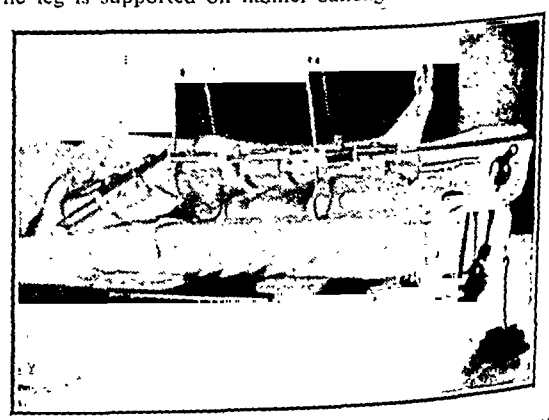
Preparations and Appliances

A THOMAS SPLINT MODIFIED TO BRAUN'S TYPE

Mr. J. C. R. HINDENACH, M.D.N.Z., F.R.C.S., writes:

Those of us who had to shift at a few days' notice from a well-equipped London hospital to a sector hospital stocked from Government stores have often bemoaned the lack of appliances to which we had been accustomed. Among others, Braun's splint, so useful in the treatment of certain fractures of the tibia, was not supplied. However, the Government issues of a Thomas splint, two footpieces, and a bed-pulley and clamp can be, to some extent, adjusted to make up for this loss. The photograph is almost self-explanatory.

A Thomas splint, with padded ring, is bent at the knee. The leg is supported on flannel bandages held with clips and



safety-pins. Extension is obtained through skin strapping or a Kirschner wire through the os calcis or lower end of the tibia. Support to the splint is given by using two footpieces suitably spaced along its length. These should rest on a board in the bed. Fracture boards are placed under the distal half of the mattress, enabling the ring of the splint to sink into the bed. If this does not occur the lower half of the ring will tilt the splint. If the footpieces are reversed to overcome this and raise the splint it is found that the pulley-clamp at the end of the bed cannot be lengthened and the traction pull will not then be horizontal.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY APRIL 12 1941

MEDICAL MAN-POWER

ıe needs of the fighting Services, of the expanding ır industries, and of agriculture are being met by the ıbsorption of men and women who have abandoned craft in which they had acquired skill and by what called dilution. In the economic ups and downs of ıde men and women pass from one occupation to ıother in which they can make a better living, so that ere is some reserve of workers with experience in a ırticular industry who are not employed in it at any ıe time. It is augmented by a very large number of ıined women who have married and ceased to follow eir premarital occupation. All these can be, and e being, drawn upon for the wartime reorganization industry. Some of them require re-education, but is in connexion with dilution that intensive training imperative as a substitute for the usual long apprenceship to a craft. The nursing profession, in which ıortage had become acute before the war, has been ıbjected to both these processes, non-registered nurses eing supplemented by assistant nurses and nursing ıxiliaries who have been given a brief course of train-ıg, while many fully or partially trained married ırses have returned to the service in a whole-time r part-time capacity for the duration of the war. heir salaries and conditions of service are being imroved in order to accelerate these processes.

The position in the medical profession is differnt. Men rarely leave it for other walks of life. ome retire with advancing age. Many medical omen continue to practise after marriage. The eserves are therefore small. Both men and women ho had given up the practice of medicine for the bove or for other reasons have returned, but their ıumbers are insufficient to ease the situation greatly.)n the other hand the possibilities of dilution in a proession which requires so long and arduous a training re limited, though they do exist. The large drain on nedical personnel created by the essential demands of he fighting Services has therefore to be balanced mainly)y those left in civil practice bearing a heavier burden. t was to consider this situation that the Robinson Committee was appointed last December at the urgent equest of the Central Medical War Committee, and ı recent circular of the Ministry of Health to local ıuthorities and voluntary hospitals may be regarded ıs the first patent response to its recommendations.[1] The calls of the Services have been great, and it is good to know that they are now reviewing their medical establishments so as to reduce them as far as possible. The Ministry of Health is also reconsidering the staff engaged in the Emergency Medical Service with a view to its reduction and replacement to some extent by foreign practitioners. Similar action is urged upon civil hospital managers, the suggestion being made, for instance, that where two Class A and two Class B2 officers are engaged in a hospital the number might be reduced to one or two of Class A and one Class B2 without serious loss of efficiency. They, too, are asked to give favourable consideration to the replacement of a certain number of British practitioners by those of foreign nationality. An important suggestion is that the resident staffs of hospitals should be pooled to a certain extent, presumably within a hospital region, so that hospitals which cannot in present circumstances be staffed up to the optimum standard may obtain temporary relief at times of stress from others less embarrassed. The Ministry further indicates that the time has now come to release junior house officers by replacing them with senior students in their final year of study, as in the last war. They should, however, be employed only in hospitals where they remain under supervision by members of the teaching staffs of their medical schools. They should usually be appointed for three months only and should constitute not more than 50% of the resident staff. For the purposes of the Emergency Hospital Scheme salaries will be recognized at the rate of £50 a year, with board and lodging (not exceeding in value £100 a year). As regards the medical staffs of health departments who are not engaged in hospital duties, the Ministry urges the maximum of economy without prejudice to essential services. Women, for instance, may well replace men engaged in maternity and child welfare work, and part-time assistance by general practitioners over military age who can afford time from their private practices might be utilized to release young whole-time medical officers. Economy in the use of administrative medical officers may be effected by combining areas and relieving medical men so employed of work of an administrative and clerical nature which could quite well be done by lay officers.

If these proposals are energetically taken up by the several responsible bodies they should do something to relieve the present situation, although they might very well have come sooner. The excellent suggestion to employ medical students in hospitals, for instance, has reached hospitals and medical schools at a time when final-year students are nearing their examinations and are therefore most likely to be thrown out of their academic stride if they devote themselves assiduously to the new routine hospital duties to which they will be suddenly called. Fortunately some medical schools, notably Liverpool, have already moved far in this direction of their own volition. The effect of this and the other proposals will depend largely on the appreciation by all concerned of the fact that services of any kind cannot be staffed at an optimum level at the present time. Above all, the action taken as to their establishments by the fighting Services will be awaited with interest and some anxiety. It is their great demand that has created the difficulties in the medical profession, which was not overstocked before the war, and something more than their own assurance is required to convince us that they are approaching reorganization of their medical staffs with a realization of the shortage in civil life. To a certain extent the same comment applies to emergency and other civil

[1] Ministry of Health. Circular 2323, March 28, 1941. See this week's *Supplement*.

hospitals, and the public health service. It is perhaps natural that senior medical officers and honorary staffs should be reluctant to release house officers who appear to them to be essential to the efficient performance of both the emergency duties cast upon them and also their ordinary civilian work. But the effect so far has been to deplete general practice disproportionately. The crux of the situation is contained in these sentences of the circular: "Private practice has already been seriously affected by the recruitment of practitioners of military age, and if a fair balance is to be preserved and essential medical services carried on, other branches of medical practice ought to make further contributions to the Armed Forces." As final comment it may be repeated that the Armed Forces themselves can also make a contribution to the solution of this complex problem.

PROBLEMS IN WOUND HEALING

The healing of wounds was considered at a recent meeting of the Medical Society of London, and an account of the discussion appears at page 568. The time is opportune for a brief survey of this important question. The surgeon's work rests upon the fundamental assumption that wounds will heal provided certain relatively simple conditions are fulfilled. This inherent tendency to healing and repair is so marked a characteristic of damaged living tissue that it has led to a comparative neglect of many of the underlying and determining biological factors. The wounds may be accidental or surgical, clean or infected; they may be wounds of civil life or wounds of warfare. Yet in the absence of some overwhelming disaster such as serious shock, haemorrhage, or infection, Nature can be relied upon to make the most strenuous efforts to repair these breaches of her tissues however they have been inflicted. And if, in Pirogoff's words, we consider war as a "traumatic epidemic," and under modern conditions an epidemic that knows no frontiers, then a time of war must be a special one for the study of the problems of wound healing. Why then has the subject been so neglected? First, because the whole of surgical technique assumes the potentialities of wound healing, as in the absence of these all surgery would be impossible. Secondly, the more detailed study of wound healing has been dependent on a whole host of ancillary developments all having some bearing upon the processes of tissue repair: on surgical technique, asepsis, and bacteriology; on the effects of various suture and ligature materials in wounds; on biochemistry and the knowledge of specific growth stimulants; and finally on the ramifications of the more recent knowledge of nutrition. The advances in all these directions have done, and are still doing, much to elucidate the mysteries of wound healing. The words of Ambroise Paré are as true to-day as when he used them to conclude his case records, "I dressed him and God healed him." The greater our knowledge of the processes of wound healing, the greater the need for the surgeon to see the therapeutic implications of this knowledge. The patient must be made safe not only for the actual operation but also for the whole course of repair of his injury.

The subject may be approached by many ways, but all lead in the same direction. In war it is inevitable that the question of infection should be uppermost in our minds and therefore claim our first consideration. Infection is the greatest enemy of wound healing. But although we know that the elimination of bacterial infection is the first step in securing the healing of a wound, infected wounds do not always provide the best material for the study of those factors which promote healing. These wounds are such complicated battlegrounds between offence and defence, between destructive and reparative forces, that they make difficult any detailed analysis of the various elements in repair processes. On the other hand, the conclusions drawn from a study of experimental wounds in animals cannot always be directly applied to human beings. But in addition to these two types of wounds there are those produced by the surgeon in an attempt to rid the body of some disease process, and a study of these may go far to illuminate the processes of repair.

Much of the more recent work on wound healing has come from America, and much of it has been concerned with biochemical and nutritional aspects. At the same time much has been learnt from the failures of normal wound healing, from the cases in which for one reason or another the expected results have not been achieved. The conditions which lead to failure in wound healing may thus indirectly shed much light on the conditions which are the prerequisites of success. Whipple[1] has recently reviewed the whole subject, especially from the standpoint of the lag or latent period in the development of healing. His work shows that wound healing is an orderly biological process which conforms in general to the laws of growth. In the individual wound the three most important processes are the amoeboid movement of cells, their mitotic proliferation, and the maturation of cells engaged in the fusion of wound surfaces. The local factors which determine the reparative processes depend upon the amount of damaged tissue in the wound, the vascularity and the integrity of the blood supply to the damaged tissues, the nature of the exudate in the wound space and adjacent tissues, the number and character of the local infecting organisms, and the number and character of the local foreign bodies to be encapsuled or extruded. But these purely local conditions are far from being the only ones of import. The more general factors include the age of the tissue (whether adolescent, adult, or senescent), the state of hydration, the state of nutrition (especially in relation to protein and to antecedent loss of weight), the vitamin balance, and the state of the general circulation and the blood. Orderly and normal wound healing is thus dependent upon a close interrelationship between local and systemic factors. Experiment has confirmed the view of experience that age is a factor of great significance. Experiment has demonstrated that departures from the normal electrolytic and protein balance delay the processes of healing. Vitamin C is now known to play an important part in the formation of collagen fibres in wounds, and vitamin K in the production of prothrombin and so in the control of haemorrhage. Circulatory efficiency and the state

[1] *Ann. Surg.*, 1940, 112, 481.

of the blood may determine not only the immediate outcome of the operation but also the speed of the repair processes.

The subject of wound healing may also be looked at in another way. What, for example, are the conditions that determine the breakdown or dehiscence of surgical wounds which might be expected to heal by first intention? Sokolov[2] has reviewed and analysed the factors in the disruption of abdominal wounds in 732 cases. This phenomenon was twice as common in men as in women, and commoner in the first half of the year than in the second (this was thought to be due to a lowering of the vitamin C content of the tissues); it occurred especially between the ages of 40 and 60, in association with emaciation, in the presence of malignant disease, or in association with operations on the stomach or intestinal tract; and, finally, the wounds which broke down were usually not infected. The figures quoted by Sokolov revealed that wound disruption took place in 2 to 3% of all abdominal cases. Other workers have arrived at similar results and conclusions, and all have stressed the fact that failure of the healing process is most likely to arise in patients suffering from gastro-intestinal disease. In reporting the post-mortem findings in a series of cases after partial gastrectomy Payne[3] stressed the fact that in a considerable proportion of these the fatal outcome was associated with an almost complete lack of response at the site of the anastomosis. Studley[4] has also shown that the mortality in operations for peptic ulceration is directly proportional to the antecedent loss of weight. The general nutrition of the surgical patient is thus inseparably bound up not only with the immediate prognosis of the operation but also with the breakdown or dehiscence of the operative wounds, whether visceral or parietal.

During recent years much work has been done on vitamin C in relation to the healing of wounds. Lanman and Ingalls[5] demonstrated the importance of this in securing normal repair of experimental wounds in guinea-pigs, an observation that has now been confirmed and amplified in a recent paper by Hunt.[6] These experimental studies show that collagen does not form in the healing wounds of guinea-pigs partially deficient in vitamin C; the proliferating mesodermal cells fail to mature, and the healing of the whole wound is profoundly disturbed. In a series of twenty-eight human cases investigated post mortem and reported by Hunt there was a comparable histological picture in eight, and in five there was disruption of the abdominal wound, and in three leakage at the gastro-intestinal suture line. It seems clear, therefore, that a subscurvy state leads to a gross disorganization of the whole orderly process of wound healing, and supports the view that the same deficiency may lead to failure of wound healing or even to wound disruption in human beings after surgical operations. This work has recently been confirmed by Fox[7] in a paper on experimental human scurvy.

[2] *Vestnik chir.*, 1931, 65–63, 219; *Internat. Abstr. Surg.*, 1932, 55, 157; *Erzebn. Chir. orthop.*, 1932, 25, 366.
[3] *St. Bart's Hosp. Rep.*, 1935, 69, 191.
[4] *J. Amer. med. Ass.*, 1936, 105, 458.
[5] *Ann. Surg.*, 1937, 105, 616.
[6] *Brit. J. Surg.*, 1941, 28, 436.
[7] *British Medical Journal*, 1941, 1, 311.

The general nutritional state of the surgical patient is of course only one aspect of the problem of wound healing, but it is one which in this country has been largely neglected. Clinical and laboratory evidence, however, both show that in the presence of important nutritional defects the normal sequence of events in healing does not take place, that the processes of repair may be seriously delayed or retarded, that the risks of complications from the non-healing of visceral surfaces are greatly increased, and that breakdown of a wound is likely to happen. And for every wound in which there is some serious departure from normal healing there are probably many more in which some minor disturbance occurs and may prolong the patient's stay in hospital and retard his ultimate recovery. Behind every wound there is the nutritional state of the individual patient against which all the reparative processes of Nature must operate. A nutritional disturbance may result from the patient's disease or be independent of it; it may be directly due to some gastro-intestinal lesion; or the lesion may reside in a background of poor wages, inadequate food, bad housing, or ignorance of personal hygiene. It is not difficult to remember that a surgical wound will not heal in the presence of a foreign body, but it is easy to overlook the fact that delays in healing, or even non-healing or disruption, may perhaps be due to years of poverty and malnutrition.

The surgeon, in fact, must look beyond the neat incision he makes in the patient's flesh to the social and economic position of the patient as a human being. He might well, too, look more closely into the question of hospital dietary. Tradition and the steward still so often combine to provide the patient with a diet that has little to recommend it apart from its calorie content. Every surgical patient presents an individual nutritional problem, and the help of the expert dietitian should be the rule and not the exception. A serious burn or a major abdominal or other operation is as much an acute nutritional problem as the management of diabetes is a chronic problem. To heal the burn or to repair the damage after the surgical operation will require first-class building materials, without which local dressings and careful surgical technique will be of little avail.

MODERN TROGLODYTISM

Those who sleep in their beds in vulnerable areas are apt to view a little superciliously that large section of the community—now 60,000 in the London Tubes alone (it was three times as numerous last September)—who nightly, air raid or no air raid, seek communal shelter and go to their bunks with the same air of rightful occupation as hotel guests go to their rooms. Lord Horder, in his address to the Royal Society of Arts on April 2, made a chivalrous defence of the modern troglodyte. He said that it was one of his regrets that in "this shelter business" there had been no time to make an extensive census on psychological lines in some of the large shelters, not merely to show where the people came from but exactly why they were there. Some were there because they had been bombed out of their homes, some because their homes were not protected, but there were many others who, for one reason or another, were unable to stand up to the terror of the "blitz" and the noise

incident to it. No priggishness should enter into this matter. After all, most of these people worked by day, and sleep was essential to all work. Many comments had been made on the queer places and attitudes in which these folk got their sleep, and upon their patience and good humour in beastly surroundings. But did it all mean that there was only too little difference between their nights in the large public shelters and their nights in their own homes? It was a terrible indictment of the social system that the shelter conditions which it had now been possible to establish should represent for these fellow-citizens of ours something better and happier than they had known before. That it should have needed a war and life underground for half the twenty-four hours to achieve a result which was bringing joy to the hearts of social workers was a humiliating thought. One other good thing was emerging from this experience. The mood of these shelterers was extremely plastic, so that among them there was a field for health education the like of which had never existed before. They had, and they appreciated, their medical aid. Mothers submitted to the shelter doctor's persuasive argument about diphtheria immunization when a visit to the clinic for this purpose would never have been made. The nurse was listened to with attention, and her ministrations gratefully received. Here was field work of the best kind in preventive medicine. Lord Horder also commented on the obstinate good health of the shelter population, and indeed of the whole community both above and below ground. The situation which arose last September seemed to be full of alarming hygienic hazards. There was gross overcrowding, and it was at that time nobody's job so to condition these places as to make them fit for habitation. The onus was eventually accepted by the local authorities—and Lord Horder paid a tribute to the borough medical officers of health, who had been key men in the situation throughout—but there was a tiresome lag before the recommendations of the advisory committee were carried into effect. Yet the anticipated epidemics and illnesses did not arrive. Even lice and bugs had been difficult to find. In the country as a whole there had been only as much diphtheria as the people deserved, seeing that they would not have their children immunized; the usual seasonal outbreak of measles had not been of a virulent kind; the influenza curve had reached a level which could hardly be dignified as epidemic; only cerebrospinal fever had shown an increase, but the figure was not alarming. Public authorities were puzzled to find the reason for the robustness of the public health. He had even heard that a small committee was being formed to inquire into it. Was it due to a better state of nutrition, or to greater dispersal of the population, or, where shelterers were concerned, to the fact that many of them had been living under better conditions than in their own homes, with more fresh air, less heated atmospheres, and more regular exercise? There were, of course, unknown elements in the very determination of epidemics, and the causes of a rise or fall in the virulence of a bacterium or a virus were unknown to us. But, however it might be, "shelter disease" as such had not appeared. Dr. W. A. Daley, medical officer of health to the London County Council, who presided at Lord Horder's lecture, said that in London during the first three months of 1940 there were 4,393 deaths from influenza, pneumonia, and bronchitis, and in the corresponding period of this year only 3,089, and even allowing for the decreased child population of London the cases of scarlet fever and measles had been relatively few. But the danger was still there, the good fortune experienced during a winter past could not be predicted of a winter to come, and vigilance must be sustained.

DERMATOMYOSITIS

This rare and interesting disease has been recognized for a good many years. It is characterized by hardening and atrophy of the muscles, and the skin is always affected to some degree, either by an eruption resembling lupus erythematosus or by the development of thickened and hardened areas of integument closely resembling scleroderma. Most of the workers who described the earlier recorded cases insisted on the necessity for and difficulty of diagnosing it from sclerodermia, but at a discussion held on it at the last annual meeting of the British Association of Dermatology considerable support was forthcoming for the view that dermatomyositis and sclerodermia are really the same disease, although they must both be differentiated from poikilodermia atrophicans. Furthermore, a good deal of evidence was brought forward to show that the condition is intimately associated with thyrotoxicosis. The question was attacked from clinical, histological, and biochemical aspects. Dowling pointed out that in every case of dermatomyositis superficial sclerodermatous changes are seen, and he also drew attention to the striking similarity in the course of the two conditions. He is by no means the first observer to attempt to establish the identity of dermatomyositis with sclerodermia, for Oppenheim did so as long ago as 1903. Since then much evidence has been collected in support of his proposition. The relation between this disease and thyrotoxicosis has been emphasized too, but much more recently. The evidence in its favour is partly histological and partly biochemical. One of the most important points is the occurrence of "lymphorrhages" (which are collections of lymph cells) in the muscles both in sclerodermia and in thyrotoxicosis, while in all the recorded necropsies on cases of generalized sclerodermia pathological changes have been found in the thyroid. Fuller details on the histopathological similarities will be found in Freudenthal's paper read at the same meeting, while Griffiths, in discussing the biochemical side of the problem, pointed out that in both conditions creatinuria is well marked. The significance of this symptom seems to be that it is indicative of diminished muscular strength, and it may be associated with loss of power to form glycogen. That this may be so is indicated by the fact that in dermatomyositis less sugar is removed from the blood under the influence of insulin than is the case normally. Still another point of similarity is the occasional occurrence of decalcification of the bones in both conditions, though there is no alteration in the blood calcium or inorganic phosphorus. Our knowledge of metabolism in dermatomyositis is still very imperfect, but we can at least say that the disturbances met with are strikingly similar to those seen in diseases which we know to be of endocrine origin, especially thyrotoxicosis.

GENETICS OF THE HEREDITARY ATAXIAS AND SPASTIC PARAPLEGIA

A few months ago we published[1] an annotation on Dr. Julia Bell's fine monograph[2] on the hereditary ataxias and spastic paraplegia. The monograph covered the literature in great detail, presenting 273 family histories in which more than one case appeared in a family group. In addition, there was a personal collection of forty-six unselected cases, made with the help of Dr. E. A. Carmichael. The relatively brief analysis of the data contained much of neurological and genetical interest, but did not pretend to be exhaustive; actually the results of a more detailed

[1] *British Medical Journal*, 1940, 2, 160.
[2] *Treasury of Human Inheritance*, 1939, 4 (Part III).

examination were promised for the future. An analysis has now been published by Prof. Haldane,[1] and a remarkable discovery has been made: that recessive spastic paraplegia is due to a partially sex-linked gene (which may exist in several allelomorphic forms). Haldane's discovery of partial sex-linkage[2] was a major event in the history of human genetics. Briefly, having satisfied himself by the histological evidence that the X- and Y-chromosomes of man contain a homologous portion which exhibits crossing over, he made a search for corresponding genetic manifestations. In a very short space of time he found three instances in which the evidence for this mode of transmission was very strong (xeroderma pigmentosum, complete colour-blindness, recessive retinitis pigmentosa unaccompanied by deafness), and three in which the evidence was less strong though still good (some cases of dominant retinitis pigmentosa, Oguchi's disease—a form of night-blindness—and recessive, severe epidermolysis bullosa). Unlike the case of ordinary sex-linked inheritance, as in haemophilia, in which the pedigree is striking and highly characteristic, partially sex-linked pedigrees do not differ at all obviously from those of ordinary dominant and recessive cases: and it is unlikely that this mode of transmission would have been discovered without a deliberate search. In essence, a man who has received such a gene from his mother transmits it to more than half his daughters and less than half his sons; the proportions are reversed if he received it from his father. In her monograph Dr. Bell tended to the hypothesis that a genetic unity underlay the group of diseases in question—that is, that one main gene might usually be responsible and that variations between family groups might be due to modifying factors. Haldane's findings do not support this hypothesis (we expressed the same view in our annotation). As already mentioned, the recessive cases of spastic paraplegia show partially sex-linked inheritance, while the dominant cases do not. It is true that there is some evidence of this mode of transmission in the case of Friedreich's ataxia and spastic ataxia, but it can account for a small fraction of cases only. One of Dr. Bell's striking findings was the very strong tendency for members of the same family group to display a characteristic age at onset of the disease. Haldane shows that this cannot be attributed to modifying factors, and that there must be at least three different recessive, sex-linked genes causing spastic paraplegia. He further concludes that it is highly probable that they are allelomorphic—that is, situated at the same locus on the sex-chromosome pair. Many cases are known in plants and animals in which the members of such a series of genes may be presumed to act with different degrees of intensity, and he has himself pointed out a probable instance in man in the case of haemophilia.

LEARNING TO WALK

Several studies of the normal development of the child have already been made by Dr. Myrtle McGraw of New York, and in a recent communication[3] she describes the neuromuscular development of the infant as it learns to walk. She points out that in order to walk independently the child must (*a*) maintain balance in an erect position, and (*b*) propel the body forward by alternate movements of the lower extremities. She first studied the propulsive movements which the child makes before it begins to control balance. Analysing 3,387 observations made on eighty-two children ranging in age from birth to 8 years (two-thirds of the observations were recorded on cinematograph films), she chose seven progressive phases. The first is the "newborn or reflex stepping phase," in which the infant, held under the arms, is in a position of general flexion and frequently makes rhythmical stepping movements. Within a few months comes the "inhibitory or static" phase: the child begins to hold its head more steadily in line with its body, or even extended, and the tendency to reflex stepping is more or less suppressed or inhibited. At the age of about 250 days most children pass into a "transition phase," in which the child moves its body up and down holding its feet still, or, alternatively, stands still and thumps first one foot and then the other up and down. Next comes the "deliberate stepping phase," reached generally by the end of the first year of life, and then the "independent stepping phase," which was attained satisfactorily in 425 days by 77% of the children under observation. The two last phases—namely, "heel-toe progression," and the "integrated or natural phase of erect locomotion," which is characterized by a swinging of the arms in association with movements of the opposite lower extremity—are reached at more indefinite periods. The author shows how these phases support the theory that at birth the infracortical or nuclear portions of the nervous system are dominant, and that later there is a gradual assumption of activity by the cortical levels, a theory which has the support of certain histological studies. Dr. McGraw completes her investigation with a study of the child's attempts to get into an upright position. Here again seven phases were chosen from a mass of detailed data. Phase 1 is essentially passive: if a newborn infant is pulled into a sitting angle and an effort is made to pull it upward there is no co-operative response. After a few months the child shows an incipient urge to push itself upward after it has been pulled into a sitting position; this is the "extensor thrust phase." Next comes the "orthotonic phase," when the child places its feet on the underlying surface and, as it is pulled upwards, extends its lower extremities and attains something of an erect position. In most infants this is reached at about six months, and is followed very shortly by "the vertical posture phase," in which the child will push itself into a leaning position on its feet and then get upright as it brings the shoulder girdle over the pelvic girdle. In the next or "vertical push phase" it begins satisfactorily to co-ordinate the movements of the preceding phase; it pulls itself up by the bars of its cot or some other support, at the same time pushing with its legs. The child, now nearly a year old, has reached "the independent rising phase," in which its movements are a roll from the supine to a prone position and an initial push up with the arms. In the final or "integrated phase" it gets up by way of the sitting position, the complicated succession of movements appearing as one action. Dr. McGraw's detailed studies are not easily reduced to a few lines of description and they suffer in consequence, but those who are interested in this subject will find much of interest in the original article.

[1] *J. Genetics*, 1941, 41, 141.
[2] *Ann. Eugenics*, 1936, 7, 23
[3] *J. Pediat.*, 1940, 17, 747.

At the statutory Comitia of the Royal College of Physicians of London held on Monday, April 7, Sir Charles Wilson was elected President in succession to Sir Robert Hutchison, Bt.

The Central Midwives Board has unanimously re-elected Sir Comyns Berkeley as its Chairman for the year ending March 31, 1942.

SOME AIR-RAID CASUALTY EXPERIENCE

BY

A. M. M. PAYNE, M.B., B.Ch.

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It may be useful to record the work of a casualty clearing station from the point of view of the organizer who is primarily concerned with the smooth running of the hospital and with the provision of facilities for treatment.

Analysis of Cases

In four months 226 air-raid casualties were admitted to the hospital. This number is not large, and if the cases had been evenly distributed throughout the period they could have been dealt with by the normal hospital services. Casualties were received on thirty-two occasions, on only seven of which were the numbers large. The remaining twenty-five occasions contributed a total of 72 cases, the highest individual number being 8. The normal hospital service could have dealt with these. On seven occasions a total of 154 cases were admitted—five times at night, comprising 24, 18, 17, 16, and 13 cases, and twice by day, comprising 38 and 28 cases. It is on these occasions that the organization is tested, since the cases all arrive within a short time, the majority in less than half an hour.

In order to give some idea of their degree of severity the cases may be classified into six groups:

Group I.—Hopeless cases. Multiple open fractures, gross head injuries, and extensive abdominal wounds, with impalpable pulse and unregistrable blood pressure. These patients all died within an hour of admission.

Group II.—Severe injuries requiring resuscitation before operation. Multiple lacerations and open fractures with moderate or severe shock.

Group III.—Severe injuries requiring immediate or early operation. Abdominal perforation and haemorrhage. Shock is usual, but the injury takes precedence.

Group IV.—Moderately severe injuries with little or no shock. Lacerations and fractures with normal blood pressure. Early operation would be safe in these cases, or they could stand some delay.

Group V.—Minor injuries. Abrasions and smaller lacerations without shock, or some shock with little or no injury. Most of these cases could be discharged in a day or two.

Group VI.—Trivial cases which could be discharged instantly if necessary.

The numbers in the various groups were: Group I, 9; II, 38; III, 5; IV, 87; V, 45; VI, 42. On the seven occasions on which larger numbers were received the totals were respectively 8, 31, 4, 59, 30, and 22: as will be noticed, the proportion of serious injuries is higher.

The number of cases taken to the operating theatre was 131, and the operations performed fall into five groups:

1. Orthopaedic, including amputations	61
2. Excision and débridement, including burns ..	60
3. Abdominal perforations	5
4. Head surgery. Depressions or penetrations ..	3
5. Chest wounds	2

The total number of deaths was 33, excluding persons brought in dead, these not being counted in any of the above figures. Eleven patients died after operation; the remainder never recovered sufficiently to be taken to the theatre.

It has been interesting to observe that the incidence of severe injuries is higher in the open than in shelter. Three groups of casualties occurring out of doors comprised 83 cases: Group I, 7; II, 25; III, 4; IV, 36; V, 10; VI, 1. Three groups of casualties sustained indoors totalled 53: Group I, 0; II, 5; III, 0; IV, 13; V, 15; VI, 20. Casualties incurred in the open included a number of cases of compound comminuted fractures of the limbs and penetrating wounds caused by bomb fragments. We have not yet observed any "blast effects." Casualties occurring in houses comprised lacerations, contusions, and fractures, the majority closed, but a few open. Glass produced many bad injuries. A piece was driven into the skull of one man; there have been several cases of damage to the eyes, and a number of severe lacerations of the face.

The general principle that the basement is the safest place seems to be confirmed: unfortunately there may have been many persons trapped in the basements and fatally injured who are not brought to hospital.

First Aid

The first aid rendered before admission to hospital has on the whole been good. There have been two main faults:

1. *Tourniquets.*—These are often applied, but are hardly ever necessary. Stretcher parties should be taught that a tourniquet is to stop bleeding, and that if there is no bleeding, however serious the injury, a tourniquet is not required. The mere fact that there is blood around an injury is not an indication for a tourniquet. In addition, when a tourniquet has been applied it has nearly always been just tight enough to stop the venous return without controlling the arterial bleeding. In effect it was actually increasing fluid loss.

2. *Splints.*—Too many fractures have been brought in unsplinted. The result is great pain to the patient when being moved and an inevitable increase in shock, quite apart from the danger of adding to the local damage. The advantage of splinting is well worth five minutes' delay in bringing the case to hospital. If stretcher parties have not enough splints more should be provided.

I suggest that immediately an incident has occurred causing more than one or two casualties a doctor should be sent to the scene. He could be obtained from the nearest Emergency Medical Service hospital. He would be able to supervise the first aid, especially the points referred to above, and, perhaps even more important, he could give morphine on the spot. Patients have been brought in screaming with the pain of being moved. It may well be that early morphine is as important as warmth to the badly injured. In addition he might be able to send some of the Group V and all Group VI cases to a first-aid post instead of to a casualty clearing hospital.

Transport and Casualty Reception

Each ambulance contains four stretchers. It is most convenient to unload these on to wheeled trolleys and replace with spare blankets and stretchers. There should be at least four trolleys and ten stretcher-bearers—two per trolley and two unloading. It is useful to have two extra bearers in the reception ward to help in lifting the patient on to the bed. Inside the hospital, cases are being taken to the theatres and the wards. As a rule reception is slowing down by the time cases are ready for removal, so that the unloaders can assist. There should be at least three more pairs for transport inside the hospital. It is useful to place canvas stretchers with detachable poles on the reception beds in order to minimize the pain of lifting. Even if this is done all fractures should be splinted before moving. Thomas's knee-splint is most convenient for the lower limb.

It was found early on that the cases should be moved as little as possible and that it was often impossible to assess the severity of the injuries without a complete examination, including the removal of clothing. The patients almost without exception were very brave and would often make light of their injuries, so that it was difficult to find out by questioning where they were injured. A frequent reply was, "Only scratches." "Go and look after someone worse hurt than me." Often the "scratches" turned out to be important injuries. As a result any attempt at preliminary sorting was abandoned and all cases were admitted direct to a reception ward of twenty beds, where they were given heat from an electric cradle as a routine. A reserve ward of twenty beds was similarly equipped. The first inspection is a rapid preliminary round by the registrar or resident medical officer on duty. Morphine and A.T.S. are prescribed, the clothes removed, and the wounds inspected for haemorrhage. All wounds are covered with clean towels to prevent further contamination. The surgeon and physician on duty make a full examination of each case, notes are taken, and intravenous therapy ordered as necessary.

Procedure in Hospital

Transfusions.—Transfusions must be begun as soon as possible. There should be at least six medical officers prepared to start them, and even then all cases may not be dealt with for over an hour. Transfusions on shocked patients are often very difficult, and the assistance of doctors practised in intravenous work is essential. Junior residents will not infrequently be unable to locate a vein through the skin, and cutting down should be done as a routine unless a highly skilled practitioner is present. Completely equipped trolleys, proper lighting, and adequate support for the arm must be provided in each case. We have found cannulae easier to work with than the needle supplied with the Government equipment.

Blood Pressure.—It is of the utmost importance that regular blood-pressure and pulse readings should be kept. One person should be made responsible for this or readings may be missed. The blood-pressure reading has proved the best guide to the patient's condition. An additional supply of sphygmomanometer cuffs that may be left on the patient's arm saves much trouble.

Operation List.—The preparation of an operation list is important and difficult. It cannot be done at once. All that can be achieved until the effects of treatment are noted is the classification of cases as "early," "for resuscitation," or "when convenient." The condition of the patients must be constantly reviewed by someone in close touch with the theatre, preferably a senior surgeon. This is perhaps the most responsible work of all, since so much depends on operating at the optimum time. It should be noted that operations on Group II cases cannot as a rule begin before three to four hours, and that they are often long and tedious. Unless some of the Group IV cases are taken to the theatre early they may not be operated on until as long as twelve hours after their injury. This must increase the danger of infection.

Clerical Staff.—In our hospital two clerks are on duty in the reception ward and take down full particulars of each case for the E.M.S. forms in a hospital casualty record book. Each case is numbered, and clothes and valuables labelled and recorded and placed in a safe. The E.M.S. forms are filled in later from the record book. In this way all information is quickly and permanently available. Further requirements in connexion with the reception ward are: (1) emergency lighting that is independent of the electric mains; (2) a good supply of hot-water bottles (in case of electricity failure); (3) the temperature of the ward must be kept over 70° F.; (4) provision of a portable *x*-ray apparatus; (5) avoidance of overcrowding—only those actively engaged should be allowed in the ward; (6) plenty of hot drinks should be available.

Staffing.—A casualty clearing station must be prepared to treat a large number of casualties at all hours of the day or night with no warning. At the same time, in view of the long periods of inactivity, too many members of the staff must not be interned in the hospital and condemned to idleness and boredom. The classification above shows that there are a very few cases which need urgent operation, a larger number which need resuscitation before operation, and many which need operation sooner or later. Two surgeons on the premises are quite sufficient—one to operate at once if necessary, the other to undertake the difficult task of sorting. Two more surgeons should be on call, one of whom should be within twenty minutes' journey in a car—i.e., he could be fetched in forty minutes in the event of a telephone breakdown. Since nearly half of all operations have been orthopaedic it would be desirable that two of the four surgeons should have had orthopaedic experience. It is essential that one orthopaedic surgeon should be attached to the hospital.

Four operating tables worked simultaneously have been necessary to deal quickly with the larger groups of casualties received. A house-surgeon is required for each, and preferably an anaesthetist for each, although an experienced anaesthetist can supervise two cases simultaneously with a student or nurse to hold the head. One physician must always be on duty. There have been many cases on which a physician's opinion has been indispensable. One of his principal duties is assessing the response to treatment in a shocked case.

Operating Theatres.—Four operating tables are necessary—two in each of two theatres, so that an anaesthetist can supervise two cases. It has not been found necessary to keep trolleys constantly laid out. As soon as casualties are expected instruments are put in the sterilizers and are ready in good time for the early cases. Steam is used for sterilizing, since it is independent of outside power or gas, and can only be put out of action by a direct hit.

Wards.—It has been found to be useful to distribute the casualties after treatment among several wards rather than fill one ward. This lessens the strain on the nursing staff and appears to have no disadvantages. Extra nurses are drafted to the wards according to the numbers admitted. Some additional equipment is required, notably electric cradles and dressing instruments.

The above is a brief report of air-raid casualty work as experienced in our hospital. Various points arising from our experience are mentioned in the hope that they may be of use to others. The experiences of other hospitals would give us much useful information which would improve our organization, and I hope other medical officers will write up their work.

My thanks are due to Mr. C. H. Gray for advice and encouragement, and to Mr. G. Quist for assistance in the classification of casualties.

Nova et Vetera

CENTENARY OF THE PHARMACEUTICAL SOCIETY

The history of the Pharmaceutical Society of Great Britain provides a good example of the value of the union of men whose work in life lies along the same lines and whose duties to the State can be best done when they admit allegiance to a central authority of their own free choice and serve a common cause. A hundred years ago there were many practitioners of pharmacy well equipped by training and knowledge of drugs to make galenical preparations and dispense prescriptions; for it is absurd to suppose that between the highest grade of druggists as represented by William Allen, F.R.S., and the lowest grade as represented by those who added to their occupation the sale of "mops, brooms, bacon, butter, and a thousand articles beside," there was not a large intermediate class of capable dispensers, including a goodly number of apothecaries who preferred shop life to professional life, and the assistants who had been trained by them. Be that as it may, there was no sort of unity among the drug dealers of those days and no means, and little inclination, for the exchange of views and the sharing of experiences, by way of social contact. One interest they all had in common, and that was poaching on the preserves of the physicians, for counter-prescribing was a practice which the Apothecaries Act, 1815, had failed to suppress. It was from this common interest that the bond was woven which eventually united the druggists into a society of their own. It is an old story and need only be told in the briefest outline.

The Father of the Society

In the early part of 1841 a Mr. Hawes introduced in the House of Commons a Bill which sought to make it an offence for any person who was not a qualified doctor to recommend any medicine for the sake of gain. So strongly was this proposal resented by druggists, high and low, that they joined forces to oppose it. The opposition was successful, and on the flood tide of success a few leaders of pharmacy launched a scheme for establishing a permanent organization. A meeting was convened at the Crown and Anchor Tavern in the Strand, and on April 15, 1841, close on the heels of the withdrawal of the Hawes Bill, it was resolved, on the motion of William Allen, seconded by John Bell, "That for the purpose of protecting the permanent interests, and increasing the respectability of chemists and druggists, an Association be

now formed under the title 'Pharmaceutical Society of Great Britain'." Having regard to the high scientific attainments of William Allen, the first president, it is not surprising that plans for establishing a system of education for druggists were started immediately. Allen was a Fellow of the Royal Society who carried on business as a chemist and druggist in Plough Court, Lombard Street; in 1796 he had formed, with several other young men, the Askesian Society for practical scientific research, and three years later he had helped to found the British Mineralogical Society; in 1804 he delivered a course of lectures on natural philosophy at the Royal Institution, and he was for a time lecturer on chemistry and natural philosophy at Guy's Hospital. With such a man as its president there is little wonder that the infant society became imbued with his belief in the value of scientific education and turned to it as a means of raising the practice of pharmacy from the low level at which it stood in those days, so far as the rank and file of the calling were concerned. The wisdom of the Society's first council was soon to be seen, for by the time the organization was two years old Queen Victoria granted it a Royal Charter of Incorporation in which it was declared that the purpose of the Society was the advancement of chemistry and pharmacy and the promotion of a uniform system of education.

Medical Collaboration

As has been seen, the direct cause of the establishment of the Pharmaceutical Society at that particular date was the enmity which the ambitions of the physicians had aroused among the druggists. If the hatchet was now buried it was no doubt because the physicians saw clear evidence that the united druggists were making earnest efforts to improve the country's pharmaceutical service and so produce a class of men on whom reliance could be placed for sound drugs and accurate compounding. Already the effect of this was seen in 1849, for in that year we find the Provincial Medical and Surgical Association, the forerunner of the British Medical Association, in collaboration with the council of the Pharmaceutical Society concerning the parliamentary measure which was to become the Arsenic Act. The first Pharmacy Act (1852) was, in fact, largely the outcome of their collaboration, for one of the proposals made by a joint committee of the two bodies was that the sale of arsenic by retail should be reserved to medical men and chemists and druggists. This proposal could not be adopted by the Legislature because there was at that time no legal definition of the term "chemist and druggist," a fact which was made so clear to members of Parliament during the passage of the Arsenic Act that steps were soon taken to prepare one. Since then the British Medical Association and the Pharmaceutical Society have been in contact at many points: in more recent times there were, for instance, discussions arising out of National Insurance legislation in 1911, the Dangerous Drugs Act in 1920, the Select Committee on Medicine Stamp Duty, 1914, the Poisons Board, 1934, the Medicines and Surgical Appliances Advertisement Bill, 1935–6, and in 1938 the discussions regarding the differentiation between valuable and other medicines advertised only to the medical profession.

The centenary of a society is no small matter. To weather the storms of a hundred years needs not only stamina but good intentions well carried out. The Pharmaceutical Society began with the intention of raising the standard of pharmacy by educating those who practised it; a hundred years on we find the descendants of William Allen and his colleagues still carrying on the good work and the School of Pharmacy an integral part of the University of London. By encouraging and subsidizing research in the fields of pharmacy and sciences allied to it the Pharmaceutical Society has made great gifts to medicine.

For the past sixteen years Dr. Mazyek P. Ravenel has edited the *American Journal of Public Health*, which during his direction has achieved an unrivalled position in public health literature. The January issue commemorates the appointment of Dr. Ravenel as editor emeritus, and contains appreciations of his work from different men distinguished in public health services and a bibliography of his writings from 1891 to the present date.

DOCTORS HARD HIT BY THE WAR

HELP FROM MEDICAL RELIEF FUND

He was decorated for gallantry in the last war; and when an incendiary bomb set fire to his house some months ago, destroying his furniture, clothes, books, instruments, spare cash, and other possessions, Dr. A could "take it," though the financial consequences were very serious. He is a general practitioner who has been carrying on under difficulties in a much-raided district from which many of his patients have departed. He bought the practice only a few years ago. His bank, which provided the necessary capital, holds his investments as security for the loan. He has found that rent, rates, taxes, bank interest, insurance premiums, and other expenses, professional and domestic, absorb almost the whole of his diminished wartime income. But Dr. A has been carrying on, paying his way.

When the bomb fell Dr. A was determined to continue carrying on. But how to continue paying his way? There were vague reports in the Press about a proposed Government Bill to provide compensation for air-raid damage. At some remote date Dr. A might perhaps be able to recover at least part of his loss. Meantime he had to pay for board and lodging for himself and his wife. And he urgently needed new clothes, new instruments, and a second-hand car.

Fortunately for Dr. A, the Medical War Relief Fund had recently been established. He seemed just the sort of man, involved in wartime misfortune through no fault of his own, that the Fund was designed to help. He was granted a substantial gift of money to provide for immediate needs, and in addition a loan which he is expected to repay, without interest, when he is in a position to do so. The Fund has received from him the following letter: "I am overwhelmed with gratitude and cannot express to your Committee the heartfelt thanks I wish to offer them. My case is probably typical of many others, but I have never been dealt with so kindly in all my life. I will now be able to buy some clothes, and I shall use the money to the very best advantage. I am enclosing a separate letter accepting your loan, free of interest, and I undertake to pay it back when I receive my next panel cheque. I may at some time probably be able to let you have the whole of this amount back, when more peaceful times arrive. For the moment I cannot say more than 'Thank you.' Your gift has cheered me up tremendously."

Dr. B is a comparatively young man who practises as a specialist. It was a high-explosive bomb that came his way, seriously damaging his house and wrecking his garage. His private practice has largely vanished. His children are at boarding schools and his educational expenses are heavy. He has a few National Savings Certificates, but most of his savings have been invested in life insurance policies. In acknowledging a loan from the Medical War Relief Fund Dr. B wrote: "I feel that my colleagues have come to my rescue in a noble manner, and the keen edge of anxiety is removed. I shall of course repay the loan when I am in a position to do so."

Dr. C is a man of advanced age with a small practice and correspondingly modest expenses. His income has been reduced owing to loss of patients through evacuation, while his expenses have temporarily increased as a result of his house having been seriously damaged by enemy action. This exceptional expenditure presented a difficult problem to a man of slender means who was just making ends meet. The Medical War Relief Fund has solved the problem with a gift which will tide Dr. C over the emergency.

Dr. D is a general practitioner in middle age. He has been handicapped by health troubles, but in the years immediately preceding the war his professional income increased steadily, and although his house was heavily mortgaged his financial affairs were not such as to cause alarm. He is a veteran of the last war, and in his circumstances many a man would have been content in September, 1939, to consolidate further his position in civilian practice, leaving the uniform of the R.A.M.C. to the younger generation. Not so Dr. D. He served in France, but after Dunkirk he was obliged to relinquish his commission on the ground of ill-health. Meantime the income from his practice had diminished, and there was an awkward interval between the date when his Army pay

ceased and the date when professional accounts would become payable. He was in need of a considerable sum of money for current expenses and for the payment of pressing debts. The Medical War Relief Fund gave him the necessary amount, partly as a loan and partly as a gift, as it was thought that an obligation to repay the full sum would prove an unduly burdensome addition to his other commitments. Dr. D has written: "I wish to express my sincerest appreciation and thanks for your very generous gift and loan to enable me to re-establish myself in my practice after my discharge from the Army. I shall be refunding the loan at the very earliest opportunity to enable you to help others who may find themselves in my late predicament."

Dr. E, an elderly general practitioner, has given his life on the Home Front. The bomb which killed him destroyed his home and all his possessions. His reduced practice, situated in a relatively vulnerable area, is unsaleable. The Medical War Relief Fund could not undertake to contribute towards the maintenance of his widow for the remainder of her life, but it gave her a substantial sum to meet immediate necessities, and also assisted her to obtain a very satisfactory pension from another organization. She has left the committee of the Fund in no doubt as to her gratitude.

Dr. F was killed by a bomb when on duty at a first-aid post. Other bombs damaged his residence and his surgery. The widow will receive a pension of £1 17s. 3d. a week from the Government, and there will be little addition to this even if it is possible to sell the practice when the surgery has been repaired. Mrs. F has no relatives who can assist her financially, and she cannot at present undertake remunerative work as there are children to be cared for. The Medical War Relief Fund has granted her a gift which will be paid in annual instalments over a period of five years. The money has been handed to the Royal Medical Benevolent Fund for administration, and this body will therefore be able to maintain contact with the family and advise Mrs. F if at a later date additional help is required for the completion of the children's education.

Aims and Constitution of the Fund

It might happen to any one of us, though we are not all exposed to equal risks. It would be good to know that there would be help for our wives and children if they should be numbered among the unfortunate; to know that our colleagues had created a fund to which they could appeal without humiliation, a fund which we ourselves had helped to establish, a fund that could come to the rescue in a manner worthy of a generous profession. It is to achieve this object that the Medical War Relief Fund has been instituted, and the above cases illustrate the work that is being done.

The purpose of the Fund is defined as the temporary assistance of registered medical practitioners and their dependants who find themselves in financial straits as a direct result of war conditions. Applicants must be "registered members of the medical profession, British subjects domiciled in England, Scotland, Wales, the Isle of Man, the Channel Islands, and Northern Ireland, and such of their dependants as the Committee may determine." Assistance takes the form of a gift or a loan free of interest, or may be given partly as a gift and partly as a loan. The Fund is administered by a Committee representative of the British Medical Association, the Royal Colleges, and the Royal Medical Benevolent Fund. The cost of administration is very small and it has not been necessary to acquire special office accommodation or to appoint a special staff. The Honorary Treasurer and Honorary Secretary of the Fund are officials of the British Medical Association and the cost of their work, which includes much correspondence connected with the collection of subscriptions, is defrayed by the Association. A Distribution Subcommittee has been appointed to consider applications and vote awards. The Royal Medical Benevolent Fund was invited to nominate a number of the members of the Subcommittee, and the Secretary of that body acts as Secretary of the Subcommittee.

More Support Needed

The subscription lists already published show that many individual practitioners, B.M.A. Branches and Divisions, Local Medical War Committees, Local Medical and Panel Committees, and other professional organizations have responded to the appeal in a magnificent way. At the end of March, 1941, the contributions exceeded £20,000, and more than £4,000 had already been expended since the date of the first awards—that is, during a period of four and a half months. Further subscriptions will certainly be needed, for the number of applicants is increasing and will doubtless continue to increase as the war goes on. Every member of the profession is asked to send a contribution, however modest. Collections are being made in many areas, but any practitioner who has not received a local appeal may send his subscription to the Honorary Treasurer of the Medical War Relief Fund at B.M.A. House, Tavistock Square, W.C.1. Cheques should be made payable to the Medical War Relief Fund. The latest list of contributions is published in the *Supplement* this week.

Doctors will not fail to discharge their responsibilities, whatever the risk, and it seems inevitable that many of them will suffer. Is it not both a duty and a privilege to ensure that in their hour of need they will be able to echo the words of one who has been helped by the Fund and say that they too are "proud of their profession"?

AFTER-CARE OF MENTAL PATIENTS

The annual meeting of the Mental After-Care Association was held on March 26, with Colonel Henry Yellowlees in the chair. H.R.H. Princess Arthur of Connaught was elected president in place of the late Lord Wakefield. Incidentally, it was announced that Lord Wakefield had left the association a bequest of £5,000, which had placed it in a more satisfactory position than it had ever enjoyed. Colonel Yellowlees presented the annual report, which was a record of many-sided services continuing in full vigour notwithstanding the distractions of the war. The total number of patients who had been dealt with during the year was 2,663. Over 600 first visits were paid to the homes of patients. The convalescent homes, all of which have been brought from the coast inland, had accommodated 303 after-care and 237 early-care patients (meaning, by the latter, patients ill but not ill enough to be certified). The number of patients boarded out was 372. One of the most recent additions to the association's activities has been in finding accommodation for suitable hospital patients, thus setting beds free for more urgent cases. At present the association is arranging to take another large number from various L.C.C. hospitals. Still more recent is some work done at the request of the Ministry of Health in air-raid shelters and rest centres.

An address was given by Miss E. D. Vickers, the late secretary, who has held the post with conspicuous success for the last twenty-five years. She described how in cottage homes patients were assisted over the difficult transition from hospital to everyday life. At the end of the last war there was an enormous influx of early-care patients, and the same thing would probably happen again. Another type of home was established for patients who could be discharged but would never be able to take care of themselves. These were also a great success and enabled old people to spend their last days as members of a family instead of in an institution. As for the holiday homes, she thought it a wonderful tribute to the patients and those in charge of them that in a year when 1,200 patients were sent for a fortnight's holiday only one complaint was received from a member of the public.

T. B. Patel and B. P. B. Naidu (*Ind. med. Gaz.*, 1940, **75**, 730) state that among cases of small-pox admitted to the City Hospital at Bombay nearly 50% were unvaccinated. A very large percentage of admissions were from the adult population, as the immunity conferred by vaccination does not wear off until the tenth year. The mortality among the vaccinated was low (3.3 to 3.7% up to 20 years of age), as compared with that among the unvaccinated, which was 17 to 60%. Administration of sulphanilamide reduced the mortality in confluent cases by about 30%, but had no influence on the course of the disease except in the septic type, and no effect on haemorrhagic cases.

Reports of Societies

FACTORS INFLUENCING THE HEALING OF WOUNDS

At a meeting of the Medical Society of London, on March 31, Dr. G. W. GOODHART presiding, a discussion took place on factors influencing the healing of wounds.

Dr. J. M. CONVERSE (U.S.A.) opened by referring to the stimulus which war gave to surgery, and recalled the work of Ambroise Paré, of Larrey in the Napoleonic wars, of Carrel, Almroth Wright, and others in the last world war, and of Trueta in the Spanish war. The subject of wound healing was too vast to cover in a single address, and he could only select certain factors. He drew attention particularly to nutritional ones—the value of the protein factor, especially in severe burns, and of vitamin C—also to the manner in which healing was interfered with by infection, which produced tissue destruction and devitalization and delayed the repair of wounds. Another factor of great clinical importance was contraction, and yet another the closed-plaster treatment of wounds. On this last subject he said that at the American Hospital in England certain impressions had been gained—based, however, on too small a number of cases, generally compound injuries. Closed plaster did seem to control local infection. It also seemed to promote repair of connective tissue in a remarkable manner. Furthermore, granulations observed in the wounds even after a month still presented the characteristics of young granulation tissue. But although closed plaster might favour connective tissue growth it did not seem to favour epithelial tissue regeneration. The epithelium that grew around these wounds under plaster grew extremely slowly and was of very poor quality. After the bone repair had been assured by immobilization in plaster it seemed a hardship to keep the patient in plaster for months because his superficial wound had not healed. It was possible that the inhibitory effect of the closed plaster was due to the presence of the plaster itself, and he believed that was Dr. Trueta's opinion. If the bone lesions admitted, the patient could be taken out of the plaster and the wound treated in the usual manner with the aid of chemotherapy. When the plaster was changed, if the appearance of the wound showed that it was ready to receive an epithelial covering skin-grafting might be done, again in combination with the use of sulphanilamide. This had been carried out in three cases in his experience and had proved successful. It was possible that observation of the bacterial condition in the course of the change of plaster would be helpful, and if the patient in whom the haemolytic streptococcus was present had sulphathiazole put into the wound it was very likely that at the next change of plaster no sign of the streptococcus would be found.

On the general question of chemotherapy as a means of countering the infection which hindered wound healing, Dr. Converse gave the example of a wound around which there was a marked inflammatory reaction with oedema. This oedema around the wound prevented the contraction which was due to the pull of the fibroblasts, and by interfering with contraction had a remarkable effect in preventing the wound from healing. In one such case sulphanilamide powder was used as a local treatment, and within two days the wound had shrunk to half its size and the test for streptococci was negative. Whether it was due simply to the subsidence of the oedema or to the contraction which was thus enabled to take place, the fact remained that this was an example of the influence of infection in preventing a wound from healing and of the value of chemotherapy.

Dr. Converse concluded by expressing the view that the present trend of treatment of wounds suggested that this war would see the more general application and use of skin grafts, not by specialist plastic surgeons, but by surgeons in general.

The Anti-scorbutic Factor

Mr. ALAN H. HUNT said that wounds failed to heal when there was an absolute deficiency of vitamin C, though it might be that a relatively low concentration of the vitamin was all that was necessary in man. He proceeded to describe an experiment on guinea-pigs—animals far more susceptible to scurvy than man—to illustrate the sub-scurvy stage, the effect of partial deficiency of the vitamin on the formation of collagen fibres. Some observations on human patients showed that the critical level of vitamin C in the formation of collagen in man was probably well below saturation point, but there was sufficient evidence to justify giving full doses of vitamin C to certain groups of patients, preferably before operation, or as soon as possible after. Cod-liver oil applied locally had a beneficial effect.

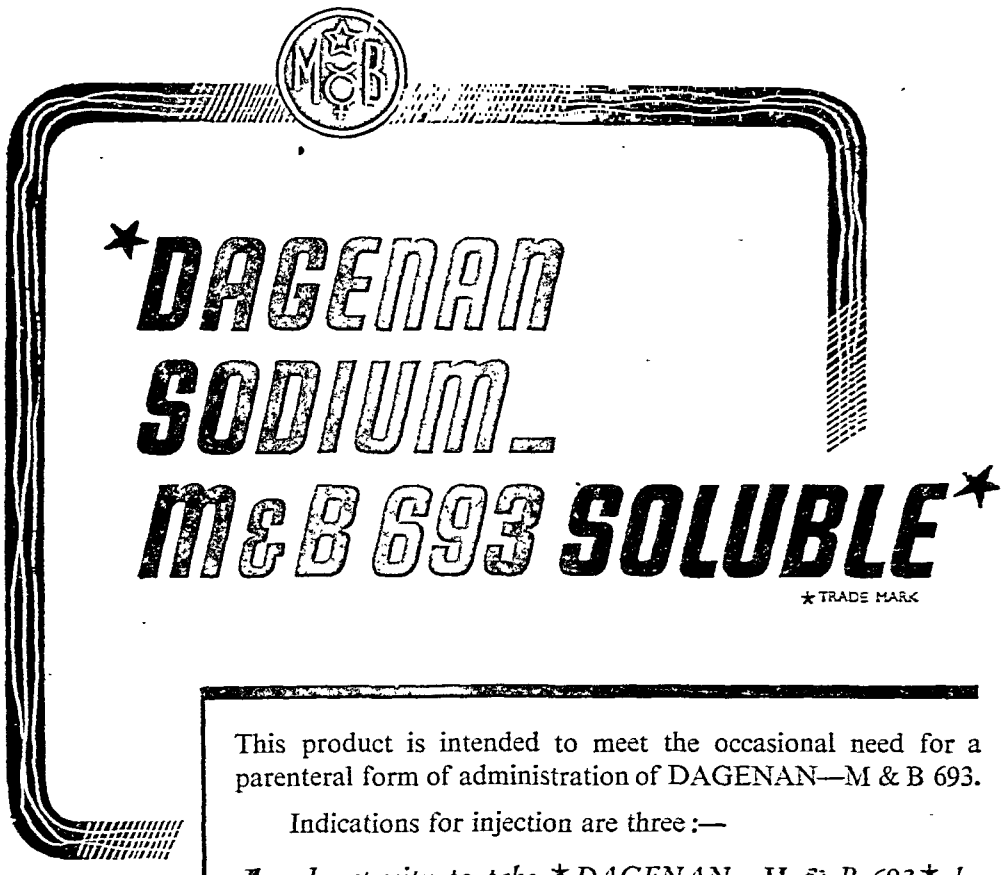
He also mentioned *x*-ray therapy in the treatment of wounds. Cellular proliferation and therefore the quantitative production of callus were inhibited in proportion to dosage, but the cells themselves were supposed to mature more rapidly and therefore to produce a more fully developed interstitial matrix. The effect of *x* rays, therefore, was beneficial so long as minute doses were used.

Mr. R. T. PAYNE spoke of the importance of the nutritional state of the patient, and in illustration gave an account of the post-mortem findings in fifty-one cases in which death had followed partial gastrectomy. Of this number, sixteen had had general peritonitis, and in twelve of these at the site of the operation on the stomach there was complete evidence of non-healing. Another third of the cases died of pulmonary infections, which might be held to represent another failure of repair—a failure to overcome potential infection. In these malignant gastrectomy cases the anaemia was often extremely grave, and was not always corrected before operation. Another point suggestive of the importance of the nutritional state was the loss of weight. It had been shown that in operations on the gastro-intestinal tract the prognosis was directly related to the antecedent loss of weight. In some figures quoted, among patients who had lost more than 20% of their original body weight the mortality was only 3.9%, while in patients who had lost more than 20% the mortality was in the region of 33%. By paying more attention to the nutritional state, not only mortality after operation but also morbidity would be reduced. So often the post-operative diet was considered only as a question of calories, which was but a part of the dietetic factor.

General Discussion

Mr. ZACHARY COPE, as one who had seen a good deal of scurvy abroad and something of it in this country, said that two or three days after taking a normal amount of the anti-scorbutic factor the patient was well, so that it seemed strange that a patient in the condition of sub-scurvy to which Mr. Hunt had drawn attention should require such relatively large doses of the substance as were indicated by his experiments. Was there some other factor? Mr. E. W. RICHES had been interested to hear Dr. Converse say that the general surgeon should be prepared to cover a wound with skin and not leave it to the specialist plastic surgeon. That was what the plastic surgeons in this country were now saying. Dr. G. W. GOODHART thought it highly probable that the ascorbic level varied enormously in different people, although healthy people required a very large amount by mouth before they would excrete it in the urine. Sir THOMAS DUNHILL said that there was a fairly good ascorbic margin, but if by tests carried out in this way surgeons could be made a little more sure of the condition of the case before they operated, lives would be saved. The progress of surgery lay along the path of ever-increasing pre-operative as well as post-operative care. Not the finest post-mortem work in the world would make up for poor surgery.

Dr. CONVERSE, replying on the question of scurvy, referred to an experiment by Crandon carried out on himself. Crandon went on a vitamin-C-free diet from October of one year to May of the next. He became free of vitamin C in the plasma at the end of forty-two days, but the ascorbic acid persisted in the leucocytes for 122 days. He developed clinical scurvy in five months. An experimental wound done on him at the end of three months healed perfectly normally; this was when he had zero ascorbic acid in his plasma, but before it had disappeared from the leucocytes. At the end of six months an experimental wound failed to heal and showed



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the characteristic lesions which the sections shown by Mr. Hunt had depicted.

Mr. HUNT, also in reply, said that it was the custom at his hospital to give vitamin C in all cases in which a major abdominal operation had been performed, particularly where a viscus had been opened; in all cases which were seriously wounded; in all cases where there was evidence of nutritional deficiency; and, recently, in all cases in which rapid healing of the wound was desirable—that is, where it was specially desired to have clean, almost invisible scars—and he was sure that the scars in the patients who were saturated were on the whole much better than those in the patients who were not. In seriously deficient cases they played for safety and gave 1,000 mg. of the ascorbic acid preparation per day for three days, afterwards maintaining the saturation by giving 100 mg. per day for about three weeks while the wound was healing. In ordinary cases these doses were too large, but in certain cases with achlorhydria present they were too small. When the substance could not be administered by the mouth it was given intravenously. Recently they had tried intramuscular administration, and it seemed satisfactory, allowing for the fact that intramuscular administrations were rather uncomfortable for the patient.

Sir JAMES WALTON proposed a vote of thanks to the openers, particularly to the visitor from the United States, and mentioned the debt which British surgeons owed to their American confreres. The vote of thanks was seconded by Mr. W. E. TANNER and heartily carried.

*** Some of the problems in the healing of wounds are discussed in a leading article at p. 560.

Correspondence

Medical Planning Commission

SIR,—In the generous space which you allow to correspondence on the Medical Planning Commission you have recognized the importance of the issues involved and the value of wide interest in the project. I feel, however, as Chairman of Council that the time has come for a reply to some of the criticisms which have been made and for an emphatic correction of erroneous views which apparently prevail as to the nature and objects of the Commission. At any other time the whole matter would have been discussed at a meeting of the Representative Body, but circumstances rendered this out of the question. At the same time the matter is urgent and can by no means be left until the end of the war, for if we medical men and women do not make up our own minds we may find ourselves faced by a solution of the medical problems of the country in which we have not been consulted and which we are forced to accept. One would have thought that even thirty years is scarcely a sufficient period to produce complete amnesia.

As has in fact been very fully stated, the object of the Commission is to discuss the possibilities which the future after the war holds for our profession and to present these possibilities in the form of a reasoned report. Obviously it has no executive power, nor can it bind either the British Medical Association or any of the bodies which are represented upon it. But it *can* examine the whole field, it can take evidence and gather full information, it can and I hope that it may reach definite conclusions, and it can then submit its findings to every branch of the profession for acceptance or rejection. For such a purpose I maintain that the Commission has been properly constituted in accordance with the very explicit requirements of our constitution, that it would be impossible to devise a body better suited to its purpose, and that it deserves the fullest support and confidence from the whole of our profession.

It would seem from the correspondence that very few medical men have the vaguest idea of the complexity of the problems by which the Commission will be faced, and the pathetic suggestion has actually been made that they should be referred to the profession in the form of a questionary. Those of us who have studied the subject realize that if at the end of a year's hard work a tentative conclusion has been reached on even a few of the problems the Commission will deserve congratulation. If it can then present a reasoned plan for the consideration of the profession as a whole, it will have earned our gratitude. I feel that I am paying it a very high tribute when I express my firm belief that it is equal to its task.

The appointment of the Commission was carried out with the full democratic machinery of the Association so far as it is available in wartime. The Council of the Association after a full discussion decided that in the interest both of the public and of the profession a Commission ought to be established to study the effects of the war on medical practice and to consider the direction in which medical practice should develop in the reconstruction of national life after the war. It decided further that, although the Association would give the Commission the fullest support and place all its resources at its disposal, it should be an entirely independent body representing the whole medical profession and so constituted as to speak for the whole profession with unquestioned authority. With this object negotiations were opened with the three Royal Colleges, and after some months of discussion they all agreed to co-operate in the most cordial manner. The three Scottish Corporations, the Society of Medical Officers of Health, the [illegible] the Medical Women's Federation, and [illegible] dical Committee were all invited to [illegible] all have accepted the invitation. It is difficult to see how a manageable body could have been formed on a wider basis or one which could represent the profession with greater authority.

Apart from the representatives of important medical bodies a number of individuals were invited to serve on the Commission on account of the interest which they had shown in the development of medical practice and the constructive work which they had already done, and after most careful selection they were approved by the Council as representing every branch of practice. Where any branch appears to have been overlooked, or where the services of any individual seem of special value, it will still be open to the Commission to add to its number if it so desires.

In the composition of the Commission the greatest care has been exercised to maintain a just balance of the many interests involved, and I venture to think that this has been obtained. If the representation of the great medical bodies has meant the inclusion of a large number of specialists, there are still more than twenty members chosen for their experience of general practice, and from what I know personally of their expert knowledge of their subject and their skill in debate and negotiation they are likely to exercise an influence upon the findings of the Commission out of all proportion to their number. Moreover, it is probable that most of the work will be carried out in committees devoted to special branches of practice, and in each of these the special branch involved will of course have a preponderant representation.

The age of the members of the Commission has aroused much criticism, with which I have the greatest sympathy but which it is very difficult to satisfy. In the first place, there are very few young men with either the experience or the interest required, and in the second all those who would in normal times be available are engaged with His Majesty's Forces. In spite of this it will be found that eleven members are under 45 and thirteen others are between 45 and 55, and surely all these would be accounted young in any branch of political life. But I feel certain that every member of the Commission will realize that he is planning not for himself or his contemporaries but for those who will follow him in the new world after the war, for the students whom he has taught, for his partner who is in the fighting line, perhaps for his own son.

Moreover, use will be made of the machinery of the Association to test the Commission's work as it proceeds, and the views of the Divisions and Branches will be invited before coming to any important conclusion, while the representatives of the different bodies involved will certainly wish to consult the bodies which they represent. In this way the Commission would carry with it the profession as a whole and would ensure that its ultimate findings met with general support.

Finally, it has been suggested that the work we are undertaking is properly the function of a Royal Commission, and that we are arrogating to ourselves a position to which we have no right. With such a view I most emphatically disagree. It is perfectly true that the reorganization of the medical services of the country may in the end have to be undertaken by a Royal Commission, and that many interests are involved besides those of the medical profession. But how can any Royal Commission commence its work without our advice, and how can it provide a medical service for the nation without the support of those who alone are in a position to understand its needs? Unless we have ourselves made up our minds as to what is required legislation will only result in chaos.

We have to face the fact that after the war changes in the medical services of the country, perhaps of a revolutionary character, are inevitable. It is of the utmost importance that the medical profession should make up its mind what these changes should be, not in its own interest alone but in the interest of the whole community, and this can only be done after a close study of the very intricate problems by a body specifically chosen for the purpose and commanding the confidence not only of medical men but of the whole nation. I venture to think that the Commission which has been formed satisfies this very exacting criterion, and that when its report is finally submitted to the consideration of a Royal Commission it will form the foundation of a new era in the medical services of the country.—I am, etc.,

London, W., April 4. H. S. SOUTTAR.

Crush Injuries

SIR,—I would like to add my meed of praise on the magnificent series of articles on this subject in your issue of March 22. They furnish a number of facts of the utmost importance. There are three points on which I should like to make some comment:

Traumatic Arterial Spasm.—Some anxiety about the blood supply of the limb was felt in the majority of cases, but in only two of the Bywaters-Beall series was the artery explored. I should like to draw attention to this phenomenon of arterial spasm, or arterial "stupor," as being a quite common clinical entity. With injury, a direct blow, or blood extravasation in the neighbourhood, the artery goes into spasm. John Hunter wrote of it, and Griffiths[1] in a recent Hunterian Lecture stressed its importance, especially in Volkmann's contracture. That it is not the tension of the oedema which obliterates the vessel is well illustrated by Bywaters and Beall's first case. Here, according to the report, though the leg was cold and was amputated for it, there was no arterial damage, no oedema deep to the fascia, and only blood extravasation around the popliteal artery. I would urge, from my own experience and a growing literature; that if the cause is local and the radial or tibial pulse has not returned at the end of six to twelve hours, full exploration is advisable. If delayed for more than twenty-four hours it seems that, as in embolism, thrombosis vitiates the result. Exposure of the vessel, clearing it and not necessarily doing a periarterial sympathectomy, relieves the spasm immediately or within a few hours. The incision left unsutured adds nothing to the risk of infection of the damaged area. Continued spasm is one factor in providing "the particular opportunity," as Mr. Ogilvie described it, for gas-gangrene infection.

Sulphapyridine Haematuria.—Bywaters and Beall discuss the possible role of sulphapyridine in this condition. As observed by Long,[2] 8% of cases undergoing sulphapyridine therapy develop haematuria, and its importance therefore cannot be ignored. It is the custom of many medical officers to include sulphapyridine in their intravenous "cocktail." I know of two such cases that developed oliguria and blood in the urine—one being fatal after a dose of only 4.5 grammes. Taking all the sulphonamides, renal complications are apparently four times more likely with sulphapyridine, and this forms a strong reason why, especially in burns, shock, and now crush injuries, its systemic effect should be avoided.

Untreated Shock.—As Mr. Franklin and Mr. Douglas' point out, renal failure is not encountered in the usual "unburied" crush injury. There is one difference: the trapped patient receives no treatment. The oppressive anxiety, the cold, the fixation of the chest and muscles, all tend to increase the shock. The M.R.C. point out that after shock has existed for some time an irreversible process sets in leading to permanent damage. They stipulate no time, for obviously there are many factors that influence it. But we know from the work of Bayliss[4] that in cats in which shock was induced and untreated there was after two hours no recovery with any form of treatment. Best *et al.*[5] in their work on the use of plasma for haemorrhage showed how essential rapid administration is for recovery. And the kidney, with its refined function, is particularly sensitive to changes in the blood supply. In experiments on animals even transitory interference with either their arterial or their venous supply produces albuminuria. Clamping of the renal artery for from ten to thirty seconds will cause the secretion to stop, followed by the appearance of albumin in the urine. As Bywaters and Beall point out, secretion also ceases if the blood pressure falls below 75 mm. Hg. And it must be remembered, in assessing the data, that the first specimen of urine passed may have been in the bladder before the "incident." The fall in blood pressure associated with shock affects the circulation of the brain and the heart muscle, as well as the kidney. Coronary thrombosis or heart-block may follow, often only twenty-four hours later, if there has been a prolonged fall of blood pressure just as in spinal anaesthesia. It may explain the cardiac changes and the sudden death in some of these cases.

I note these facts to urge that shock be not treated expectantly, as is being advocated in some of the recent articles on air-raid injuries. Nor must it be a leisurely affair, with slow drip over hours, if the irreversible factors are not to come into play. It seems pertinent to suggest, therefore, that besides the oxygen which Sir Leonard Hill[3] recommends, fluids to convey it are advisable.

Lastly, may I congratulate the authors on the clarity with which the problem was presented. It affords a striking illustration of co-operating with the physicians in the treatment of casualties, and the advisability of their more frequent attendance in the operating theatre and surgical wards.—I am, etc.,

March 31. SOL. M. COHEN, Surgeon, E.M.S.

SIR,—I have read with great interest the cases of crush injury with associated renal failure described in your issue of March 22, and I think that the various teams are to be complimented on the thorough nature of the investigations made and treatment given under what must have been trying conditions.

In view of this thoroughness it is with some diffidence that I suggest an intravenous solution which has, apparently, not yet been used. It is isotonic sodium sulphate solution given by the constant intravenous drip up to a maximum of three litres a day. The use of this solution is based on work published in the early years of this century by Crile on the permeability of the renal epithelium to various salts in isotonic solution; and first applied clinically in Edinburgh and published by Band in or around 1934 in the *Edinburgh Medical Journal*. I have had some personal experience of its use in the oliguria and anuria met with in obstructive lesions of the genito-urinary tract associated with poor renal function. In them the diuresis is considerable, even after an anuria lasting for many hours.

The two types of cases are not strictly comparable, but in the cases of obstruction the lesion is certainly an active congestion of the kidney, and it is therefore possible that the isotonic sodium sulphate solution might, in conjunction with plasma, restart normal renal secretion in these crush injuries. In conclusion, I must apologize for the vagueness of the references, but at the moment I have no ready access to the literature.—I am, etc.,

March 26. A. IAN L. MAITLAND, Surgeon-Lieut.-Commander, R.N.V.R.

[1] *Brit. J. Surg.*, 1940, 28, 110.
[2] *J. Amer. med. Ass.*, 1940, 115, 364.
[3] *British Medical Journal*, 1941, 1, 491.
[4] M.R.C. Reports, 1919: Wound Shock, p. 10
[5] *British Medical Journal*, 1940, 2, 248

Treatment of Burns

SIR,—One has read with interest the article by Dr. J. M. Robson and Mr. A. B. Wallace (March 29, p. 469) on a further treatment of special burns, incorporating as it does the use of sulphonamides and the principle of osmosis, and adopting once more repeated dressings. May I, at this juncture in the development of burn treatment technique, suggest for investigation the value of the closed method in selected cases? It may be used well in children for burns of the upper limbs, and it possesses some advantages—for example, avoidance of painful dressings, rapid separation of sloughs, and saving of time. A viscopaste bandage is applied over the area, and in the second-degree burn is usually left on until healing is complete, though it may be renewed once during that time. Its value in deeper burns lies in rapid separation of the slough. The ultimate result is good and it is striking how soon the child forgets its injury. This method precludes the use of sulphonamide locally, except initially. With regard to the paste used by Robson and Wallace, while the osmotic action is of value in small areas where oedema is present, it would presumably be a disadvantage over larger surfaces. Would it be possible to incorporate sulphonamide in a more or less isotonic base for general application?—I am, etc.,

Turriff, Aberdeenshire, March 31. G. D. ROCHE.

SIR,—"A small percentage of disasters is enough to condemn any method"; at least, so reads the last sentence of the leading article on the treatment of burns (March 29, p. 484). On the same hypothesis almost every known surgical procedure would be precluded, for not many medical students qualify without having seen treatment result in disasters a good deal worse than a stiff hand. Of course failures occur in the application of any form of treatment. It is for us to weigh success against failure in rival forms of therapy. Burnt hands have been given the tannic acid treatment for many years with much success and undoubtedly a small percentage of failures (and no "disasters" in many surgeons' experience), and treatment with saline packs, recommended recently, after no comparable period of trial, may produce even worse failures. I have seen one.—I am, etc.,

Redhill, Surrey, April 1. NORMAN PITT.

Chemotherapy in Otitis Media

SIR,—Most ear, nose, and throat surgeons admit that large doses of sulphanilamide and sulphapyridine can abort otitis media during the invasive stage, and in the right case can favourably influence the course of the disease during the suppurative process, when haemolytic streptococci or certain types of pneumococci are the cause. Dr. J. B. Jessiman confirms this view in his careful article (March 15, p. 399). I venture, however, to suspect, from his excellent description of "bullae and sacs," that five of his seven cases were actually of otitis externa haemorrhagica, which responds well to chemotherapy, unless it is complicated by otitis media—difficult to discern beyond the blebs. There is not often a great loss of hearing in these cases, which occur mostly in an influenza epidemic. However, this is not the point. The real issue is whether we are to treat cases of otitis media by paracentesis or chemotherapy, or whether we are to watch their agony until the drum bursts.

I would say that many cases (perhaps the majority) of otitis media get better whatever the treatment, and may not even get to the stage of discharging. Such excellent results are often attributed to the latest form of treatment. The remaining cases are serious and may lead to fatal complications, which we must leave no stone unturned to prevent. Many of these are referred to specialists, who, from a very large series of cases, are beginning to assess the true value of these powerful drugs. It is in the serious cases that we must compare the results of any treatment.

In my experience the result of an early (but above all not too early) paracentesis is in most instances little short of miraculous, and I am sure that the mental trauma, whatever that may be, of a half-minute operation done in bed, probably at night, must be negligible compared to a week's earache coupled possibly with the nausea, vomiting, and cyanosis of chemotherapy. I hope the day will soon come when this simple operation will become part of the armamentarium of every general practitioner. It can be done easily with an electric auriscope and a suitable knife (long enough to pass through the instrument) under a very short anaesthetic, although the specialist may appear to need more. I have never seen any harm come of paracentesis, and I cannot remember a permanent perforation resulting where the case had the proper after-treatment.

Chemotherapy is of value before pus is formed, but cannot in my opinion help much once there is pus and the ear discharging, unless there is an associated high temperature or septicaemia, when it is extremely useful and has prevented much premature mastoid surgery. We must, however, be careful not to make our patients worse. For instance, the temperature and pulse may come down, and the leucocytosis too; yet there is still mastoid tenderness. What is happening? What is one to do next? Like other ear, nose, and throat surgeons, I have had to do some nasty mastoids which might have been avoided if the drum had been opened and the chemotherapy discontinued.

As for the waiting and watching with fomentations and anodynes, which is not without its supporters, I am prepared to confess that if paracentesis is delayed for several days the cases often do better than some others. This may be due to the fact that they may not be bad enough to cause rupture of the drum. I must, however, regard it as nothing short of barbarous to force days of unnecessary pain (which is intense) on a child or anyone else when it can be relieved so easily and when every day increases the danger of intracranial complications, to say nothing of mastoiditis and deafness. I believe that it will be a long time before we know all about these new and wonderful drugs. Their indiscriminate use for mere earache will lead to their disuse. Let us instead, like Dr. Jessiman, control their effect by careful observation, remembering all the time that cases do very often get better without any treatment whatever.—I am, etc.,

York, March 18. R. THOMAS.

Convulsion Therapy by Electricity

SIR,—It was with some surprise that I read Dr. Gerald Caplan's paper (March 29, p. 479) on the use of faradic current as an approach to the therapy of mental disease, for although acquainted with the work of Berkwitz I did not expect to find history repeat itself to such an extent in this country. During the nineteenth century methods closely similar to those adopted by Berkwitz and Dr. Caplan were described by Arndt, Erb, Allbutt, and others, and Blandford in 1896 expressed the opinion that the apparent improvement noted in some psychotics was due to the moral rather than to the physical effects of the treatment. This observation was no doubt occasioned by the distress that accompanied the treatment. Allbutt's description of the method employed by him is of interest, as it was carried out in this country and described in the West Riding Lunatic Asylum Medical Report for 1872. The current was obtained from modifications of the Daniell cell and was applied to the head for ten minutes. The immediate effect of this was to "tranquillize," an effect which Allbutt did not think was due to the mere "astonishment" evoked by the procedure, for it did not lessen on repetition.

In America reluctance to adopt at once the unmodified method of convulsion therapy by electricity is not at all surprising when one reflects that there judicial execution is mainly carried out by high electric potentials, and indeed inept comparison has been made in this country with the methods of Sing Sing (*Lancet*, 1939, 2, 1373). By the method adopted by Berkwitz and now described by Dr. Caplan considerable fear and pain are aroused during the application of the current, although Berkwitz does not think there is any real "mental anguish." It is to allay this as much as anything else that the intravenous anaesthetic is given. It is the elimination of fear that is one of the chief claims of electric convulsion therapy to consideration.

With reference to the remission obtained by Dr. Caplan, while the occurrence of the convulsion with low currents is of interest it was possibly brought about by summation of subliminal stimuli, or by an increase in the effective current

as the head resistance dropped, which it no doubt did with passage of the current. The convulsion, too, may have had a direct bearing on the remission, for it was only after this occurrence that it was decided that the patient was well enough for treatment to be discontinued. Finally, the imputation of respiratory and brain complications to convulsion therapy in general is misleading, for I am unaware of any such having been ascribed to electric convulsion therapy, although one account records vertebral fractures in two cases. At this hospital 130 patients have undergone electric convulsion treatment, with a total of some 1,800 major fits, without the occurrence of any complications, and I trust that Dr. Caplan's unwarranted statements regarding the dangers of convulsion therapy will not prejudice others against the electric convulsion method.—I am, etc.,

JAMES S. MCGREGOR.

Warlingham Park Hospital, March 31.

Cerebral Venous Thrombosis after Childbirth

SIR,—We have read with interest the article by Drs. J. Purdon Martin and H. L. Sheehan (March 8, p. 349). As we have seen two cases of this condition in the last month, it seems advisable to record them in support of Martin and Sheehan's statement that this complication of childbearing is less uncommon than might be supposed. The clinical features conform in general with those described in the original article, but neither patient experienced fits or coma. Moreover, the diagnosis cannot be proved because both patients recovered. The rapid disappearance of the paralysis of the first patient was remarkable, but the improvement in the second patient is much slower.

Case 1.—A 4-para aged 37 was admitted to hospital on February 13, 1941, three days after delivery of a stillborn child. The stillbirth was due to a prolapsed cord. There was no abnormality until the morning of the third day, when loss of power in right arm and leg was noticed. This spread rapidly, and within a few hours a complete right hemiplegia was present with loss of speech. The elbow-, knee-, and ankle-jerks on the right side were exaggerated and the right plantar reflex gave an extensor response. The blood pressure was 130/90. There was no albumin in the urine. The temperature was 99° F. on the third morning and 99.8° on the fourth. Blood examination showed a moderate anaemia: R.B.C. 2,600,000; haemoglobin 50%; W.B.C. 9,750; blood N.P.N. 37 mg. per 100 c.cm. Wassermann, negative. No abnormality was found in any other system. The hemiplegia improved fairly rapidly, and when the hospital had to be evacuated a month later she had almost completely recovered, but walking showed up the weakness of her leg.

Case 2.—A primigravida aged 21 was admitted to hospital on February 26, 1941. She had been attending the hospital's ante-natal clinic. There was a history of rheumatism in childhood. She had mitral stenosis, but this lesion was well compensated. A trace of albumin had been found in the urine on February 13. The admission was arranged because of the premature onset of labour at thirty-two weeks. On February 27, as the labour was progressing very slowly, the membranes were artificially ruptured, and this was followed by a normal delivery. The first four days of the puerperium were uneventful. On March 3 at 8.30 p.m. she complained of breathlessness, cough, headache, and pain in the right side of the chest. Blood pressure 130/90. At 10 p.m. she became very restless, breathing was distressed, and she complained of a sharp pain in the right thigh. The pulse rate rose to 140. She was given omnopon gr. 1/3. An hour later she developed a complete left hemiplegia. Temperature 99.4° F., pulse rate 120. Her breathing was now less distressed. The left biceps and supinator reflexes were exaggerated, as was the left knee-jerk. Ankle clonus was present and the left plantar reflex gave an extensor response. Wassermann, negative. She was stuporose at first. (The chest symptoms in this case suggest the possibility of pulmonary thrombosis as an added complication, as in Case 2 of the original article.) The paralysis remained complete until March 7, when she was able to raise her left leg. The plantar reflex still gave an extensor response. By March 11 she could flex the left knee, raise the left leg fairly well, and raise the arm slightly from the shoulder. All these movements were "flail-like." The face remained paralysed. There has been very little further improvement up to date. On March 18 she complained of pains in the chest and difficulty in breathing; she was restless and cyanosed about the lips. These symptoms settled down after two injections of omnopon gr. 1/3. There are now signs of probable thrombosis in the left leg.

We wish to thank our house-surgeon, Miss Jolly, for the careful notes kept on the progress of the second case.—We are, etc.,

ARTHUR A. GEMMELL.
T. N. A. JEFFCOATE.

Liverpool, March 29.

Night-blindness and Vitamin A

SIR,—I was interested in the annotation (March 22, p. 446) on dark-adaptation tests for vitamin A deficiency. In view, however, of the present large number of drivers who might be called upon to drive at night under emergency conditions—that is, A.R.P. ambulance drivers and drivers of fire engines and of cars for rescue squads and sitting cases—the question of a more accessible test is important. These people normally sit "on call" in a brightly illuminated room awaiting urgent summons into the often inky darkness outside.

I became interested in the problem because last December I was rather suddenly afflicted with night-blindness myself. After consultation with the A.R.P. officer, Mr. H. V. Casey, we called together the A.R.P. car drivers and tested them in the following manner: We used two long rooms in the Report Centre building, separated by a door containing a "hatch," such as police station inquiry offices often have, with a 10-watt bulb in the distant room and the hatch shut. The people to be tested were collected at the farthest end of the near room. Standing there with all the other lights out, the cracks at the top and bottom of the hatch showed just enough light to form a suitable test. Each candidate was made to stand watching the hatch for some sixty seconds in the full light of a 100-watt bulb in the centre of the room. This light was then switched off and the interval of time measured with a stop-watch until the cracks of light around the hatch became visible.

Eleven people were tested at the first sitting and gave the following readings in seconds: 5, 7, 8, 10, 11, 11, 14, 15, 20, 37, 56. Probably only the last had any true degree of night-blindness, but to be on the safe side the worst three were provided with halibut-oil capsules free. Re-tests have been done fortnightly ever since, taking the greatest care to have every detail of lighting, etc., exactly reproduced. At the next sitting the one with the 56-seconds reading had reduced her speed to 25 seconds, and there was no other reading above 21 seconds. Since then all drivers have been 20 seconds or less, except for one of 48 seconds and one of 82 seconds (myself). In both cases the culprits had for one reason or other failed for the preceding few days to take their ration of vitamin A.

A simple test such as this, practised widely, would avoid the two opposite disadvantages of (1) allowing night-blind people to remain undetected, a menace to themselves and the public, and (2) wasting money by issuing halibut oil to all, and also wasting the work of men who fish for halibut in the dangerous seas.—I am, etc.,

L. M. JOYCE HENRY.

Bedworth, March 25.

Vitamin B_1 in Diphtheria

SIR,—I should like to endorse the remarks made by Dr. Duncan Leys in his letter (March 29, p. 495) regarding the usefulness of vitamin B_1 in diphtheria and other toxic states. I have seen similar cases with gallop rhythm, vomiting, albuminuria, and diminution of urinary output during the second week of the disease, which appeared to respond rapidly to the administration of vitamin B_1 by intramuscular or intravenous injection.

There would appear to be need for further investigation into this subject, but the use of vitamin B_1 in cases of severe diphtheria would seem justifiable, to ensure complete oxidation of the large quantities of glucose usually given to such cases; at least until some simple deficiency test, similar to that used for vitamin C, becomes available.—I am, etc.,

HUGH CLEGG.

Kirkcaldy, March 31.

Cost of Vitamins

SIR,—It appears to me unfortunate that at a time when vitamin-containing foods are scarce the cost of vitamin preparations, which is always high, should be enhanced by purchase tax. I understand that the price of liver preparations has not been raised, and surely vitamin preparations should come into the same category, if, indeed, they are not subsidized by the Government so as to enable all to get them.

It would be interesting to know whether the gastric derangements found in the Army could be attributed, to any extent, to diminished vitamin intake, particularly of C. As we are told that black-currants are particularly rich in C it is to be hoped that some scheme will be devised for their preservation this summer, without sugar but with minimal destruction of the vitamin. Probably this would be best accomplished by factories using vacuum evaporation, but as this would involve much labour and transport, perhaps you would publish at an early date the best scheme for preservation by the country people themselves. This would be valuable even apart from the question of vitamin C, which may be solved by our American cousins.—I am, etc.,

Glasgow, March 31. J. MACEWEN.

Invalid Diet and Egg Shortage

SIR,—We are in complete agreement with the views expressed by Dr. Richard Bell in his letter. A possible source of increased rations for poultry or pigs could be obtained from a reduction in the amount of grain allowed for brewing and distilling. In the twelve months preceding the war 750,000 tons of grain and 450,000 tons of sugar products were used for these purposes. A 20% reduction would therefore save 150,000 tons of grain, sufficient to form half the food supply of 7 million head of poultry. We understand that recently a 10% cut has been made in the grain allowed and a 30% in the sugar. Would a further 20% reduction in the former be a hardship?

We are firmly of the opinion that the British working man, though he does not relish a reduction in his beer, would consent to the same if it were fairly put to him that the result would be an increase in the number of eggs avilable for the nourishment of his sick children.—We are, etc.,

N. I. SPRIGGS.
Leicester, March 31. S. E. TANNER.

SIR,—May I for one write in support of Dr. Richard Bell (March 22, p. 460) on the above most important question? The Ministry of Food publicly announced that eggs were not a vital food: that cheese (now unobtainable), dried peas, beans, and lentils were preferable. Those who understand dietetics know that the Leguminosae, valuable as they may be in their proper place, are the most indigestible of all articles of food and in no way a substitute for eggs in the diet of invalids, convalescents, and young children; the same applies to carrots and potatoes. Doubtless chicken feed is scarce, but surely the feeding stuffs given to that pampered animal the racehorse would do more to win the war if given to laying hens.

We should all heartily endorse Mr. Bell's last remark, which, we hope, will be noticed by the Council of our Association as worthy of suitable action.—I am, etc.,

S. H. FAIRRIE, M.B.,
Cheltenham, March 30. Lieut.-Colonel, R.A.M.C., retired.

Cyclical Mucosal Ulceration

SIR,—Dr. Prosser Thomas (March 15, p. 418) makes some interesting comments on my article (February 22, p. 271), and expresses the opinion that cyclical mucosal ulceration is due to a herpetic virus. In my article I mentioned that Kumer (1930 and 1932) had put forward the same idea but that the evidence is not very strong. Herpes is a condition capable of laboratory verification, and until this is done on a patient suffering from cyclical mucosal ulceration Dr. Prosser Thomas's view must remain merely a suggestion. Unfortunately I had not at my disposal the laboratory facilities necessary to prove or disprove such a conjecture.

What appears to me to be an important point against this herpetic theory is that the condition which I described is confined to mucous membranes, whereas the herpes virus, even if it involves mucous membranes, also affects skin at its junctions with mucous membranes if not elsewhere. I have seen a case, not published in my series, of a girl who suffered from dyspeptic symptoms associated with each cycle of buccal and vaginal ulceration. Gastroscopy on several occasions demonstrated similar ulcers of the gastric mucous membrane, which, after a few days, healed without scarring. Does the herpes virus ever involve the gastric mucosa? It is this restriction of the condition which I described to mucous membranes which appears to me to be an important argument against a herpetic aetiology. In the condition of catamenial herpes it is the skin of the lips and vulva and not the mucous membrane which is primarily and mainly affected. Catamenial herpes is a condition frequently mentioned by dermatologists, but gynaecologists make little or no mention of it. How common is the condition? I would like to have the opinion of gynaecologists in particular, as several have admitted to me that they have never seen a case of this malady.

Most students experience difficulty in mastering the fundamentals of medicine, mainly, in my opinion, because many "teachers" and medical writers use terms which they do not bother to define. This slipshod use of a vague quasi-scientific terminology infests much of our medical literature. The replacement of easily understandable English terms by Latin phrases is another slovenly habit to which many of our profession are addicted. Such translations never place a diagnosis on a more scientific footing.

Dr. J. Bernstien (March 8, p. 381) and Dr. B. Baneth (March 29, p. 494) suggest that cyclical mucosal ulceration is allergic. But allergic to what? Why do some medical men take such delight in suggesting that every condition of obscure aetiology is allergic? Dr. Baneth adds that "if the disorder is clearly associated with menstruation it might be classified amongst the menstrual molimina." I am not sure exactly what this means or how it helps. "Molimina," I suppose, is derived from the Latin noun "molimen," meaning "effort." Dr. Baneth states that because there was a familial incidence in some of my cases this suggests allergy. But how illogical to believe that because an unusual or exaggerated susceptibility to substances usually innocuous is often inherited any condition that exhibits a familial incidence suggests allergy as an underlying cause!

"Jevons, thou shouldst be living at this hour:
Medicine hath need of thee."

—I am, etc.,

Mitcham, Surrey, March 30. MALRICE H. PAPPWORTH.

Obscure Nervous Effects of Air Raids

SIR,—From time to time in your columns (and those of other journals) there have been references to shock, neurosis, etc., as a result of air raids. The general effect of these references has been to indicate a surprisingly low degree of nervous and shock response among the civilian population when subjected to heavy bombardment.

I am not a medical man, though trained as a biologist. I therefore write with diffidence on a subject about which I know little. But I have, on the other hand, had exceptional facilities for the observation of ordinary people during the past seven months of heavy raids. It has been my job to visit and report the after-effect of all the heavy raids and to follow up (with the assistance of a staff of investigators) the human results of the raids, both within the town attacked and in the surrounding areas affected by evacuation. It is the latter activity, the follow-up on evacuees—particularly "voluntary" evacuees—which has brought us up against the point I should like to put forward in this letter.

In widely separated areas, from Plymouth to Liverpool, from Coventry to Clydeside, we have come across several cases of persons who, after a heavy bombardment, have left next morning, found a billet with friends or relatives or strangers, and then caved in. In some cases they have simply taken to bed and stayed in bed for weeks at a time. They have not shown marked trembling or hysteria, but an extreme desire to retreat into sleep and into being looked after, as if chronically ill. We have found such cases mainly among women but also among men and children. We have not been

particularly looking out for the cases. Gradually, over a period of months, we have become impressed with the possibility that there may be quite a large number of them. They would not ordinarily be reported to a doctor at all, and tend to be regarded by the hosts as in the category of: "She's had a terrible time; what else can you expect?" Some general practitioners would probably treat the situation in much the same way. Certainly, such cases (partly because they do not conform with the ordinary pattern of neurosis and partly because they occur largely in small villages, etc.) are not likely to be reported to or to reach any psychiatrist. Yet they may be serious and even enduring reactions.

I am only raising this matter because it deserves further inquiry. I think it is conceivably misleading, even dangerous, when medical people look around the *cities* and in shelters, rest centres, and casualty wards, do not find the expected symptoms, and therefore go on to say that there is little nervous effect. The material conditions for potential neurosis in "blitzed" towns differ in many respects from any previous conditions. New types of reaction may be expected, and I believe are occurring; in particular, states of intense depression and retreat, without manifest physical symptoms. Such behaviour can have a profound effect on the morale of many others, as well as on the citizen capacity of the person directly concerned. I diffidently suggest that the matter might bear further thought and study.—I am, etc.,

London, W.11, April 1. TOM HARRISSON.

Plight of Consultants in Bombed Areas

SIR,—The position of members of the honorary staffs of hospitals in those provincial areas subjected to heavy bombing needs attention. Although some of the school children have been evacuated the bulk of the population remains; and the demand for ordinary hospital treatment is not less than before the war but more—in my case my wards are now spread over three hospitals (twenty-five miles apart) instead of one, and in addition E.M.S. routine treatment as well as the emergencies due to bombing have to be met. On the other hand, the wealthier members of the community have left, or at least have sent away their families; while heavy taxation has made a great inroad into the ability of middle-class patients to pay fees; and in either case all consultations and operations not absolutely *urgent* are "postponed." With the result that "income" has ceased to have any meaning for many consultants (I have made just £500 in a year, exactly the cost, with rigid economy, of running my practice).

What are we to do? Apart altogether from the feeling of loyalty to an institution that we have served for years, most of us are middle-aged, and can hardly be expected to resign appointments for which we have sacrificed patient years. We cannot obtain commissions, as the E.M.S. depends on us for its working. Yet the rewards from the latter are meagre—my cheque for sixteen months is under £40; and a major operation, including investigation, a fortnight's after-treatment, careful records, and a report with prognosis, brings in the fee of 11s. 6d. less income tax. Yet the medical services of the country depend on us, and we are apparently expected to provide them without any return at all: even if school fees, rent, and life insurance must be met from savings, the practice of eating cannot be entirely abandoned. In the London area those in a similar position get a retaining fee of £500 a year. The case for equal treatment of the Provinces seems unanswerable.—I am, etc.,

March 31. F.R.C.S.

E. A. Hines and N. W. Barker (*Amer. J. med. Sci.*, 1940, **200**, 117) made a clinical study of 280 consecutive cases of arteriosclerosis obliterans and a gross and histological examination of thirty-two legs amputated for this condition. The disease occurred mainly in men between the ages of 50 and 70. There was no significant difference in racial incidence. The pathological changes in the arteries consisted in (1) atheromatous plaques in the subintimal tissue, (2) degenerative changes in the medial coat, and (3) thrombosis. No variation of importance was noted in the lesions of arteriosclerosis obliterans among diabetic and non-diabetic subjects.

Obituary

We regret to announce the death on February 26 at Salisbury of Dr. WILLIAM ROBERT ORR of East Finchley. He studied medicine at Queen's College, Belfast, before the foundation of the University, and also in Dublin, graduating M.D. of the Royal University of Ireland in 1885, and M.Ch. and M.A.O. in 1886. Dr. Orr was in general practice for many years and became surgeon to the Finchley Memorial Hospital and medical officer to the local dispensary and maternity society. He joined the British Medical Association in 1899 and was chairman of the Finchley Division in 1927-8; he represented his Division at the Annual Representative Meetings in Bradford (1924), Eastbourne (1931), and London (1932).

Dr. WILLIAM FREDERIC CORY, a veteran Leeds practitioner, has died at his home in Headingley, aged 88. He was a student of the London Hospital and took the L.S.A. in 1874 and the M.R.C.S. in 1875. Among the appointments he held in former years at Leeds were those of honorary medical officer to the Jews' Mission and to the Gordon Boys' Corps, the Y.M.C.A. and the Y.W.C.A. Dr. Cory wrote several semi-popular booklets on sick diet and kindred subjects, and believed he could foretell the weather with a pocket spectroscope.

We regret to announce the death on April 3 in London, in his eightieth year, of Dr. M. HAJEK; late professor of laryngology in the University of Vienna. Prof. Hajek was a very famous teacher.

The Services

AWARDS AND MENTIONS IN DISPATCHES

The following awards have been made in recognition of distinguished services in the Middle East during the period August, 1939, to November, 1940:

O.B.E. (Military Division)

Lieut.-Colonels (Temporary Colonels) F. G. A. Smyth and Q. B. V. Wallace, M.C.; Lieut.-Colonel J. Melvin, M.C.; Majors (Temporary Lieut.-Colonels) A. O. Bekenn and J. M. Macfie, M.C., R.A.M.C.; and Major D. N. Chakravarti, I.M.S.

M.B.E. (Military Division)

Lieut. (Acting Captain) G. Lorriman and Lieut. H. R. Hartnell, R.A.M.C.

Mentions in Dispatches

Colonel (Acting Major-General) P. S. Tomlinson, D.S.O., and Colonel J. C. Sproule, O.B.E., late R.A.M.C.; Colonel (Acting Brigadier) A. J. Orenstein, C.M.G., S.A. Forces; Lieut.-Colonel (Acting Colonel) H. Alcock, Lieut.-Colonel D. C. Scott, O.B.E., Major (Acting Lieut.-Colonel) W. A. D. Drummond, Major (Temporary Lieut.-Colonel) F. R. H. Mollan, M.C., Captain (Local Lieut.-Colonel) R. P. Cormack (attached E.A.A.M.C.), Lieut. (Temporary Major) D. M. Blair, Captains J. MacMillan and J. B. M. Milne, and Lieuts. G. Geddes and J. B. Heycock, R.A.M.C.; Captain W. B. Stiver, I.M.S.; Jemadars B. D. Joshi and M. L. Varma, I.M.D.; Lieuts. (Local Lieut.-Colonels) S. W. F. Lee and C. H. Marshall, Lieut. (Local Major) D. Bell, and Lieut. A. C. E. Cole, E.A.A.M.C.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

In an Admiralty casualty list, published on April 4, Temporary Surgeon Lieut. LYON RAMSAY BLAIR, R.N.V.R., is posted as "Missing, Presumed Killed." He was the eldest son of the Rev. Dr. and Mrs. George Blair of Dundee, and was educated at the Morgan Academy, Dundee, and the University of St. Andrews. He graduated M.B., Ch.B. in 1931 and proceeded M.D. in 1940. He had held the post of casualty officer at Dundee Royal Infirmary, and was in partnership with Dr. George Bridge at Preston until November, 1939, when he joined the Royal Naval Volunteer Reserve. He had been a member of the British Medical Association since 1931.

ROYAL ARMY MEDICAL CORPS

Prisoner of War

Lieut. Joseph Gordon Kee.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Part I of the Final M.B. Examination (surgery, midwifery, and gynaecology) will begin on Tuesday, June 17, and Part II (principles and practice of physic, pathology, and pharmacology) on Wednesday, June 18. Names of candidates should be sent to the Registrary by April 29.

UNIVERSITY OF LONDON

ROYAL CANCER HOSPITAL (FREE)

The following candidates have been approved at the examination indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN MEDICAL RADIOLOGY.—*Part I:* I. H. Evans, C. K. Warrick.

UNIVERSITY OF EDINBURGH

The following candidates have been approved at the examinations indicated:

FINAL M.B., CH.B.—K. W. Beetham, J. F. Cameron, Frances C. E. Hutchison, A. F. Lang, Bertha Macfie (*née* Milne), W. A. T. M'Kendrick, A. K. M. Macrae, Joan M. M'William, T. M'I. Munro, E. J. Noble, M. R. Prestwich, Mary Scott-Wilson, J. G. Shearer, R. Taylor, C. C. MacD. Watson.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—E. Akwei, D. W. Horn, C. Odamtten-Easmon.

DIPLOMA IN PUBLIC HEALTH.—M. Nazir. *Part I:* Olive B. Barnetson, J. Cameron, W. Giles, Rachael Hunter, Margaret S. B. Langton, T. M. Small, Mona M. M'E. Thomson.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—F. B. Beaver, G. R. S. Jackson, D. W. Mayman, R. South, A. M. Williams.

MEDICINE.—C. N. D. E. Eastes, R. South, C. H. Wood.

FORENSIC MEDICINE.—C. N. D. E. Eastes, R. South, C. H. Wood.

MIDWIFERY.—G. J. Ambrose, J. A. Dodds, J. S. McGillivray, R. South.

The diploma of the Society has been granted to F. B. Beaver, J. S. McGillivray, R. South, A. M. Williams, and C. H. Wood.

Medical Notes in Parliament

Fourth War Budget

Sir Kingsley Wood, Chancellor of the Exchequer, introduced the Budget on April 7. The standard rate of income tax is to be raised by 1s. 6d. to 10s. in the £, the tax on the first £165 of taxable income being raised from 5s. to 6s. 6d. Existing allowances are to be reduced as follows: earned income allowance from one-sixth to one-tenth with a maximum allowance of £150, and personal allowance for married persons from £170 to £140 and for single persons from £100 to £80. The extra tax paid because of these two reductions will be credited to the individual after the war in the Post Office Savings Bank, with a maximum credit of £65 for 1941–2. The exemption limit for both earned and investment income is reduced from £120 to £110. There are no changes in indirect taxation, but the Medicine Stamp Duty is to be repealed from September 2 next, and legislation introduced with the object of maintaining a fair balance between the interests of pharmacists and those of other vendors. The Chancellor stated that the prices of further essential goods and services are to be stabilized to prevent increases in the cost of living. The excess profits tax is to remain at 100%, but 20% will be refunded after the war for essential reconstruction and readjustment.

Science and War

In the House of Lords on April 2 Viscount SAMUEL asked whether the Government could make any statement on the extent to which the assistance of scientists had been enlisted in the prosecution of the war. He said that the council of the Institute of Chemistry had expressed the view that some of the Government Departments took too narrow a view of the term "scientist" and concentrated too much on professors from the universities and the like.

Lord HANKEY said that the three main pillars of scientific research were the Department of Scientific and Industrial Research, the Medical Research Council, and the Agricultural Research Council. They were all responsible to the Lord President of the Council. There were joint committees on matters of common concern, and contacts could hardly be closer. On the defence side there were research organizations in the Admiralty, the Ministry of Supply (which undertook most of the research work for the War Office), the Air Ministry (which had now handed over most of its research work to the Ministry of Aircraft Production), and the Ministry of Home Security (which occupied a position intermediate between the Service Departments and the Civil Departments). In addition there was a good deal of research in the Civil Departments. The Scientific Advisory Committee was in close touch through the Royal Society with the great streams of scientific research and development, through the representatives of Government research with Government activities, and through its chairman and the Lord President of the Council with the policy of the Government in these matters. He did not agree that the Government interpreted the term "scientific" rather narrowly. The reason for the non-inclusion of applied scientists on the committee was not a failure to appreciate their great importance in the war effort, but simply that the proposal did not fit into the Government conception of the Scientific Advisory Committee. The Government was at present in touch with the professional societies concerned with a view to the possible establishment of a separate organization working in the field of applied science and in close touch with the Scientific Advisory Committee. The committee had devoted itself mainly to the contribution of science to the war, and would continue to do so, but it was also in touch with the Minister Without Portfolio, who was in charge of reconstruction. The Directors of Scientific Research of each of the Departments engaged mainly in war work were invited in turn to tell the committee something of their activities. The Medical Research Council was concerned in all problems that affected man's health and efficiency. This Council, with its forty-five committees or subcommittees, its National Institute for Medical Research, and its nine smaller research units, brought an immense assistance to the war effort. Before the war, in concert with the Ministry of Health, preparations were made for safeguarding public health against the risks of war conditions. An Emergency Public Health Laboratory Service was established with laboratories all over the country so that unusual outbreaks of disease could be rapidly identified. Stocks of antisera and vaccines were distributed throughout the country and provision made for their replenishment. The Medical Research Council assisted the Defence Departments by increasing the efficiency and well-being of men who had to operate aircraft, tanks, and so forth. Good work had been done by a Flying Personnel Advisory Committee, which, at the request of the Admiralty, had been extended to the Navy. A Military Personnel Research Committee had been set up. The success of the Medical Research Council was largely due to its being given full scientific freedom and complete control over the funds at its disposal. The Scientific Advisory Committee of the Cabinet attached great importance to the use of the facilities of the Medical Research Council. This would probably be extended.

Medical Care of Auxiliary Territorial Service

On April 1 Captain MARGESSON informed Miss Ward that the facilities for treatment of sick members of the A.T.S. were comparable in all respects to those provided for soldiers. An eminent woman doctor had been appointed to the A.T.S. Council to advise on all medical questions affecting the Service.

Captain Margesson also circulated a detailed statement as follows: A.T.S. personnel who wish to report sick attend at the medical inspection room provided for the unit or detachment or nominated for use by the A.T.S. in any particular area, and can there receive out-patient treatment from the medical officer. To meet the needs of those who require more than out-patient treatment, reception stations are provided for detachments of 300 and upwards, and sick bays are opened at medical inspection rooms for smaller units. At reception

stations the medical officer, who may be a woman medical practitioner, has a staff including V.A.D. nursing members and members of the A.T.S., and may have a sister or staff nurse if required. A.T.S. orderlies are authorized in sick bays where the strength of the detachment is over forty. As regards hospital accommodation, a wing for A.T.S. patients has been established in one large military hospital, and there are A.T.S. wards in over twenty of the larger military hospitals. In addition, military families hospitals are used for the A.T.S., and all the hospitals of the Emergency Medical Service of the Ministry of Health are available for them. So far as convalescent treatment is concerned, there is an A.T.S. convalescent depot, and a Red Cross convalescent home is reserved for the use of women serving with the Forces. Courses of lectures in hygiene have been arranged as part of the training of officers and other ranks of the A.T.S.

New Rates of Pay for Nurses

In reply to a question by Miss Irene Ward on April 3 Mr. ERNEST BROWN said that the shortage of nurses in hospitals providing for the general needs of the civil population, and in particular for infectious diseases and the old and infirm, was giving rise to anxiety. Available beds could not be used because of the shortage, and staffs were carrying on under increasing difficulties. He was appealing to women and girls to enrol for nursing service in any part of the country. Those who joined as nursing auxiliaries would not be sent to hospitals dealing with infectious diseases or mental cases or to sanatoria unless they volunteered for this service. Women who were prepared to take up nursing as a life career and to enter as student nurses one of the hospitals recognized as training schools would receive salaries at the rate of £40 a year, rising by annual increments of £5.

The salaries of members of the Civil Nursing Reserve in residential posts in hospitals were to be increased. Those of the assistant nurse and trained nurse included a sum representing the employer's contribution towards superannuation, and as from the first pay week in February the rates would be: nursing auxiliaries £55 a year, assistant nurses £70 a year, trained nurses £105 a year, with board, lodging, and laundry, and indoor and outdoor uniforms. Those who responded to the appeal and were accepted would receive a guarantee of a year's employment and would be asked to undertake to serve for that period. Recruits who joined as nursing auxiliaries would receive a short course of instruction in hospitals, during which they would receive 10s. a week as pocket-money, together with board, lodging, and laundry.

The Government had accepted the recommendation of the Athlone Committee that a Salaries Committee analogous to the Burnham Committees in the teaching profession should be established. The work of fifty-three State-registered nurses on the staff of the Ministry at Headquarters and in Regional offices, who were partly recruited for the E.M.S. services and partly for the public health and hospital work of the Department, would be grouped on its professional side into a Nursing Division of the Ministry under the general direction of a Chief Nursing Officer (Miss Katherine Watt) with two deputies.

Mr. Brown added that he had asked Miss Horsbrugh to make the Nursing Division her special concern. Mr. Johnston was making similar arrangements subject to such minor modifications as the conditions in Scotland required.

Increase in Scabies

Mr. ERNEST BROWN said on April 3 that there had been an increase in the incidence of scabies. Advice about the prevention and treatment of this disease had been given to local authorities, and their attention drawn to the importance of actively pursuing preventive measures under wartime conditions. Similar advice had been given in the leaflets and advertisements put out by the Ministry and the Central Council for Health Education. Further consideration was being devoted to the subject.

Notes in Brief

The number of medical officers employed by the Ministry of Health, including hospital staff under the Emergency Medical Service and officers on loan to other Departments or serving with the Forces, is 147, of whom fifty-two are serving in a temporary capacity. Sixty-three are employed in London.

EIREANN MEDICAL MISSION

A medical mission appointed by the Eireann Minister of Defence, which has come to London to study civil defence arrangements, was welcomed at the Ministry of Health on April 1 by Mr. Ernest Brown, Minister of Health, who was accompanied by Sir Weldon Dalrymple-Champneys, deputy chief medical officer at the Ministry. The mission, which is headed by Commandant Patrick J. Delaney, comprises nine surgeons and physicians. The members were presented to Mr. Brown by Mr. John Dulanty, High Commissioner for Eire. The mission will investigate medical problems arising out of evacuation and visit some of the reception areas. It will study the steps which are being taken by the United Kingdom Government to guard against the spread of infectious disease, and also examine the arrangements for maternity homes, first-aid posts, ambulance services, base hospitals, medical supplies, and blood transfusion. The Ministry of Health is providing full facilities for the mission's tour of inspection.

Medical News

There is an urgent demand for specialists in ophthalmology for the R.A.M.C. and the R.A.F.V.R. Any ophthalmologist who is prepared to offer his services and who feels that he can be spared from his locality is requested to communicate with the Secretary of the Central Medical War Committee, B.M.A. House, Tavistock Square, London, W.C.1.

The British Social Hygiene Council requires a part-time Medical Secretary to visit the Provinces and give lectures. Familiarity with social hygiene questions and interest in the sex education of adolescents are desirable. Particulars may be had from the Secretary-General of the Council, Tavistock House South, W.C.1.

At the next meeting of the Shaftesbury Military Hospital Medical Society, on Tuesday, April 15, at 3 p.m., the address will be given by the president, Major-General F. Casement.

The next meeting of the North-Western Tuberculosis Society will be held at the Tuberculosis Offices, 352, Oxford Road, Manchester, on Thursday, May 8, at 3 p.m., when Dr. S. Vere Pearson will speak on "What are we aiming at in Collapse Therapy?"

Dr. Cyril James, Principal of McGill University, Canada, suggested recently that the Colonial Office might regard it as a contribution to the war effort if McGill were to establish a School of Tropical Medicine to carry on the work of the London School, which was believed to have been temporarily interrupted. Telegraphing his "grateful acknowledgment of this very kind offer," however, the Secretary of State for the Colonies, Lord Moyne, was able to assure Dr. James that he had been informed that teaching is being carried on effectively at the London School in spite of present circumstances, and that it is not anticipated, unless conditions become much worse, that assistance on the lines indicated would be needed.

Steel helmets are now to be issued on loan free of charge to domestic staff of a hospital working full time but living out, doctors and nurses regularly employed in public air-raid shelters, members of the Civil Nursing Reserve employed as assistants to district nurses, nurses employed in auxiliary hospitals, and members of V.A.D. and ambulance organizations who have to work in the open or have to travel during air raids. The number issued will be limited to that required to carry out the particular service efficiently. Helmets may also be purchased with the aid of the appropriate grant for volunteers regularly employed in ancillary services.

Dr. W. F. Rhodes, professor of medical jurisprudence at the University of Capetown and senior pathologist of the Union Health Department, has been appointed as the representative of the university in the Leprosy Advisory Council.

Dr. E. D. Friedman has been appointed Director of the Department of Neurology at the New York University School of Medicine.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The common infectious diseases are fluctuating in incidence without showing any definite downward or upward trend. Measles showed a drop of 368 on the previous week's figure, but increases have been returned from several areas, and figures for Dorset, Essex, Middlesex, and Warwickshire have increased for two consecutive weeks. The increase for Dorset, 31, has been fairly general throughout the county; the rise in Essex, 307, came from the urban areas; the rural districts were responsible for the increase in Warwickshire, 127. Edmonton U.D., where the number of notifications rose from 55 to 150, was responsible for the increase shown by Middlesex, 99. The decrease in notifications of measles in Scotland, 41, was general: the only area reporting an increase was Dundee, where 8 more cases were notified than in the preceding week.

Whooping-cough

The figure for whooping-cough in England and Wales shows a fall of 279, but increases for two consecutive weeks have been reported from several areas: for the counties of Durham, Essex, Leicestershire, Middlesex, and Oxfordshire notifications almost doubled during the two weeks March 1–15. The incidence was fairly widespread throughout the country, but in some counties the disease has been concentrated in the county boroughs. The chief instances are: Lancashire 828, Liverpool C.B. 156; Leicestershire 120, Leicester C.B. 81; Northumberland 99, Newcastle C.B. 45; Oxfordshire 66, Oxford C.B. 54; Warwickshire 197, Birmingham C.B. 126; Yorks (East Riding) 38, Kingston-upon-Hull C.B. 27; Yorks (North Riding) 48, Middlesbrough C.B. 30. A further rise in the number of cases of whooping-cough has occurred in Scotland, where an increase has been reported every week since February 8. Three-quarters of the notifications are from Glasgow—653 out of the 868.

Diphtheria and scarlet fever have slightly increased in England and Wales but decreased in Scotland and Ireland. Leicester C.B. has returned an increase of 19 cases of both these diseases.

Dysentery

The number of cases notified showed a further, but small, decrease. The outbreak in Biggleswade R.D. with 21 cases, for the week ending March 15 continues to be the most notable of the localized epidemics. The returns for Colchester M.B. for the last two weeks, 10 and 8 cases, suggest that the rather serious outbreak in this area is over; 177 cases have been reported from this town in the last seven weeks. Lancaster M.B., with 11 cases compared to 6 in the preceding week, is now one of the principal centres of the local outbreaks. Fresh centres of infection appeared during the week and multiple cases have been recorded from Cambridgeshire, Chesterton R.D. 6; Dorset, Dorchester R.D. 4; Kent, Dartford R.D. 7; East Sussex, East Grinstead U.D. 4. The London figures show an increase of 9 on the previous week's total; more than one case was recorded in: Chelsea 6, Hackney 2, St. Marylebone 5, Shoreditch 3, Wandsworth 2.

Cerebrospinal Fever

A decrease occurred in the incidence of cerebrospinal fever in England and Wales during the week. In Essex 14 cases and Warwickshire 23—in both instances an increase of 9 on the notifications for the preceding week—were returned. In the latter county the increase was mainly confined to Birmingham C.B., where the numbers rose from 10 to 16. Yorks (West Riding), 29 cases, returned 7 more cases than in the previous week.

Quarterly Returns of the Registrar-General

The returns for the thirteen weeks ended September 28, 1940, now published, show a death rate of 10.9 per 1,000, compared with an average of 9.8 in the third quarter of the five preceding years. The birth rate was 14.3 per 1,000; the average for the third quarters of the five preceding years was 15.3. Infant mortality was 42 per 1,000 live births, three below the average of the ten preceding third quarters. Stillbirths represented 3.5% of the total births registered.

No. 11

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 15, 1941.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	1941 (b)	1941 (c)	1941 (d)	1941 (e)	1940 (Corresponding Week) (a)	1940 (Corresponding Week) (b)	1940 (Corresponding Week) (c)	1940 (Corresponding Week) (d)	1940 (Corresponding Week) (e)
Cerebrospinal fever	330	19	58	1	14	543	51	110	3	5
Deaths		5	4				15	9		
Diphtheria	1,033	49	265	22	31	747	45	222	56	38
Deaths	31	—	11	1	—	22	1	7	5	2
Dysentery	146	21	25		1	29	3	87		—
Deaths			—	—	—			1	—	—
Encephalitis lethargica, acute	7	—	2	1	—	4	1	—	1	—
Deaths		2	—				1	—		
Enteric (typhoid and paratyphoid) fever	28	—	6	4	1	17	3	142	6	—
Deaths	—	—	2	—	—	—	—	2	—	—
Erysipelas			46	10	1			52	5	9
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years	36	4	10	4	6	33	2	11	6	10
Deaths										
Measles	15,056	315	130		23	4,332	74	82		233
Deaths	25	1	2	1	—	4	—	1	1	11
Ophthalmia neonatorum	—	—	13		—	95	6	26		—
Deaths										
Pneumonia, influenzal*	1,318	56	43	15	9	1,553	90	46	11	16
Deaths (from influenza)	132	15	11	2	7	315	28	28	16	15
Pneumonia, primary			506	9				348	23	
Deaths				23	23		93		21	27
Polio-encephalitis, acute	2	—				2	—			
Deaths		—					—			
Poliomyelitis, acute	5	—	1	—	—	12	1	1	1	
Deaths			—				—	—		—
Puerperal fever	—	—	2	5	—	2	2	11	1	—
Deaths		—					—			
Puerperal pyrexia	141	7	13		1	189	8	16		1
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,221	60	163	27	24	964	58	115	42	42
Deaths	—	—	—	—	—	1	1	—	—	—
Small-pox	—	—	—		—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	3,338	55	568		23	565	20	15		14
Deaths	33	2	21	1	—	5	—	2	3	—
Deaths (0–1 year)	465	37	150	26	35	520	61	97	41	43
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	6,134	922	841	269	261	7,220	1,118	935	267	210
Annual death rate (per 1,000 persons living)			18.3	17.9	22.9			17.0	17.8	19.4
Live births	5,203	404	859	357	255	6,574	1,043	913	390	220
Annual rate per 1,000 persons living			17.4	23.7	22.3			18.5	26.0	19.3
Stillbirths	250	16	28			273	32	32		
Rate per 1,000 total births (including stillborn)	—	*	32					34		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

Authors desiring REPRINTS of their articles must communicate with the *Secretary, B.M.A. House, Tavistock Square, W.C.1, on* receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

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TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London*; SECRETARY, *Medisecra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Treatment of Snoring

MR. HAROLD CHAPMAN, L.D.S. (London, W.1), writes: In reply to Dr. George Macdonald (February 1, p. 182), the following letter is taken from the *British Dental Journal* of November 15, 1940: "If the nares are free, a mouth valve, with the addition, if necessary, of a support for the chin, should make snoring impossible.—Yours faithfully, J. H. BADCOCK." In reply to another letter asking what a mouth valve is I wrote privately the following to my correspondent: "A mouth valve—screen is a better term, because its object is only to close an opening, the mouth—is a piece of material which lies between the lips and cheeks on one side and the gums and teeth on the other, to prevent air entering the mouth; it also prevents air leaving. It is made on a model made from an impression of the area taken in one piece and the teeth closed: it extends to the bottom of the sulci and back as far as the second premolars or first molars: it may be attached to the clothing by a piece of silk which passes through two pinholes in the screen." The material used is usually aluminium or celluloid: the screen is worn during sleep. Dentists make these for their patients to prevent mouth-breathing as well as snoring: they are also used in the correction of irregularities of the teeth.

Sjögren's Syndrome

A READER writes: Dr. Colls can find a full account of Sjögren's syndrome in Sjögren's article on the subject in *Modern Trends in Ophthalmology*, edited by Ridley and Sorsby, London, 1940, p. 403. Medication by thyroid extracts and vitamin A might be useful.

Income Tax

Premiums for Superannuation Benefit

"J. J." has two policies, under each of which he pays a premium of £75 to secure a deferred annuity. There is no capital sum payable at maturity or death. Is he entitled to an allowance for the full amount paid—i.e., £150?

*** No. Section 32 of the Income Tax Act, 1918, provides that an allowance for premiums paid for benefits other than payment of a capital sum shall not exceed "the amount of the tax calculated at the appropriate rate on £100." "J. J.'s" allowance must therefore be calculated as if his total payment were £100 only, and not £150.

LETTERS, NOTES, ETC.

Tuberculosis in the Navy: Corrigendum

Surgeon Rear-Admiral SHELDON F. DUDLEY, F.R.S., writes: In the report of my paper on tuberculosis in the Royal Navy appearing in your issue for April 5 there is a serious error in the abstract of the statistics near the bottom of page 531. The last two columns are incorrect. The table should have read:

	Re-examined (Full-size Radiograph)	Percentage Re-examined	? Active Tb. No.	? Active Tb. per 1,000
Trained men ..	269	4.0	31	4.5
New entrants ..	403	3.4	38	3.2

The matter is important, as the last column is a rate per 1,000, not a percentage; it also is of "suspected to be active" and *not* "established" progressive cases. As the figures were printed they made the amount of concealed pulmonary tuberculosis to be fifteen times as great as what was actually found in these groups of naval ratings.

In Gratitude to Medical Colleagues

MR. G. H. STEELE, M.S., F.R.C.S. (Guildford) writes: The Honorary Treasurer of the R.M.B.F. (March 29, p. 500) quotes the letter of a doctor who sent a donation to the Fund as an expression of his gratitude for treatment by colleagues. In doing this he makes a very helpful suggestion to all medical men who, as happens to most of us, are faced with the embarrassment of refusing to take a fee from a doctor patient or his dependants, who are uncomfortable if they feel they are trespassing on one's time. The situation is frequently overcome by a personal gift, but when the patient is embarrassed by accepting services without being able to pay, to suggest a thankoffering to the R.M.B.F. is surely the solution. I can recall several cases where such a suggestion would have made the patient easier in mind, and intend to follow this course in any such cases in future.

Adrenaline in Shock and Fever

DR. J. BARCROFT ANDERSON writes: There is one point in the paper of Drs. Bywaters and Beall (March 22, p. 427) on what they describe as crush injuries to which reference has not yet been made in your pages. They wrote: "The effect of adrenal cortical extract in this condition should also be observed." May I suggest that adrenaline chloride solution 1 in 1,000 every four hours by the mouth, in water, be tried. When treating bubonic plague in 1905 (*Lancet*, 1910, 1, 994) I found that its effect, so given, on constricting the pulse was almost immediate and lasted exactly four hours. My greatest dose in that disease was half a drachm. Sir Edward Thornton's obviously greater success in treating plague in 1907 was, I think, due to his giving larger doses of medicine. My treatment of the sick ended in 1925, and then ended my opportunity to study further the uses of adrenaline. In a case of haemorrhagic small-pox in a man aged 72, who for a week showed no sign of improvement, four-drop doses of adrenaline every four hours were followed by rapid recovery. In a case of enteric fever, beginning with delirium and with continued refusal to speak or swallow, four drops of adrenaline with some mineral acid were added every four hours to what went down an oesophageal tube. After some days this was discontinued, with an immediate rise in temperature of 1° F. When the adrenaline was resumed the temperature fell that degree. I have studied the adrenals in over 500 inquests. Where death was immediately preceded by shock or by acute fever from pathogenic germs the medulla was dark brown and so soft that the adrenal could be as easily inverted as the finger-tip of a thin kid glove. If there had been continuing illness due to a germ the adrenal was pale throughout and its cortex greatly thickened.

Scientific Films

Seven films were shown recently at the Polytechnic Cinema by the London Scientific Film Society, all of them relating to individual or communal health. "Men of Medicine" in the "March of Time" series, although not a new film, gives an interesting picture of the life of a doctor from student days to busy general practice, and includes a glimpse of the American Medical Association in session. "Health in War," produced by the G.P.O. Film Unit, records such changes in our wartime health services as the evacuation of children, the Emergency Medical Service in operation, and a special hospital working in a country environment. The scientific critic can find no fault and the lay spectator no dull minute in the life-story of the malarial parasite as shown in "Malaria" with some excellent photomicrography and also diagrams of the processes in the blood stream. The Ministry of Information has two new films: "We Have to Get Rid of the Rats," in which a rat-catcher supplies the commentary, and "The Red Army," showing how bed-bugs live and how they can be exterminated. "Land without Bread" is a French film, set in an isolated community on the borders of Spain and Portugal, and depicts the consequences of a diet for generations of potatoes and beans with wild cherries in the summer. Finally, in "Heredity in Man," in which the commentator is Prof. Julian Huxley, a difficult subject, and one which does not lend itself to the generalizations on which propagandist film technique depends, has been handled with care and discrimination.

National Union of Students Congress

The Hon. Secretary of the Middlesex Hospital Common Room Society writes to say that at a meeting of this society the students decided that a delegate should not be sent to the forthcoming National Union of Students Congress at Cambridge, and that formal notice of resignation be given to the Union. The main reason for this was that in the opinion of the society the activities of the medical subcommittee of the Union no longer retained a non-political character.

Messrs. John Bartholomew and Son, Ltd. (66, Chandos Place, London, W.C.2), have added a map of North-East Africa to their General World Series; the price, printed on paper, is 2s. 6d. net.

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BRITISH MEDICAL JOURNAL
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MEDICAL MAN-POWER

ALLOCATION BETWEEN CIVILIAN AND MILITARY SERVICES

The memorandum on allocation of medical man-power between civilian and military services, reproduced in an abridged form below, was issued by the Ministry of Health on March 28 to the medical officer of health of each county and local authority, to voluntary hospitals in the Emergency Hospital Scheme, and to other bodies concerned. The Circular is numbered 2323.

The steady expansion of the Armed Forces at home and over-seas has led to a growing need for doctors in the medical branches of the Royal Navy, the Army, and the Royal Air Force, which has recently been examined by the Ministers concerned in relation to the medical needs of the civilian community. This examination has made it apparent that further special measures are necessary on all hands if the limited numbers of doctors available are to be employed to the best advantage on work which as a whole much exceeds that falling on members of the profession in time of peace.

Service Needs

Accordingly, the three Service Departments are reviewing all their medical establishments, and it is hoped thereby to reduce in a number of ways the further calls that would otherwise have to be made on the doctors remaining in civilian practice in this country. The needs of the different theatres of war, however, are so great that such calls will still have to be made from time to time, which will be met as hitherto from practitioners liable to military service, through the machinery of the Central Medical War Committee appointed to advise the Government on these matters.

Review of Emergency Medical Service

The Minister for his part is reviewing the Emergency Medical Service with the intention of releasing for the Armed Forces a number of whole-time and part-time members now enrolled in it, (i) by reducing the present strength of the E.M.S. and (ii) by replacing, in addition, a number of British members by the enrolment of foreign practitioners admitted to practice under the Medical Register (Temporary Registration) Orders.

Review of Other Hospital Staffs

In the view of the Government, hospital authorities should take all possible steps in the same directions in relation to their own medical staffs. The Central Medical War Committee is inviting them to review the existing establishments of A, B2, and B1 resident posts with a view to considering the possibility of reducing them, and the Minister emphasizes that this recommendation has his support and urges hospital authorities to extend their review to any senior posts outside these three categories. In addition to savings in staff secured in this way, hospital authorities have been asked to consider favourably the employment of foreign practitioners recently facilitated by the Medical Register (Temporary Registration) Orders so as to release the British practitioners they replace for service with the Armed Forces. In the case of doctors of enemy nationality certain restrictions apply.

Replacement of House Officers by Senior Students

The Minister is also of opinion that the time has now come, as in the last war, to employ senior medical students in their final year of study on the duties of junior house officers (A posts) so far as is compatible with the law. By this means a number of present holders of A posts will be freed to perform duties now carried out by senior house officers (B2 posts) or junior medical officers (B1) who can be released for the Medical Branches of the Armed Forces. In the interests of medical education and to maintain a proper standard of efficiency of treatment students should be employed in this way only in hospitals where adequate supervision of their work by members of the teaching staffs of the medical schools would still be available. It is considered inadvisable to replace more than 50% of the junior house officers by students in this way. It is suggested that normally the students selected for these appointments should hold them for three months only, but the exact arrangements will depend on the ratio between the number of senior students in the medical school and the number of house appointments filled from that school, and upon other local conditions.

Practically all hospitals which will be able to employ senior students in this way are included in the Emergency Hospital Scheme, and financial arrangements for honoraria and for board and lodging have been made in respect of those so employed in voluntary and in municipal hospitals.

Mobility of Hospital Staffs

As the shortage of doctors makes it impossible for every hospital to be staffed up to the optimum standard at all times it becomes more important than ever to apply the principle of mobility of medical staff which has been inherent in the Emergency Hospital Scheme from the outset. In considering action under the circular, hospital authorities should feel that every hospital in the scheme is a unit in a comprehensive organization, and that they should therefore help each other and be able to rely on each other, in times of special stress, by lending or borrowing medical staff. Practitioners enrolled in Class I or Class II of the E.M.S. are at the disposal of the Ministry's Hospital and Group Officers for this purpose and have been transferred from time to time to hospitals faced with a special emergency, but the same principle should be freely extended by hospital authorities to medical staff in their own employment, on the analogy of the arrangements for mutual aid and reinforcement which form an important part of other Civil Defence Services.

In particular, the services of additional junior house officers (holders of A and B2 posts) are often invaluable for relieving temporary pressure upon hospitals, and the Minister hopes that every hospital authority will readily comply with requests it may receive from time to time from Hospital or Group Officers to lend its staff temporarily. He has refrained from enrolling holders of A and B2 posts in the E.M.S. in order that hospitals may enjoy full liberty of action to move junior house officers from one kind of work to another in the interests of their further education, and in order to facilitate a proper flow of newly qualified men into hospital establishments.

Public Health Medical Staffs

In view of the varying conditions of different parts of the country, and the change arising from evacuation and other large-scale transfers of population, no general direction can usefully be given in regard to the possibility of releasing members of public health medical staffs not holding hospital appointments. The Minister hopes that each authority will consider the question in the light of the circumstances of its area, and the Principal Regional Medical Officer has been instructed to confer in the matter with the M.O.H. It is not intended to suggest the release of officers where their removal would prejudice the maintenance of some essential health service, but each of these services should be reviewed with a view to effecting the maximum economy in man-power. For example, the employment of an available woman practitioner on maternity and child welfare work, and the transfer of other functions to a general practitioner over military age who

is able to spare an adequate proportion of his time from his private practice, might enable the authority to release a young member of its medical staff for service with the Forces. In some areas it may be possible to share the work of medical officers of health and their assistants between officers of different local authorities to a greater extent so as to spread the work over a smaller number of officers. Administrative and clerical duties not requiring to be directly performed by a medical man should be delegated to lay staff.

The various measures outlined in this circular should provide a substantial number of practitioners suitable for service in a medical capacity with the Armed Forces. Private practice has already been seriously affected by the recruitment of practitioners of military age, and, if a fair balance is to be preserved and essential medical services carried on, other branches of medical practice ought to make further contributions to the Armed Forces. The Minister relies upon public health and hospital authorities to co-operate in meeting this urgent national need.

E.M.S.: Payment for Referred Service Cases

The Ministry of Health has found it necessary to define still further the circumstances in which a medical practitioner is paid £1 1s. for conducting a special investigation or giving a second opinion on Service casualties or sick referred to hospital out-patient departments. Circular 2326, which has been sent to local authorities and to E.M.S. hospitals, points out that it was intended that cases should be sent direct to out-patient departments by military medical officers with a written diagnosis on which a second consultant opinion would be required, and that after the examination the patient would be returned to his unit along with, or followed quickly by, the report. It was not intended that payment should be made for cases referred to out-patient departments from other hospitals or for cases sent by military units for out-patient treatment only. Nor was it contemplated that in every case where patients attended for investigation for which *x*-ray treatment was necessary the examinations would invariably be regarded as special investigations, although it was recognized that there were circumstances in which cases might qualify for payment—for example, when a clinical examination was necessary. Hospitals are, therefore, asked to exercise special care before making the payments to satisfy themselves that these conditions have been properly observed, and to avoid submitting incorrect claims should ensure that all the cases are fully in accord with the intention of Circular 2176 to remunerate medical staff for consultative "second opinion." To enable the Department to be satisfied that the claims may be properly admitted the following particulars of each case should be submitted with Form A.G. 136: (1) The date of the examination. (2) The name, number, rank, and unit of the patient. (3) The name of the Army medical officer from whom, and the place from which, the patient was directly and specially referred. (4) The name of the hospital consultant carrying out the examination to whom the guinea was paid. (5) A brief note of the diagnosis.

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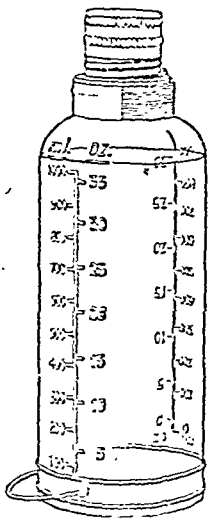
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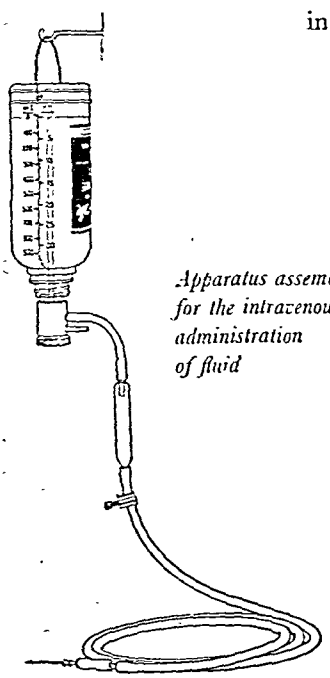
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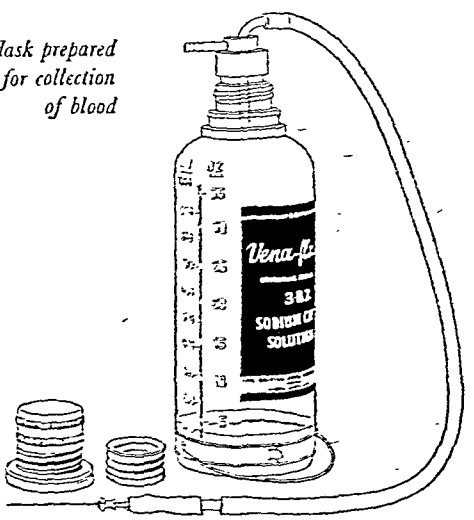
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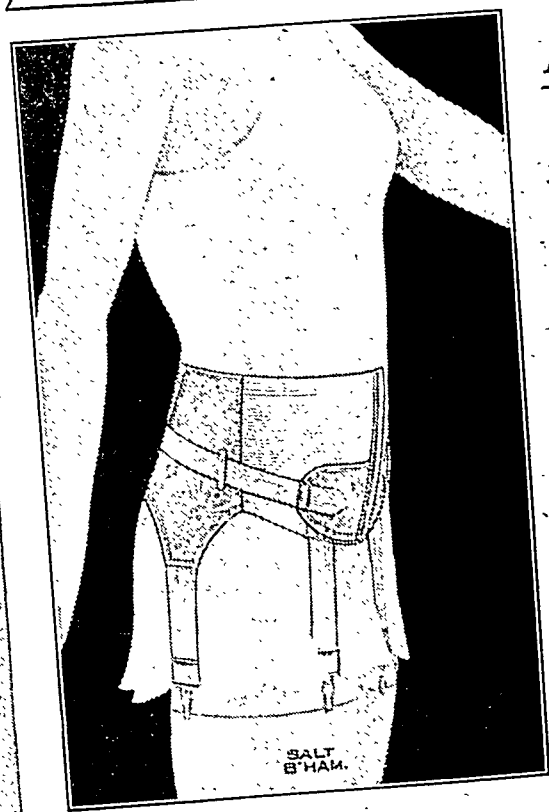
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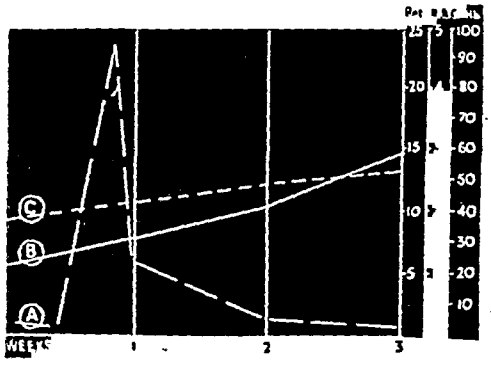
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PROTHROMBIN DEFICIENCY IN DISEASE OF THE LIVER AND BILE PASSAGES AND ITS TREATMENT WITH SYNTHETIC VITAMIN K

BY

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Prothrombin deficiency as a cause of haemorrhage in disease of the liver and bile passages has attracted attention in recent years and has resulted in an important therapeutic advance. A brief account of the development of this work may be given before reporting the results of the present investigation. Dam (1934) and Dam and Schönheyder (1934), while working on a problem of fat metabolism, noticed that chicks fed on a fat-free diet soon developed subcutaneous and intramuscular haemorrhages, which they showed were associated with a deficiency of prothrombin in the circulating blood. They observed that cure was obtained by adding green vegetables to the diet, but that it did not follow addition of the known accessory food factors. Thus a new dietary substance was demonstrated which had the power of increasing the amount of prothrombin in the blood when it was deficient. This new factor was found to be fat-soluble, and was named vitamin K by Dam after the initial letter in the Danish word "Koagulation." Quick and his colleagues (1935), working in America, observed prothrombin deficiency in the blood of patients suffering from severe obstructive jaundice. A link between these two observations was soon demonstrated by Butt *et al.* (1938), Brinkhous *et al.* (1938), and Dam and Glavind (1938) when it was shown that prothrombin deficiency and haemorrhage in obstructive jaundice could be prevented by administering ether extracts of alfalfa grass. This work was at once recognized to be of practical value in the surgery of obstructive jaundice, and was confirmed in America by Stewart and Rourke (1939) and in this country by Illingworth (1939a).

Studies on the constitution and properties of vitamin K were undertaken in Denmark and America. It was early recognized that a naphthoquinone group formed part of the molecule (MacCorquodale *et al.*, 1939); hence various naphthoquinone preparations were used in the treatment of prothrombin deficiency in obstructive jaundice. Of these preparations a water-soluble compound, phthiocol (2-methyl-3-hydroxy-1:4-naphthoquinone), given intravenously, was found to have some activity (Butt *et al.*, 1939), but was apparently not so potent as water-insoluble 2-methyl-1:4-naphthoquinone, injected intramuscularly or given by mouth in conjunction with bile salts (Almquist and Klose, 1939; Macfie, Bacharach, and Chance, 1939). After the active principle of the vitamin had been isolated and its constitution found to be 2-methyl-3-phytyl-1:4-naphthoquinone (Binkley *et al.*, 1939; Fieser, 1939), it was shown that 2-methyl-1:4-naphthoquinone was at least as potent as the vitamin itself (Ansbacher *et al.*, 1939).

Quantitative Estimation of Prothrombin in Blood

Prothrombin is considered to be a pro-enzyme associated with the globulin fraction of the plasma proteins. It is destroyed by heating blood to 60° C., and may be removed from plasma by adsorbing agents (Quick, 1940). It is believed to be formed by the liver, since the amount in the blood diminishes when the liver is severely damaged, as in acute cytolytic necrosis and in chloroform poisoning (Smith *et al.*, 1937), or when it is partially excised in dogs (Warner, 1938). The only known function of prothrombin is the formation of thrombin in the presence of calcium and thrombokinase, the latter being derived from platelets and tissue juice. Thrombin coagulates fibrinogen, forming fibrin. The velocity of this reaction bears a definite relation to the concentration of thrombin present: thus with small amounts of thrombin the coagulation time is prolonged; with large amounts it is shortened. Hence the time taken for the coagulation of a sample of blood in which adequate amounts of calcium, thrombokinase, and fibrinogen are known to be present will be an index of the amount of thrombin and so of the amount of prothrombin originally present. This coagulation time has been termed the "prothrombin time" (Quick, 1935), and is used as a criterion for the quantitative determination of prothrombin in blood. During the coagulation of blood two reactions are considered to occur, and may be represented thus: (1) prothrombin + calcium + thrombokinase → thrombin; (2) thrombin + fibrinogen → fibrin.

The prothrombin time includes both reactions, and objection may be raised that variations in the speed of the first reaction might vitiate the test as an index of the amount of prothrombin present, but in practice this has not caused any difficulty in my work. It is unnecessary to estimate the amount of fibrinogen in each sample of blood, since quantities insufficient for coagulation are seldom encountered.

Method of Determining the Prothrombin Time (Quick *et al.*, 1935, modified).—4.5 c.cm. of venous blood is taken

into a syringe containing 0.5 c.cm. of M/10 sodium oxalate. After centrifuging, 0.1 c.cm. of plasma is added to a 3 in. by 1/2 in. test-tube containing 0.1 c.cm. of lung extract* (used as the source of thrombokinase) and 0.1 c.cm. of M/10 calcium chloride solution (to neutralize the oxalate and leave a slight excess for the mechanism of coagulation). A stop-watch is started immediately on the

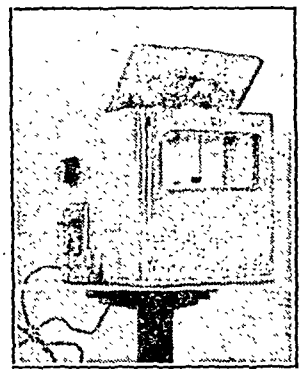


FIG. 1.—The coagulometer.

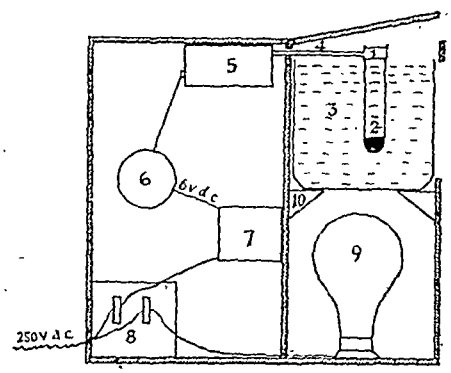


FIG. 2.—Diagram illustrating mechanism of coagulometer. 1: Spring clip. 2: 3 in. by 1/2 in. test-tube. 3: Water-bath. 4: Driving spindle. 5: Motor of "windscreen wiper." 6: Variable resistance for speed control. 7: Transformer and rectifier. 8: Switches. 9: Electric bulb as heat and light source. 10: Bracket to support water-bath. Thermostatic control was found to be *unnecessary*.

addition of plasma, and the tube, after being shaken gently for a few seconds, is transferred to a water-bath at 38° C. It is propelled in the water through an angle of 170 degrees by the apparatus shown in the photograph. This procedure ensures that the temperature and range of movement given to each sample are uniform, besides producing a sharp end-point. The watch is stopped when coagulation occurs. By this method the prothrombin time in healthy persons was found to average 25 seconds and to vary between 24 and 27 seconds. In jaundiced patients it varied between 25 and 140 seconds. Duplicate estimations were carried out, the average difference being 1 second. Because of slight variations in the lung extract, and in order to compare results obtained from day to day in the same patient and in different patients, the "prothrombin index" (Quick *et al.*, 1935) was determined as follows:

$$\text{Prothrombin index} = \frac{\text{Unknown prothrombin time in secs.}}{\text{Normal control prothrombin time in secs.}} \times 100$$

The normal range is 90 to 110. The results are expressed as a percentage of normal..

* Fresh ox-lung extract was used as a source of thrombokinase and was prepared by the method described by Smith *et al.* (1939). This extract lost much of its potency in two to three days if kept at room temperature. This period was extended to three to five days if stored at 9° C., but if immediately placed in the freezing chamber of the refrigerator it retained its activity at least four weeks after preparation. By this time the stock had usually been exhausted. The lung extract, in saline, was stored in fifty small glass tubes of about 1.5 c.cm. capacity, sealed, and immediately frozen. A tube was taken from the refrigerator before it was required to carry out a test.

Personal Observations

This paper describes an investigation of prothrombin deficiency and haemorrhage in obstructive jaundice, biliary fistula, catarrhal jaundice, and cirrhosis of the liver; and the treatment of prothrombin deficiency in some of the patients with a new water-soluble preparation. Finally the possibility of a liver function test based on prothrombin estimations is briefly discussed.

Thirty-five patients have been studied, and repeated determinations of the prothrombin index and quantitative van den Bergh reactions were made in all, and in addition the platelet count (Gram's method modified, Reid, 1940), the bleeding-time (Duke, 1915), the capillary resistance test (Göthlin, 1937), and the coagulation time (recalcifying oxalated blood, Quick *et al.*, 1935) were carried out in three patients with post-operative haemorrhage. In 16 cases definite prothrombin deficiency was found, and these were selected for treatment with synthetic naphthoquinone preparations in order that the efficiency of the drug could be determined. Of these patients 8 received 2-methyl-1:4-naphthoquinone† in peanut oil by intramuscular injection, and 8 were given the new 2-methyl-1:4-naphthohydroquinone disuccinate‡ by intravenous injection. Daily prothrombin estimations were carried out three to five days before and seven to ten days after treatment, and samples of blood were also taken four hours after giving the drug in order to determine how quickly it acted. For convenience of description the patients have been grouped as follows:

1(*a*) Obstructive Jaundice due to Neoplasm

Fifteen patients have been studied—seven males and seven females. The age range of the patients was 29 to 74 years, with the maximum age distribution about the sixty-fifth year. The duration of jaundice before investigations were carried out was two to twenty-two weeks, and the degree of jaundice varied between 11 and 32 mg. of bilirubin per 100 c.cm. plasma.

Before Operation.—The prothrombin index in patients before operation ranged from 31 to 100%, and averaged 65%. Slight prothrombin deficiency was occasionally found when the plasma bilirubin was below 20 mg./100 c.cm., but in most of these patients the prothrombin index was within normal limits. When the amount of bilirubin exceeded 25 mg./100 c.cm. plasma, prothrombin deficiency was always found, and was more pronounced the more the bilirubin in the blood increased above this level—i.e., the more complete the biliary obstruction became and the smaller the quantity of bile entering the intestine. The patients on whom these investigations were carried out were all taking satisfactory diets, including green vegetables, so the dietary intake of fat-soluble vitamin K might be assumed to be adequate. Further, it was found by the American workers and Illingworth that vitamin K concentrates and 2-methyl-1:4-naphthoquinone given by mouth had no effect on the low prothrombin levels in obstructive jaundice and biliary fistula unless bile salts were given by mouth at the same time. Hence the correlation between the degree of prothrombin deficiency and the lack of bile entering the intestine supports the view of the above workers that entry of insufficient bile salts into the intestine, with consequent deficient absorption of vitamin K, is the main cause of the fall in the prothrombin level in obstructive jaundice and biliary fistula.

After Operation.—Marked prothrombin deficiency was encountered in patients after operation, in association with

† 2-methyl-1:4-naphthoquinone supplied by Glaxo Laboratories Ltd. under the trade name kapilon.

‡ 2-methyl-1:4-naphthohydroquinone disuccinate supplied by Roche Products Ltd.

much slighter degrees of obstructive jaundice (e.g., 10 mg. bilirubin per 100 c.cm. plasma). This always occurred, whether it was an exploratory laparotomy or an operation to relieve biliary obstruction. In seven such patients a pronounced prothrombin deficiency developed from the second to the sixth day, the prothrombin index being reduced from 5 to 25% in the first twenty-four hours and from 20 to 50% between the second and the sixth day. (These figures tend to under-estimate the actual results, since treatment was not long delayed after the prothrombin index fell below 50%.) Four possible factors which might account for this considerable post-operative fall require consideration: (1) utilization of prothrombin for coagulation of blood during and immediately after operation; (2) a toxic effect of the anaesthetic on the liver; (3) lack of vitamin K, due to defective absorption from the intestine; (4) deficiency of the vitamin in the post-operative diet.

The first of the above factors was shown to be unimportant, because equally low figures were obtained just before and one to three hours after operation. With regard to the second factor, the seven patients showing the marked post-operative fall responded immediately to treatment with naphthoquinone preparations and the prothrombin index rapidly returned to normal; hence liver damage, while it may be a contributory factor, does not appear to play an important part in producing post-operative deficiency. The third factor—interference with the absorption of vitamin K through the absence of bile salts from the intestine—has just been discussed as a cause of prothrombin deficiency. Four of the seven patients referred to above underwent anastomotic operation for the relief of biliary obstruction. The stools were fairly well coloured before operation, but were even darker on the second and third days afterwards. The maximum fall in the prothrombin index occurred on an average on the fourth day, so that if bile salts were being excreted along with the pigment failure of absorption of vitamin K would not be due to this cause. The fourth factor, deficiency of vitamin K in the post-operative diet—so far as it may be assessed at present—was found to exist, since green vegetables (the only known source rich in the vitamin) were not taken for at least one week.

It would therefore appear that a deficient intake of vitamin K may be important in causing the pronounced post-operative fall in the prothrombin index, but a definite statement on the question must await further investigation.

1(*b*). Non-malignant Obstructive Jaundice

Eight patients, 7 females and 1 male, have been studied. Their ages ranged from 38 to 75 years. Six had chronic cholecystitis with gall-stones, 1 had a post-operative stricture of the common bile duct, and 1 had chronic pancreatitis. All were jaundiced, but not deeply (3 to 7 mg. bilirubin/100 c.cm. plasma), when observations were made.

Before operation the prothrombin index was never below 75%; in 7 it ranged between 80% and 95%. Six patients underwent operation: 4 for removal of gall-stones, 1 for stricture of the common bile duct, and 1 had an exploratory laparotomy. In 4 the prothrombin index ranged between 75% and 80% in the first two days after operation, but thereafter normal values were found. In another patient it fell to 57% on the fourth day, and in the sixth patient it fell to 25% after one week, when haemorrhage from the wound was observed.

Prothrombin deficiency was considered to be due to the causes discussed in dealing with the malignant obstructive jaundice group.

2. Biliary Fistula

There were two patients in this group; their cases are here recorded.

Case 1.—A married woman aged 59 had a cholecystectomy performed for chronic cholecystitis with gall-stones. A complete biliary fistula developed after this operation. Her diet was satisfactory, but the prothrombin index was only 52% after the fistula had been present for ten weeks. On the day following an operation to close the fistula it fell to 36%; 15 mg. of the intravenous preparation was given, and within twenty-four hours the prothrombin index had risen to 88%.

Case 2.—A married woman aged 52 developed a biliary fistula following cholecystectomy for chronic cholecystitis. A repair operation four months after removal of the gall-bladder failed, and a fistula developed, associated with slight obstructive jaundice (immediate direct van den Bergh and 5 mg. bilirubin/100 c.cm. plasma). The stools were light in colour and bile was present in the urine. The prothrombin index was 80% after the condition had been present for eight months, and showed little variation over a period of three weeks. Two days after intramuscular injection of 15 mg. of 2-methyl-1:4-naphthoquinone the prothrombin index was 103%. A second repair operation was successfully undertaken, further treatment having been given the previous day. Despite the fact that the patient was unable to take anything but fluids for the week following operation the prothrombin index never fell below 90%.

No haemorrhage occurred in either of these patients. In the first a biliary fistula prevented sufficient bile salts entering the intestine, with the result that adequate amounts of vitamin K, though present in the diet, were not absorbed, hence the low prothrombin values. The second had a partial fistula and slight obstructive jaundice, but enough bile salts entered the intestine to prevent serious prothrombin deficiency developing. Pre-operative treatment prevented the usual fall in the prothrombin index after operation.

3. Catarrhal Jaundice

Six patients with catarrhal jaundice were subjects of investigation. There were 3 males and 3 females, and the ages ranged from 19 to 30 years. Two suffered from a mild, 3 from a moderate, and 1 from a severe attack of the disease. The prothrombin index was never below 90% and the plasma bilirubin was 5 and 10 mg. per 100 c.cm. respectively in the 2 patients with the mild form of the disease. In the patients with the moderate attack the lowest prothrombin indices were 80%, 72%, and 65%, and the plasma bilirubin was 18, 9, and 7 mg./100 c.cm. respectively. The prothrombin index was 20% and the plasma bilirubin 35 mg./100 c.cm. at the height of the disease in the patient with severe clinical manifestations. He also had extensive subcutaneous haemorrhages and haematomata on the arms, legs, and abdomen, though external haemorrhage did not occur. His diet was good and the rapid improvement in the prothrombin index (20% to 90% in three days) without extraneous vitamin K therapy coincided with the appearance of bile in the stools, though the plasma bilirubin was still 32 mg./100 c.cm.

The prothrombin deficiency in patients with slight jaundice may be due to a toxic effect on the liver, since they were taking a satisfactory diet and bile was known to be entering the intestine. In the patient with marked prothrombin deficiency failure to absorb vitamin K appeared also to be important, since the prothrombin index rose rapidly after the stools were coloured.

4. Cirrhosis of Liver

Investigations were carried out on 4 patients—2 males and 2 females. Their ages ranged from 46 to 65 years. Slight icterus (2 to 4 mg. bilirubin/100 c.cm. plasma) was present in 3, and the stools were well coloured in all 4. The amount of prothrombin in the blood was always moderately reduced, and the prothrombin index ranged from 65% to 80%. On an ordinary mixed diet the level tended to fluctuate between these figures over a period of 3 to 6 weeks. Normal values were never reached, and there was practically no response to parenteral administration of the vitamin K preparation (see Fig. 4).

Post-operative Haemorrhage

Three patients with obstructive jaundice developed post-operative haemorrhage from their wounds. There was no bleeding into the skin or from mucous membranes. A brief clinical outline of their conditions will be given.

Case 3.—A man aged 27 complained of abdominal pain and vomiting after food for ten weeks, and jaundice for two weeks. He was poorly nourished and a mass was palpable in the epigastrium. The stools were light in colour and the urine contained bile. The plasma gave an immediate direct van den Bergh reaction, with 11.5 mg. bilirubin/100 c.cm. On the day before an exploratory laparotomy the prothrombin index was 76%. At operation an inoperable retroperitoneal sarcoma was found, and the wound was carefully closed. Throughout the day after operation he suffered from marked abdominal discomfort and vomiting, resulting in restlessness. In the evening of the same day it was noticed that his dressing was blood-stained and that a general ooze was coming from the wound. After changing the dressing the haemorrhage stopped until the afternoon of the second day, when the prothrombin index was 50%. The platelet count, the bleeding-time, and the capillary resistance test were normal. The coagulation time was slightly prolonged. Ten mg. of 2-methyl-1:4-naphthoquinone was given intramuscularly, and twenty-four hours later, though he was still restless and vomiting, the haemorrhage had stopped and the prothrombin index was 94%. He died on the fourth day after operation. A post-mortem examination was not carried out.

Restlessness, retching, and vomiting, by putting an extra strain on the wound, was probably the main factor in causing the early onset of haemorrhage, and the fact that it was intermittent is probably a reflection on the slight prolongation of the coagulation time.

Case 4.—A man aged 67 complained of jaundice of three days' duration. He was well nourished and took his food well. The stools were brown in colour and the urine contained bile. The plasma gave an immediate direct van den Bergh reaction and contained 8.5 mg. bilirubin/100 c.cm. Before operation the prothrombin index was normal (90 to 96%). A cholecystoduodenostomy was performed for a carcinoma of the head of the pancreas, and twenty-four hours after operation the prothrombin index was 75%. It gradually fell until the fifth day, when it was 55%, and the coagulation time was moderately prolonged. The platelet count, the bleeding-time, and the capillary resistance test were normal. In the evening of this day haemorrhage from the wound was noticed, and later his extremities were cold and he became collapsed. Haemorrhage was more or less continuous for forty-eight hours. The haematocrit reading before the haemorrhage was 40%; afterwards it was 32%, so that probably at least one-fifth of the red cells were lost. The response to treatment is shown in Fig. 3. Satisfactory progress was made until the tenth day; then he became drowsy and dehydrated, and died on the fifteenth day after operation. A post-mortem examination was not performed.

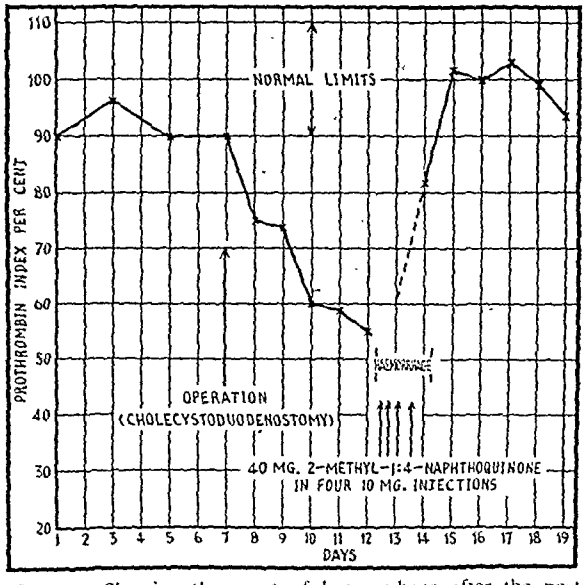


FIG. 3.—Showing the onset of haemorrhage after the post-operative fall in the blood prothrombin and the immediate response to treatment with synthetic vitamin K.

Case 5.—A woman aged 46 complained of intermittent attacks of pain in the right hypochondrium, shivering, and jaundice for the past twelve years. Bile was present in the urine, but the stools were well coloured. The van den Bergh test gave an immediate direct reaction of 6 mg. bilirubin/100 c.cm. plasma. A diagnosis of chronic cholecystitis with obstructive jaundice due to gall-stones was made. A hypochromic anaemia was also present (Hb. 52%; R.B.C., 3,470,000/c.mm.; C.I., 0.73; haematocrit, 30%; W.B.C., 7,200/c.mm.), which was treated successfully with iron. Before operation the prothrombin index was 75%: the platelet count, the bleeding-time, the capillary resistance test, and the coagulation time were normal. A stone was removed from the common bile duct and the gall-bladder was drained. Late in the evening of the sixth day after operation a slow ooze from the wound was first noticed; this continued overnight, and by 10.15 the next morning the patient's extremities were cold and she was collapsed. The prothrombin index was 25% and the coagulation time was much prolonged. The bleeding-time and capillary resistance test were normal. At 10.30 a.m. she was given 15 mg. of 2-methyl-1:4-naphthoquinone intramuscularly, and four hours later the prothrombin index was 75%, the coagulation time was normal, and the haemorrhage had ceased. On the eighth day the prothrombin index was 94%. The subsequent course was uneventful.

Haemorrhage and Prothrombin Deficiency

Haemorrhage associated with prothrombin deficiency has been described in newborn infants, in idiopathic steatorrhoea (Kark *et al.*, 1940), and in hepatic and biliary disease. It may be manifested by ecchymoses, haematomata, and haemorrhage from mucous membranes and even into joints, but it occurs most often from operation wounds (Illingworth, 1939b).

When haemorrhage began in the three cases just described the prothrombin index was 50%, 55%, and 25% respectively. Three patients with obstructive jaundice and one with a biliary fistula showed prothrombin indices of 24%, 26%, 27%, and 36% after operation and yet no haemorrhage occurred. It would therefore appear that there is no constant relation between the degree of prothrombin deficiency and the occurrence of haemorrhage from the operation wound. This statement may be explained by considering that before any serious capillary haemorrhage can occur two conditions must be fulfilled: (1) rupture of the vessels; and (2) an upset in the mechanism for securing haemostasis. Prothrombin deficiency, by interfering with the coagulation of blood (a process of importance in stopping haemorrhage), will thus not necessarily result in haemorrhage, but if rupture of the vessels occurs this interference with the coagulation mechanism will prolong the bleeding. Trauma is suggested as the most frequent cause of rupture of the vessels, since no defect in the capillaries was found, as judged by the capillary resistance test. This is supported by the frequency of haemorrhage from the operation wound, which is a "weak spot" and so more liable to bleed from minor injury.

A Comparison of Haemorrhage in Jaundice and Haemophilia

Four patients with haemophilia were studied. The platelet count, the bleeding-time, the capillary resistance test, and the prothrombin index were normal and the coagulation time was prolonged (4 to 8 times normal).

In the three patients with obstructive jaundice who developed haemorrhage the platelet count, the bleeding-

time, and the capillary fragility test were normal. The prothrombin index was subnormal and the coagulation time was prolonged in proportion to the degree of prothrombin deficiency—e.g., it was four times normal when the prothrombin index was 25%.

It is suggested, from these observations and the clinical manifestations of haemorrhage in the two conditions, that there is a close analogy between haemophilia and haemorrhage in jaundice. A defect in the coagulation of blood exists in both and trauma is the usual determining cause of haemorrhage. The essential difference between the conditions rests in the particular upset in the coagulation mechanism—in the one a prothrombin deficiency and in the other an unknown congenital defect.

Treatment of Prothrombin Deficiency

The object of treatment is to raise the prothrombin index to the normal level of 90% to 110% in order to correct the defect in the coagulation of the blood. The results are shown in the accompanying table. All the

Table showing Effect of Treatment on the Prothrombin Index

Condition	Preparation and Dose		No. of Cases	Prothrombin Index: Before Therapy	Prothrombin Index: 4 Hours after Therapy	Time to Reach Normal (Days)
Obstructive jaundice due to neoplasm	I.M.	10 mg.	6	27–64	}*	3
	I.V.	10 mg.	6	24–53	}	2
Non-malignant obstructive jaundice	I.M.	10 mg.	1	57		1
	I.V.	15 mg.	1	25	75	1
Biliary fistula	I.M.	15 mg.	1	88	—	2
	I.V.	15 mg.	1	36	62	1
Cirrhosis of liver	I.M.	10 mg.	2	60 & 71	62 & 70	No significant change after 7 days
	I.V.	10 mg.	2	70 & 80	71 & 82	

I.M. = Intramuscular. I.V. = Intravenous.

* Six patients had prothrombin indices under 40% before treatment. In three of them an increase of 15 to 30% was observed four hours after giving the intramuscular preparation, and in the others an increase of 25 to 50% four hours after the intravenous preparation.

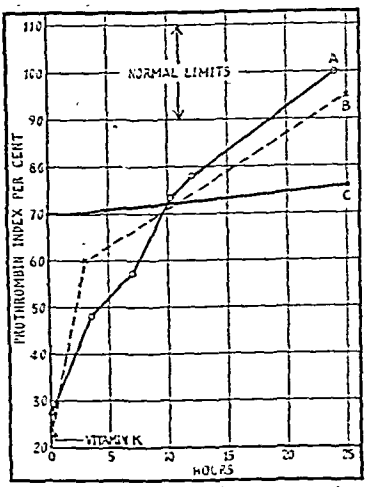


FIG. 4.—Illustrating the rapid improvement in the prothrombin index, after synthetic vitamin K, in two patients with obstructive jaundice due to carcinoma of the head of the pancreas and the insignificant response in a patient with cirrhosis of the liver. A = Carcinoma of head of pancreas: 10 mg. vitamin K intramuscularly. B = Carcinoma of head of pancreas: 10 mg. vitamin K intravenously. C = Cirrhosis of liver: 10 mg. vitamin K intravenously.

patients except those with cirrhosis of the liver responded to treatment (Fig. 4). The marked activity of 2-methyl-1:4-naphthoquinone in increasing the amount of prothrombin in the blood has been confirmed, and it may be concluded that the new intravenous preparation is at least as potent as this drug. The intravenous drug appears to be more rapid in its action than the intramuscular one, but for a prolonged action the latter is probably to be preferred. Definite conclusions on the dosage and the time for the maximum response could not be made, but the results suggest that a more rapid increase in the prothrombin index occurs when the larger doses are given. No toxic effects were encountered with either of these preparations, but two patients complained of pain at the site of intramuscular injection.

In preparing a jaundiced patient for operation prothrombin estimations will decide whether treatment is necessary or not. If these estimations are not carried out during the first week after operation it would seem advisable to administer some active form of vitamin K as a routine in view of the marked fall in the amount of prothrombin which may occur during this dangerous period. For this purpose a depot dose of 15 to 20 mg. of 2-methyl-1:4-naphthoquinone intramuscularly on the day of operation is suggested.

Blood Prothrombin Levels and Liver Efficiency

Suggestions have been made that the amount of prothrombin in the blood may be used to assess liver function, and recently Wilson (1940) has reported a relation between the hippuric acid liver-function test and blood-prothrombin levels. The failure of the patients with cirrhosis of the liver to respond to treatment (see table) may be ascribed to liver inefficiency, since, as previously mentioned, the only known conditions affecting man in which prothrombin deficiency does not respond to vitamin K therapy are associated with severe liver damage. Similar results have been reported by Butt *et al.* (1940) in three patients with cirrhosis.

Laevulose-tolerance tests carried out on three of the four patients in whom the above investigations suggested liver inefficiency were normal. Later two of these patients died, and post-mortem examination revealed advanced cirrhotic changes. Thus it may be that the failure of naphthoquinone preparations to increase the subnormal amounts of prothrombin in the blood in patients suffering from chronic hepatic disease such as cirrhosis may prove to be a valuable index of liver inefficiency. This matter is being investigated, and it is intended to make it the basis of a subsequent communication.

Summary

The importance of vitamin K in the prevention and treatment of haemorrhage in hepatic and biliary diseases associated with jaundice has now been fully recognized. The present investigations support previous work indicating that defective absorption of vitamin K due to absence of bile salts in the intestine is chiefly responsible for prothrombin deficiency in obstructive jaundice and biliary fistula prior to operation.

It is suggested that prothrombin deficiency after operation in these conditions—a deficiency which is often pronounced—may be due to a deficient intake of vitamin K in the restricted post-operative diet. Routine pre-operative administration of vitamin K is recommended.

The prothrombin deficiency in cirrhosis of the liver is considered to result from imperfect utilization of vitamin K by the liver.

Prothrombin deficiency is not, even when severe, always associated with haemorrhage. It is considered to be responsible only for the prolongation of haemorrhage after it has been caused by other factors, especially injury.

A new water-soluble preparation (2-methyl-1:4-naphthohydroquinone disuccinate), injected intravenously, has been found

to be as efficient as 2-methyl-1:4-naphthoquinone in increasing the amount of prothrombin in the blood when there is a deficiency. Moreover, the action of this preparation appears to be more rapid though less sustained than the latter. It has one minor disadvantage in that it is not stable for long in aqueous solution, and so has to be dissolved in water immediately before use.

A close analogy between haemorrhage in jaundice and haemophilia has been made. In both an upset in the coagulation mechanism exists, which is due in the one to prothrombin deficiency and in the other to an unknown congenital defect.

The failure of the patients with cirrhosis of the liver to respond to naphthoquinone preparations suggests that prothrombin estimations may form the basis of an additional test of hepatic insufficiency. This possibility is being explored.

A simple apparatus for determining the coagulation time and prothrombin time has been illustrated and a method of preserving lung extract, used as a source of thrombokinase, has been described.

I wish to thank Profs. J. W. McNee and C. F. W. Illingworth for advice and criticism, the physicians and surgeons of the Western Infirmary for permission to examine and treat the patients under their care, and Glaxo Laboratories Ltd. and Roche Products Ltd. for supplies of vitamin K.

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The committee of the Royal Melbourne Hospital has accepted responsibility for the erection of a new building for the Walter and Eliza Institute of Research in Pathology and Medicine, now in its twenty-first year. The building will provide additional laboratory space and greatly improved facilities. Meanwhile the annual report of the Institute chronicles a large amount of work, some of it routine investigation and some of it called for by the special demands of the war, in the virus department, the biochemical department, and the departments of clinical and neuropathological research. Much of the work has already been published in Australian journals. Last year the Institute started a blood bank, the only one so far established in Melbourne, to meet emergency blood transfusion requirements. A considerable part of the Institute's work has been the determination of the blood groups of nearly 13,000 troops of the A.I.F. in camp in Victoria. Research has also been undertaken on changes observed during storage of blood, and on the treatment of anuria following incompatible blood transfusions. Endeavours have been made to find a solution which, when injected intravenously in small amounts, will cause rapid alkalinization of the urine. A dose of 20 c.cm. molar sodium lactate solution shifts the *p*H of urine to the alkaline side and maintains it there for half an hour, and it is thought that it may be possible to produce more significant effects with larger doses or more concentrated solutions.

EXPERIENCES IN THE RECEPTION AND TREATMENT OF AIR-RAID CASUALTIES

BY

JOHN ROBERT LEE, M.D., B.S., F.R.C.S.

These notes cover a period of two months when intensive enemy air raids occurred over London. During this period 227 patients came under my care and supervision. Many of us have seen and treated badly injured civilians brought to hospital as the result of road, railway, or works accidents in peacetime. It seems to me, however, that only those who have had to deal with victims of air raids can conceive the appalling condition and appearance of many of these patients on their arrival in hospital. A sight which must be seen to be appreciated fully is the almost indescribably filthy condition of many who evidently had been clean and well clad. A patient is brought to the receiving ward with her clothes cut and torn to shreds, her hair singed, filled with dirt, and matted with blood and cement dust, her body and limbs covered with grit and oil, her face blackened, bruised, and bleeding, her eyes, nose, lips, and ears filled with dirt, her head bandaged, and her limbs immobilized by improvised splints at the first-aid post. Truly it is a picture not easy to forget. Most badly injured patients had been given 1/4 grain to 1/2 grain of morphine; the latter seemed too big a dose. Their ages varied from an infant a few hours old, born and bombed on the same day, to a man aged 92. There were twelve children under 14 years and twenty-six patients over 70. Thirty-six patients were dead or moribund on arrival in the receiving-room. The other patients were classified as follows:

Group 1 consisted of those so terribly injured that they died within an hour of arrival.

Group 2 patients were a few so badly hurt and shocked that they died notwithstanding most prompt measures taken for their resuscitation. Two of these were in so much pain that morphine and other usual sedatives failed to relieve. The administration of repeated short inhalations of chloroform was found to be the only way to calm these patients and to relieve their agony.

Group 3 was made up of those suffering from severe shock and loss of blood. These responded to blood transfusion, other resuscitation measures, and good nursing. After some hours—up to twenty-four—they were in a fit condition to be operated on, and made a good recovery. Some in this group had shattered limbs or had lost part of a limb. Others had head injuries with open or closed fracture of the skull. Three had protrusion of brain substance. All three recovered. Four patients had fractured spine. Two had penetrating abdominal wounds. Others suffered from severe burns.

Group 4 included patients less severely injured. They had large lacerated wounds or open or closed fractures, but shock was not so marked.

Group 5 comprised patients suffering with multiple small cuts, abrasions, and bruises.

Our Routine

Faced for the first time with conditions as described, we evolved and adopted the following routine plan. The patient was at once assured he would be safe and well cared for; those who were distressed because they could not see owing to dirt, swelling, or eye injury were told not to fear going blind. Their eyes were thoroughly cleansed and castor-oil instilled at once, and their lips and mouths were also cleaned. The patients then had a

cup of fresh tea with sugar. Antitetanic serum was given to all the wounded. Brief notes were written and any such treatment was recorded on the case sheet, especially if morphine had been administered at the first-aid post. The patient was then sent to the ward. The nursing staff carried out their duties efficiently, often working on far into the night after a long day. Patients well enough were removed from the stretchers and put to bed. Several of those in one of the first three groups were too ill to be moved off the stretchers for some hours. As soon as such a patient arrived in the ward all special measures for resuscitation were begun, and carried out, by the hospital staff and by special teams, whose skill and untiring efforts saved many lives and enabled us to operate and to obtain good results.

Three patients who were very ill and had been given several pints of blood responded very well indeed, then after a few hours they suddenly showed pronounced signs of apparent collapse, with profuse cold clammy sweat, dilated pupils, rapid very feeble pulse, and restlessness. A hypodermic injection was given consisting of morphine grain 1/4, strychnine grain 1/60, and atropine grain 1/100—the tablet known as M.S.A.—with a good result in each case.

All wounded patients were given the full prescribed course of sulphapyridine with the usual routine hygienic and dietetic measures, combined with good nursing. We soon evolved the following method in cases of injuries to the head or limbs with extensive lacerated wounds.

Patients when well enough to be operated on were given preliminary medication, including 1/100 grain of atropine, and taken to the theatre still on the stretchers on which they were admitted. A general or more often an intravenous anaesthetic was administered: then what we termed a "cleansing squad," which included a doctor, sister, nurse, and one or two attendants, removed the patient's clothes, and thoroughly cleansed the injured parts with ether soap and hot water over a large flat dish and mackintosh. In wounds of the head the hair was cut away. The area adjacent to the wound on the scalp or a limb was shaved, washed with a solution of dettol, and placed in a suitable position on sterile towels. The surgeons were then able to operate with reasonable aseptic and antiseptic care. The area adjacent to the wound was painted with dilute tincture of iodine. Wounds were carefully examined and explored, and foreign bodies and debris were removed. Skin edges and other damaged tissues, especially devitalized muscle, were excised. In a few cases sulphanilamide powder was freely placed in the wound, which was then closed by sutures somewhat widely placed and without tension. Rubber tubing or other material was not used for drainage. Suitable dressings were applied and, if necessary, as in a bad wound of a limb, local rest was obtained by the use of a splint for a few days. We found it a good plan in some cases when a patient had multiple wounds, say of head and a limb or two limbs, for two surgeons to operate on the patient, each doing one part, and so lessening the time the patient was under the anaesthetic. The results were gratifying.

Use of Glycerin and Iodine

From experience gained from dealing with those injured in railway and road accidents during recent years, I treated nearly all wounds by using glycerin and iodine instead of sulphanilamide. Our records show uniformly good results. We proved the value of the method in this series. It must be obvious that many wounds cannot be thoroughly excised. Three cases serve to illustrate this point very well.

A young man had a three-inch curved wound along the lower margin of his left orbit which extended deeply into the antrum. The skin was excised, and debris and small foreign bodies and fragments of loose bone were curetted out by using gauze on an artery forceps. The cavity was filled with glycerin and iodine and the wound was closed with a subcuticular suture. After suture the wound was painted freely with the solution. No dressings were applied. The wound healed without any complication. The patient was transferred to a base hospital, and returned to us for discharge within fourteen days of the injury.

Another case was that of a middle-aged woman who had a four-inch oblique wound which extended from near her right external orbital process, with a fracture of the upper jaw, through the zygoma into the pterygoid fossa. Exactly similar treatment was given with an equally good result.

A third patient, a girl aged 15, apparently had a large glass tumbler blown through her left shoulder. Nearly all of the body of the scapula, its neck, glenoid cavity, acromion, and coracoid, the outer third of the left clavicle, and the head and upper three inches of the left humerus were blown away. Her left upper limb was attached to her body by its vessels, nerves, and a band of skin about two inches wide. Her condition was desperate. The huge wounds in front of and behind what was her shoulder were filled freely with glycerin and iodine while resuscitation measures were being carried out. After thirty-six hours she was taken to the theatre and attended to as described herein. Portions of her coat and other clothes, with dirt and debris, were removed from the wounds, then more glycerin-and-iodine solution was constantly applied. Gas gangrene was feared, as cultures showed the presence of *B. welchii*. A dose of anti-gas-gangrene serum was given. She did not develop gas-gangrene. At the end of five weeks she was able to move her elbow, forearm, wrist, thumb, and fingers well. The wounds were almost healed, and her general condition was good.

Many patients had literally scores of wounds on the face, body, hands, and legs. Excision was out of the question. These were treated by having the wounds curetted with gauze soaked in glycerin and iodine. On the face no dressings were used. The wounds were frequently painted. The small scabs were shed in about a week. Multiple wounds of the limbs were painted, and a sterile towel was placed so as to prevent contact with the bedclothes. All such wounds healed in less than a fortnight with very little scarring. By this method healing takes place rapidly under a scab with little or no pus, usually in less than a fortnight. There are no repeated painful dressings. The growing tissues are not damaged. The circulation and local nervous mechanism are not interfered with by bandages or other material placed around a limb. Every effort was made to avoid amputation, usually with satisfactory result.

Treatment of Burns

Before the more recent instructions were issued concerning the treatment of burns with tannic acid, two patients, a man and his wife, had severe burns of the face, forearms, and hands. Tannic acid had been applied. We noticed the hard claw-like fingers beginning to develop. The patients complained of much pain in the finger-tips. Hence I treated the cases with zinc oxide cream, which was very freely applied. The patients said the pain ceased after two hours. The black eschars softened and then peeled off, and both patients made an uninterrupted recovery, now having full use of their hands.

Conclusion

On three occasions when we had many severe casualties a mobile team was sent to help us. We found that, while their help was valuable, the disadvantages were that they did not know the run of the hospital, and that the theatre staffs had not worked with them: hence there were difficulties and delays. We were badly bombed on three occasions, and so our telephone service was cut off just when we needed it most. From this cause difficulties of arranging transport and transfers to base hospitals arose. We found it best to keep Group 3 patients under our own

care and treatment. None of these developed gas gangrene or serious sepsis.

The courage and cheerfulness of the patients were most remarkable. For example, one woman about 52 years of age, when asked how she was, said: "Oh, I've only a few cuts and scratches"; and added, "Hitler can't get me; he bombed me once before and blew the roof off my house. I was downstairs this time. My house is now down flat, and I won't be there next time he bombs it." Visitors were allowed freely, but were warned that there were to be "no tears" while in the wards.

I wish to express my thanks to the medical superintendent and his staff, and to the nursing staff, stretcher-bearers, and scouts, for their constant help and real team spirit in great emergencies.

RENAL COMPLICATIONS OF SULPHAPYRIDINE

ACCOUNT OF A CASE WHICH SHOWED GROSS HAEMATURIA AND URAEMIA

BY

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Although haematuria is generally recognized as an occasional complication of sulphapyridine treatment it is a condition which has received little attention in the literature of this country. All the information that I have been able to glean has been culled from communications published in the United States and in Canada, and from a summary of part of this transatlantic work by R. St. A. Heathcote (1940). The object of this paper is to report a case in which haematuria and uraemia occurred, and to give a general description of the renal complications of sulphapyridine (Backhouse, 1939).

Case Report

A second lieutenant aged 26 was admitted to hospital on August 26, 1940, with follicular tonsillitis. He gave a recent history of three similar attacks. There was no elevation of pulse or temperature. He was put on to sulphapyridine and given gargles of potassium chlorate. The following day he felt better and his throat was less painful. On August 28 he vomited several times and passed 10 oz. of deeply blood-stained urine. The sulphapyridine, of which he had received a total dose of 12 grammes, was stopped. He passed 1 oz. of urine during that night, and in the early morning of the 29th had a severe attack of pain in the lower abdomen, which radiated later to the penis. During the day he passed only 5 oz. of urine, which was grossly blood-stained. He continued to vomit throughout the day, and still complained of pain in the abdomen and across the lumbar region. In the evening he was very drowsy.

On August 31 an intravenous "drip" saline was started, as he was vomiting intermittently and had passed no urine for forty-eight hours. At this time his tongue was dry and furred, and occasional hiccups had begun to add to his distress. He was tender in the left iliac fossa and left costo-vertebral angle, and slightly tender in the right iliac fossa. There was no evidence of oedema. A blood count showed Hb 90%; R.B.C. 5,500,000; W.B.C. 11,250—78% polymorphs, 15% lymphocytes, 7% monocytes. During the night he became restless and delirious. The "drip" was stopped on the morning of September 1, by which time he had received 4 pints of normal saline and 2 pints of 5% glucose in normal saline. At the end of the drip his mental outlook was rational and his tongue had become moist. He was still vomiting, but less copiously and less often, and had not yet passed urine. During the afternoon another intravenous "drip" was started, 1 pint of normal saline being followed by 2 pints of 5% glucose-saline, and the same evening he passed about 1/2 oz. of bloody urine after a period of anuria lasting seventy-two hours. The specimen of urine was examined by Major C. E. van Rooyen, who reported as follows: "Specimen consists of about 1/2 oz. of blood-stained urine—cloudy, dark, and with much amorphous granular sediment. Microscopical examination: Numerous R.B.C. and pus cells; no bacteria; no crystals of any sort visible." This urine was passed at 8.30 p.m. At 9 p.m. a solution of 4.28% sodium sulphate was substituted for the glucose-saline, and at 9.45 p.m. a further 6 oz. of urine was passed. By the following morning the patient had passed 82 oz. of urine. The "drip" was continued till the morning of September 3, by which time 8 pints of saline and glucose and 2 pints of sodium sulphate solution had been given. From now on his condition rapidly improved and gave rise to no further anxiety. On September 11 a centrifuged deposit of urine showed W.B.C. (average 20 per field), R.B.C. (average 6 per field), 4 epithelial casts, and 1 hyaline cast.

On September 17 an excretory pyelogram revealed no abnormality of outline or function. Tonsillectomy was performed by Major E. A. M. Connal on September 23, and the patient was discharged from hospital on October 4.

Incidence of Renal Complications

Plummer and Ensworth (1939) reported 4 cases of gross haematuria and 1 of microscopical haematuria in 323 patients treated with sulphapyridine. They also observed a mild degree of blood nitrogen retention in 3 patients who showed no haematuria. These authors maintain that in their experience of the toxic effects of sulphapyridine "those involving the kidneys and ureters have been the most disturbing." Duncan Graham of Toronto and his co-workers (1939) observed 4 cases of gross haematuria in 50 patients, Smith and Needles (1939) 1 case among 50; while Tsao, McCracken, Chen, Kuo, and Dale (1939) have reported 5 cases of gross haematuria in a series of 40 patients, but attribute this high incidence to the poor nutrition, dehydration, and avitaminosis which were features of most of their patients. Tsao's patients were children attending a hospital which admits only sick refugee Chinese. In the case of almost all the patients in these various series pneumonia had been the primary disease for which the sulphapyridine was given. My colleague Captain J. A. Scott (personal communication) has noted a case of gross haematuria among 74 patients treated with sulphapyridine for gonorrhoea.

We know from the work of Antopol and Robinson (1939) and of Gross, Cooper, and Lewis (1939) that urinary calculi composed of acetyl-sulphapyridine (64.1%) and sulphapyridine (6.4%) can be produced experimentally in monkeys, rabbits, and rats by the oral administration of large amounts of the drug; and two small stones of acetyl-sulphapyridine were found by Plummer and Ensworth at necropsy in the kidney of a woman who over a period of three months had received 540 grammes of sulphapyridine on account of a subacute bacterial endocarditis. It is important to bear in mind, however, that massive doses of the drug are not essential to effect its precipitation in the urinary tract. Plummer and McLellan (1940) found the crystals in the bladder of a man aged 46 who developed pain in the left flank and haematuria after 11 grammes, and in the case described above only 12 grammes had been given. Nor does this precipitation depend upon a high level of the blood sulphapyridine. In fact, in Plummer and McLellan's case the level was too low to be read.

Nature of the Renal Lesion

In their experimental animals Antopol and Robinson found changes ranging from a simple calculous pyelitis and ureteritis to a marked pyelonephritis. Tsao has reported the post-mortem appearances in a boy aged 5 who had died of uraemia after receiving 7.78 grammes of

sulphapyridine. The pelves and ureters were dilated and their mucosae thickened, congested, and haemorrhagic; the bladder contained a small amount of grey sandy particles, and both ureters were blocked by concretions at their entrance into the bladder. Unfortunately the sand-like material was lost in the fluids and could not therefore be examined for sulphapyridine. Stryker (1940) had the opportunity of examining at necropsy the renal lesion in a child of 5 months who had died of pneumococcal meningitis and had developed gross haematuria after 44.2 grammes of sulphapyridine, administered over a period of four weeks. In this case the mucosa of the urinary tract appeared normal. In the calices and pelves of both kidneys a small amount of yellowish-white gravel was found, and four calculi were isolated from the pelvis of the right kidney. Here, as in Tsao's case, there was an accumulation of gravel in both ureters, mostly at the entrance of the ureters into the bladder. Microscopically the kidneys showed dilatation of the cortical tubules and glomerular spaces due to precipitation within the tubules of concretions of varying structure—namely, sharp-edged basophilic crystals, amorphous basophilic debris, and discoid bodies of homogeneous material.

Diagnosis

When haematuria is observed in a patient to whom sulphapyridine is being administered it must always be borne in mind that the drug may be responsible, and the urine should be examined for crystals. The crystals are elongated and sharp, and occur in clusters grouped at one end and radiating at the other. They are well shown in a photograph reproduced in Plummer and McLellan's paper. It is worth noting that in Captain Scott's case the crystals could not be identified in the centrifuged deposit of the urine, but they could be seen clinging in abundance to the sides of the glass vessel and showed the typical structure under the microscope. The crystals were washed off the sides of the vessel, tested chemically, and identified as sulphapyridine by Miss Gilchrist of the biochemical department of the Royal Infirmary, Edinburgh. Unless concretions of acetyl-sulphapyridine are present in large quantities they are readily redissolved and cannot be identified in the urine. Southworth and Cooke (1939), for example, found them in the urine of only 1 of 3 patients who developed haematuria after sulphapyridine. Occasionally renal calculi of acetyl-sulphapyridine may be demonstrated as negative shadows in excretory or instrumental pyelograms (Plummer and McLellan, 1940). In spite of the sulphur-containing radical the stones themselves are not opaque to *x* rays. In the absence of crystals it may be difficult, and at times even impossible, to determine at the onset whether the haematuria should be attributed to the sulphapyridine or whether it is a symptom of an acute nephritis, since many of the patients under treatment with the drug are victims of acute infections in which nephritis is known to occur as a complication. If the bleeding is due to acute nephritis numerous casts in the urine or oedema or shivering attacks will eventually point the diagnosis. These symptoms are no more characteristic of renal damage due to sulphapyridine than they are of aseptic calculous pyelitis and ureteritis in general. Furthermore, the haematuria due to sulphapyridine is often accompanied by renal pain or colic which is far more severe than the lumbar pain that is an occasional feature of acute nephritis.

Occasionally pain precedes the appearance of haematuria, and Southworth and Cooke (1939) describe a case in which the possibility of an acute appendicitis was seriously debated. The patient was a girl of 17 who developed a transient attack of pain in the right lower quadrant of the abdomen two days after she had been started on a course of sulphapyridine for a respiratory condition. On the following day the pain recurred and was accompanied by burning pain on micturition. Tenderness was most marked over McBurney's point. Owing to the onset of gross haematuria and the fact that her abdominal tenderness extended up to the right costo-vertebral angle, conservative treatment was decided on, and the sulphapyridine, of which she had received 10.5 grammes, was stopped. Her symptoms subsided rapidly.

Treatment

As a rule the symptoms of haematuria and renal colic disappear within twenty-four hours when sulphapyridine is withheld and fluids are forced. In the event of signs of nitrogen retention 5% glucose or 4.28% sodium sulphate solution should be administered by the intravenous "drip" method. If anuria develops and persists in spite of these measures, cystoscopy and ureteric catheterization or, if need be, renal pyelotomy, as suggested by Tsao, deserve consideration owing to the tendency for plugs of concretion to block the orifices of the bladder. This was not carried out in the case I have described, as it was not until the patient had recovered that I had the opportunity of perusing the relevant literature and of learning something of the nature of the condition.

I wish to acknowledge my thanks to Colonel J. M. Mackinnon for permission to publish this record, and to Major C. E. van Rooyen for his friendly co-operation. My grateful thanks are also due to Major Ian Murray for much helpful discussion during its preparation.

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EXPERIENCES IN TREATMENT OF PERIPHERAL NERVE INJURIES WITH AMNIOPLASTIN

BY

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For some time efforts have been directed towards finding a substance which would isolate a damaged structure by preventing it adhering to its surroundings and which by ultimately becoming absorbed would leave the structure concerned quite free. Wilder Penfield and his associates (Chao *et al.*, 1940) experimented on cats by placing various membranous materials between the scarified cerebral cortex and a flap of overlying soft parts. They found that of the materials used the best was a prepared form of human amniotic membrane which they called amnioplastin. This was absorbed in about three weeks, leaving the cortex free from adhesion.

Following Penfield's report it appeared that this substance would be useful in the surgery of peripheral nerves as well as in that of the central nervous system. Having had some experience of it in eight intracranial cases in which it was used to prevent meningo-cerebral adhesions, and having noted the frequency with which peripheral

nerve lesions so far met with in the present war are due to the involvement of nerve trunks in scar tissue, I thought it desirable, after freeing such trunks, to attempt to isolate them by wrappings of amnioplastin. It is not proposed here to discuss the intracranial uses, but, in order to afford comparison with peripheral lesions similarly treated, an example is given of the type of cerebral case in which the membrane has been used.

Type of Cerebral Case

Old Gun-shot Wound of Head. Meningo-cerebral Adhesions: Traumatic Epilepsy

A fitter aged 51 had three years previously been shot through both frontal lobes with a large-calibre revolver bullet. Dense meningo-cortical adhesions anchored both frontal lobes and were regarded as responsible for his epileptic fits, which had developed subsequently to the shooting accident. On May 7, 1940, a large bone flap was turned down; the adhesions were separated by endothermy, and the frontal lobes were wrapped in amnioplastin. He has remained well and free from fits since.

Peripheral Nerve Cases

The membrane has been used in 12 cases of injury involving the following peripheral nerves: ulnar 2, median 4, musculo-spiral 1, great sciatic 2, external popliteal 3. Brief details of these cases are shown in the accompanying table. It is realized that these are early days in which to draw conclusions as to ultimate results, and I have not yet had an opportunity to reopen a wound and re-examine a nerve trunk that has been isolated by the membrane some time previously; but the results up to date are so encouraging in the incomplete lesions and cases of causalgia so far dealt with that it appears advisable to report our experiences.

Preparation, Preservation, and Method of Using Amnioplastin.—The amnioplastin has been prepared in the surgical unit at Cardiff by Mr. Charles Langmaid and members of the unit laboratory staff from placentas obtained from the obstetric department, in charge of Prof. Gilbert Strachan. The method of preparation has been that described by Penfield and his associates (Chao *et al.*, 1940; Penfield, 1940), and the membranes have been preserved in alcohol (70%), in stoppered bottles. Just before use—i.e., on the morning of operation—enough amnioplastin for what is intended is removed from its storage in spirit and boiled for half an hour in distilled water in a large beaker. After boiling, the amnioplastin, which is slightly cloudy when it comes out of spirit, is more transparent and is of a light green colour. It is not unduly fragile, is easily handled, and resembles rather thin oil-silk. It is taken from the beaker and floated on saline in a large bowl, when pieces may be cut to the requisite size and shape.

Technique of Use in Peripheral Nerve Cases.—The nerve trunk having been isolated and freed from scar tissue both above and below the level of the lesion, and bleeding having been attended to meticulously, so as to obtain a dry field, the site of the lesion (which may be a suture line, an area that has been strangled by dense fibrotic tissue, or a length of nerve anchored by numerous adhesions) is wrapped around by a suitably shaped piece of amnioplastin. This piece must be large enough to extend beyond the limits of the lesion in order to include some normal nerve trunk both above and below it and thus completely isolate it.

Results

Except in one intracranial case, that of a large recurrent meningioma, all wounds have healed by first intention. Results have been both gratifying and encouraging. Early functional restoration has been noted in most and a freedom from pain in all. The relief of pain, cessation of sweating, and early restoration of normal skin appearances in the two examples of causalgia have been particularly striking. It remains for the future to determine whether the late results of these peripheral cases are equally good, and for an opportunity to occur by which we may ascertain from the condition of the operation field whether neural isolation persists and whether the membrane is absorbed as completely in man as in experimental animals.

Table giving Details of Peripheral Nerve Lesions treated by Amnioplastin Isolation

Case	Age	Lesion	Operation	Date of Operation	Result
1	22	Ulnar. Bomb wound, forearm, Aug., 1940. Motor paralysis absolute; sensation lost over ulnar distribution	Freeing of nerve from dense adhesions. Wrapped in amnioplastin	20/11/40	Almost complete recovery within six weeks
2	20	External popliteal. Bomb wound, May, 1940. Drop-foot	Freeing of nerve from scar tissue. Wrapped in amnioplastin	26/11/40	Progressive recovery—not yet complete
3	27	Median at wrist. Causalgia. Cut tendons and nerve. June, 1940	Freeing of nerve from scar tissue; incision made into nerve. Wrapped in amnioplastin	26/11/40	Pain relieved, sweating ceased. Rapid recovery—incomplete
4	19	Median in arm. Musculo-spiral at elbow. Bomb wound at Dunkirk, May, 1940	Freeing of median nerve, which has been partially divided, from dense scar tissue	29/11/40	Slight improvement
5	26	Median just below elbow, following crush of arm in watertight door and fracture of ulnar, Sept., 1940	Nerve found to be embedded in extremely dense scar tissue. Nerve freed and wrapped in amnioplastin	20/12/40	Much recovery in short time
6	20	Median at wrist. Bomb wound of forearm, May, 1940. Causalgia	Neuroma involving median and tendon of flexor carpi radialis. Neuroma dissected off nerve., Incisions into trunk of nerve	2/1/41	Pain relieved. Recovering
7	23	Great sciatic in buttock and comminuted fracture of great trochanter by machine-gun bullet, Aug., 1940	Nerve exposed and found to be partly destroyed at its exit from pelvis; much scar tissue around it. Freed; isolated in amnioplastin	31/1/41	No change
8	28	External popliteal and fracture of fibular neck, Nov., 1940	Exposure of nerve and isolation in amnioplastin	17/2/41	Recovering rapidly
9	21	Musculo-spiral. Wrist-drop following inoculation with T.A.B., Oct., 1940	Exposure of nerve; separation of adhesions; isolation in amnioplastin	25/2/41	Recovering
10	20	Great sciatic in buttock. Injury by injection into nerve, June, 1940	Perineuritis. Isolation in amnioplastin	7/3/41	Recovering
11	19	External popliteal lesion and fracture of fibula by bomb explosion, Jan., 1941	Nerve found divided; proximal neuroma. Neuroma excised; end-to-end suture with knee flexed; amnioplastin isolation	27/3/41	No change as yet
12	35	Fractured surgical neck of humerus; damaged median and ulnar trunks. Accident at sea, Dec., 1940	Perineuritis and myositis ossificans. Isolation of nerve trunks with amnioplastin	29/3/41	No change as yet

Conclusion and Summary

Amnioplastin appears to be a valuable material for the isolation of nervous elements. Its use so far in the surgery of peripheral nerves has been encouraging, relief of pain and restoration of early function being noted in cases in which it has been used after freeing nerves strangled in scar tissue.

Experience in the use of amnioplastin has been obtained in 8 intracranial cases, 12 peripheral nerve cases, and in one or two additional instances, such as a scar in the popliteal space. The type of peripheral nerve case in which the membrane has been used, the method of its employment, and the results so far obtained are here reported. These results are so encouraging as to suggest its continued and further use.

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A HISTORY OF THE RESCUE AND AFTER-CARE OF TWO CASES AFTER FOUR DAYS' BURIAL

BY

G. S. SWAN, M.B., Ch.B.

On a Thursday, at 1 a.m., a bomb struck a block of three-storied cellared houses. Some of these houses were completely destroyed. As it was known that a number of people were in them at the time of the disaster rescue work started almost at once, but with little hope of saving anyone alive. At 6 p.m. on Friday an elderly woman was rescued alive, but in such a serious condition that she died a few days later.

The First Rescue

At 7 p.m. on Sunday I was sent for, as the rescue squad had heard a voice under the debris. On arrival I made contact with the trapped girl, one of my own patients, Miss F. B., aged 21, whose voice could faintly be heard, obviously at some distance below the debris. She told me her name, that she knew her father and mother were dead, and that she was quite immobile except for a little movement of the left hand. It was astonishing to find her so completely intelligent, and throughout the six hours before she was finally removed at 1 a.m. on Monday—exactly ninety-six hours from the time she was first trapped—she retained her intelligence and was of great help in guiding the rescue squad in their difficult task.

At 9.30 p.m., debris having been removed entirely by hand and several wooden beams sawn through, a narrow hole four feet in depth allowed of contact with the girl's left hand. It was just possible to feel her pulse, which was well perceptible at about 90 beats per minute. A short time afterwards her head was uncovered, when it became obvious she was face downwards in position. By means of a length of rubber tubing and a feeding-cup we succeeded in getting her to rinse out her mouth, after which she was allowed to swallow a little hot well-sugared tea. Shortly afterwards, as more of her body became exposed, I gave her one-third of a grain of morphine, and about quarter-hourly sips of tea, by now out of the feeding-cup direct. By midnight she was completely exposed at the bottom of a deepish hole. The rescue squad also succeeded in burrowing sideways at her body level, a burrow sufficient to admit head and shoulders with debris supported by some flooring cross-beams. It was through this burrow that we succeeded in delivering her.

She was lying crouched, face down, her knees on her chest and heels under her buttocks, her right arm under her chest and left arm by the side of her face—a normal breech position. Across her back was the dead body of her father. It was evident we dared not remove him before the girl, so we arranged the rescue squad with one man from above easing up the dead body as much as possible, another down the main hole supporting the chin, and a third grasping her hips and gently pulling her through the small narrow side burrow. As she was being removed she told us there was a woman alive next door. Once on the warm stretcher I immediately straightened her legs and sent her to hospital, where all was in readiness for her reception.

The Second Rescue

On investigating her report that a woman was alive next door, we found, to our surprise, that this was true. After shouting we heard a voice say, "I am A. D. [aged 34]; I am all right, and walking about in the cellar. I have a baby with me, who is not very well, and we have some bottles of milk." This turned out to be delirium, and it was some hours before contact was made. It was then discovered that she was lying on the cellar stairs, her head higher than her feet, and completely immobile.

The only way to deliver her was through a narrow aperture formed by the absence of the upper panel of a door, the rest of the door supporting a mass of debris. It was impossible to risk cutting away the side of the door, but it was possible to remove a triangular piece of the lower panel. Her pulse was weaker than the girl's, but countable at about 100. She also received morphine, and was fed in a similar way to the first patient. The dead body of a 3½-year-old boy was lying under her right arm. To deliver her through this narrow aperture one man was able to step inside the hole and just scramble down to place both hands under her shoulders; another man, lying on the debris held by his heels, was just able to reach her legs. I lay over the aperture and, as she was eased upwards, succeeded in grasping her shoulders and bringing her out of the hole over my own right shoulder to stretcher-bearers behind. This was at 6 a.m. on the Monday, 101 hours after being buried. She also was immediately sent to hospital.

Treatment of the Patients

When admitted both patients were placed in warm beds with suspended cradle lamps and received a transfusion of two pints of plasma. Blood pressure on admission was: Miss F. B., systolic 85, diastolic ?; Miss A. D., systolic 90, diastolic ? 70. After transfusion both blood pressures were 140/80.

General Examination of Case I.—Severely shocked, but perfectly conscious and mentally very alert. Very thirsty. Eyes bright and free from grit; lips and tongue abrased and some dirt ingrained; air passages clear—no evidence of gritty lungs. A few small pressure sores on back and large area over sacrum. Full range of movement in upper limbs; small superficial patches of skin gangrene over patellae; both lower limbs stiff, and foot-drop present on left. One gramme of sulphanilamide four-hourly for forty-eight hours, followed by one tablet (0.5 gramme) four-hourly for four days. Frequent hot drinks taken very well. All pressure sores dressed with gentian violet; nursed on an air-bed; right foot splinted; rest of skin perfectly clear. Extremities were warm.

General Examination of Case II.—Severe shock; cold; mental condition incoherent with periods of delirium; very thirsty. Eyes clear; tongue dry; air passages clear—no evidence of gritty lungs. Bruising of both legs, with large gangrenous patch on right thigh posteriorly, lateral aspect of right leg, and above left outer malleolus; a smaller patch of superficial skin gangrene on right side of chest, also on both wrists posteriorly. Patient was not able to move either of lower limbs; the right leg and foot were oedematous, also right hand and arm. Warm fluids were

taken freely. All patches were treated with gentian violet, and sulphanilamide was given as in previous case.

Both patients also received 2,000 units A.T.S. Within twenty-four hours mental condition became perfectly clear; right foot-drop developed, and foot was accordingly splinted.

Subsequent History

Both patients steadily improved. No vomiting; solid food was begun on the third day, following an enema. On the fourth day both began to bend the affected knee; oedema steadily diminished. Urine, tested daily, revealed nothing abnormal, and the output was never less than 75% of intake. As in cases reported in the *Journal* of March 22, the non-protein nitrogen was estimated on both, and was found to be well within the normal limits—25 mg. per 100 c.cm. in one and 27 mg. in the other.

By the end of the week the oedema had practically disappeared; there had been no vomiting, the bowels were acting normally, blood pressure in both was 148/85, and fluid output was equal to intake. After ten days all gangrenous patches were separating at the edges, leaving clean granulating surfaces underneath. No oedema was present. Slight movement of the foot was noticed.

At this stage Miss A. D. showed evidence of slight left ulnar nerve injury with some median involvement, only fingers affected; the hand was splinted in dorsiflexion. At the time of writing, thirteen days after admission, this is already showing signs of clearing up, and the general condition of both patients is excellent. Stringent precautions have been taken all along, no visitors having been allowed until the eleventh day and the cradle lamps still being in use. Both are eating and sleeping normally, and there has been no change in their mental condition. They have not talked much of their experiences, nor have they as yet been questioned.

Commentary

These two cases raise several points of both general and medical importance. I have suggested to the municipal authorities that it would be of great advantage if some form of sound-detector could be employed on the site of a disaster as early as possible. Both patients state that whereas they could hear everything going on above them—and Miss F. B. says that her father was alive for two days and Miss A. D. that the child lived for nearly three days—their voices were not heard until sufficient debris had been removed nearly four days afterwards. The reason for and advantages of a sound-detector are therefore obvious. I suggest also that rescue work should be carried out on the assumption that people are alive though buried, and that work should be done in relays without ceasing. All ambulances should normally carry hot-water bottles (I used three of my own on this occasion) and six feet of rubber tubing with feeding-cup.

The important medical points that occur to one, bearing in mind the positions in which the patients were found and the length of immobility, are: (1) The severe limitation of oxygen supply, and the lack of fluid intake, both acting together, failed to produce the obvious mental and physical reactions. (2) The extraordinarily good condition of the skin and the warmth of the extremities. (3) The absence of irritation conjunctivitis. (4) The clearness of the air passages and the absence of gritty lungs. (5) The comparatively mild nerve-pressure paralysis.

I believe a doctor working in conjunction with the rescue squad is the ideal arrangement when there is any chance of rescuing people alive, and would stress the importance of some form of sound-detector and my belief that the dangerous period after prolonged burying is that between the moment when exposure takes place and the patient's arrival in hospital. Thus treatment on the lines already indicated should be instituted during the actual rescue. Lastly, I would support Prof. H. A. Harris in his criticism of over-treatment. Briefly put, the treatment of "crush cases" should provide a maximum of rest, both physical and mental; a maximum of warmth, both external and internal; and a minimum of interference.

I would like to thank my resident, Miss Walsh, and the nursing staff of the hospital, for their whole-hearted co-operation.

Clinical Memoranda

Oestradiol Benzoate in Hypoglandular Rheumatoid Arthritis

During the past season a number of female patients with rheumatoid arthritis had very limited time to complete a satisfactory course of spa treatment owing to home duties of an urgent nature. Six weeks would be an ideal course for the average case, but some patients could spare only two weeks, and less than three is of very little use.

In the early spring of 1940 I noticed that those who were taking small doses of oestradiol preparations or the synthetic substance stilboestrol for menstrual disorders showed remarkable improvement in coexisting hypoglandular rheumatoid arthritis. In all these cases I decided to supplement treatment with intramuscular injections of oestradiol benzoate in oil. The results have been beyond all expectation, and I now use this method as a routine. Many patients felt distinct improvement within twelve hours of the injections.

The cases varied from slight periarticular thickenings of the hands to marked multiple thickened joints. In one there was complete ankylosis of the knee-joints, but the general health greatly improved. Two patients had multiple thickened joints, pathological deformity of hands, knees, and feet, and very poor mobility. They were becoming totally disabled and were very depressed, and considered their cases to be hopeless. After several weeks' treatment all the mild cases cleared up completely. The two advanced ones made a remarkable recovery. One is almost free from any signs, and the other patient is fit for light occupation.

Oestradiol benzoate has been of great benefit in combination with spa treatment owing to the fact that patients suffering from depression often state that they have a feeling of general well-being during the first day of its use. Injections were given twice weekly intramuscularly in addition to the spa treatment. A high dosage of 50,000 units was used in severe cases, and 10,000 units and upwards for milder ones. Ampoules representing both strengths or a bulk quantity can be used, and a 1-inch-long No. 21 needle was found suitable. Injections were made into the deltoid and were quite painless. The syringe can be kept free from any moisture in a pocket spirit case containing 5% lysol added to the spirit. It is very important to warn these patients, irrespective of age, not to be alarmed if a menstrual cycle begins some days or weeks after the injection. The flow, if troublesome, can be regulated by giving calcium and ergot preparations, but this was not required, or if the cycle date is noted a corpus luteum preparation could be given daily for a week before the next cycle. This preparation is costly and its use in rheumatoid arthritis may not be of any particular advantage.

Oestradiol benzoate is tolerated by all, and has no harmful effects even in pregnancy. Male cases of rheumatoid arthritis also respond to oestradiol benzoate injections, but I have used only a short course on a few cases in view of any disturbance to the prostate gland. Stilboestrol can be used as a substitute but in a few cases nausea was complained of even with a small dosage. A recent improvement has been made to stilboestrol which obviates any nausea.

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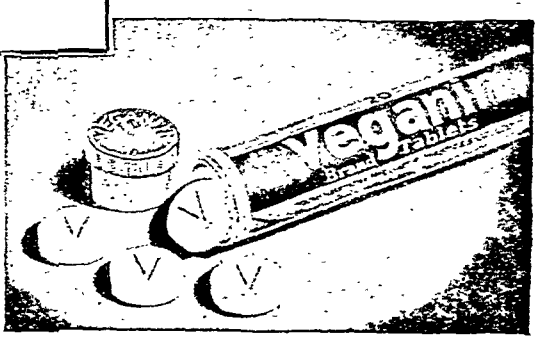
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Reviews

PRACTICAL SURGERY

A Short Practice of Surgery. By Hamilton Bailey, F.R.C.S., and R. J. McNeill Love, M.S., F.R.C.S. Fifth edition. (Pp. 1,015; 880 figures. 30s. net.) London: H. K. Lewis and Co., Ltd. 1941.

New editions appear despite war and paper shortage, and perhaps it is as well, since the authors of *A Short Practice of Surgery* tell us in their preface to this fifth edition that surgery progresses with such rapidity that they have found deletions and additions necessary in every chapter of the previous edition. The biographical footnotes continue to be an attractive feature of this book, but some are incompletely dated or need revising (e.g., J. Hogarth Pringle, p. 62; E. C. Davidson, p. 78; and Cushing, p. 600). Kocher's name appears with bones and joints, but should also appear in the chapter on the thyroid, and Sistrunk's should be attached to the operation shown on page 199. Carr is mentioned on page 769 and without the usual biographical reference, but the authors may not have seen a note on Carr's splint which appeared in the *Irish Journal of Medical Science* for April, 1940. The chapters on neurosurgery would benefit with still more revision: statements such as medulloblastomata being irremovable and catgut being used for dural closure and the bone flap taken out to decompress irremovable tumours would not meet with the agreement of most neurosurgeons. Elsewhere exception might also be taken to the dogmatic statement that the only effective treatment of Banti's disease is splenectomy. On the whole, however, revision has been good, and the book is sufficiently modernized to include a picture of a bomb fragment producing a comminuted fracture and of gas gangrene in a man wounded at Dunkirk. The new edition should ensure the continued popularity of this textbook.

EDUCATION OF EXCEPTIONAL CHILDREN

The Education of Exceptional Children: Its Challenge to Teachers, Parents, and Laymen. By Arch O. Heck, Professor of Education, College of Education, the Ohio State University. (Pp. 536; illustrated. 26s.) London: McGraw-Hill Publishing Company, Ltd.

One of the most difficult problems of education is to provide for those children who for one reason or another cannot or do not fit in with the majority of their fellows. Special education is expensive both in money and in personnel, and the present volume is an effort to evaluate what has been done in America and what ought to be done if exceptional children are to be provided for adequately and successfully.

In the first section what are called socially handicapped children are considered. These are the truants and delinquents, and in the course of the discussion a brief and rather inadequate survey of the causes of these behaviour reactions is given, but the main theme is how the State provides against these difficulties. First, what can be done by teachers and others in the ordinary school is dealt with, then special day schools are described and the advantages and difficulties of parental or, as we should call them, residential schools are discussed. These all cater for the child before he comes to the courts. The State training schools are then referred to, and the change of conception from a penal to an educational character of such institutions is noted. Several such schools are described.

The next section deals with the cripple child, and since the cripple has the same ambitions, desires, and mental abilities as has the average child he is entitled to equal educational opportunities, though his educational programme must recognize handicaps, while initiative and self-reliance should be specially encouraged and he must be kept at school just so long as school will help him intellectually, physically, and especially emotionally. Next the costs and difficulty of providing the necessary equipment for a cripple school are discussed and representative schools are described. Similarly, problems connected with the education of blind children, children with defective vision, deaf and partially deaf children and those with defective speech, or especially delicate children are discussed.

The third section approaches, along similar lines, the problems of the mental defective, which are well known to us in this country, but there is also a discussion of the proper provision for the optimum education of specially gifted children. This movement has aroused much prejudice and opposition in the United States and has scarcely been considered in this country at all, but it has some obvious advantages if the costs could be met and the sentimentalism which will help the defective but do nothing for the talented can be overcome. The last section takes up financial and administrative questions; it is naturally concerned with conditions in America and therefore less applicable to this country.

Although this is primarily an educational book of reference, it ought to be of interest to the medical profession, since proper education of children who are medically unfit is one of the prime essentials in their care.

THE CARDIOGRAM IN CONGENITAL HEART DISEASE

The Electrocardiogram in Congenital Cardiac Disease. A Study of 109 Cases, 106 with Autopsy. By Maurice A. Schnitker, B.Sc., M.D. (Pp. 147. 16s. 6d., or $3.00.) Massachusetts: Harvard University Press; London: Oxford University Press. 1940.

In his book on the cardiogram in congenital heart disease, which is stated by the publishers to be the first of its kind, Dr. Maurice Schnitker has attempted something which presents great difficulties. In the first place, the lesions are often multiple or complicated by acquired disease; and, secondly, post-mortem examination is essential to establish the exact nature of the defects. It is almost impossible for a single observer to see a sufficient number of cases and follow them to necropsy, and Dr. Schnitker's series of 109 cases (106 with necropsy) are largely collected from the literature, which, however unavoidable, does detract from their value. The cases are classified as acyanotic, late cyanotic, and permanently cyanotic, and a general description of each lesion is followed by fairly detailed clinical and post-mortem reports and illustrations of the corresponding cardiograms. This compilation will have its uses, but it also emphasizes the obscurity and complexity of its subject.

ACTIONS AND USES OF DRUGS

Synopsis of Materia Medica, Toxicology, and Pharmacology. For Students and Practitioners of Medicine. By Forrest Ramon Davison, B.A., M.Sc., Ph.D., M.B., Assistant Professor of Pharmacology, School of Medicine, University of Arkansas, Little Rock. (Pp. 634. 25s.) London: Henry Kimpton. 1940.

Prof. F. R. Davison has modestly entitled his work *Synopsis of Materia Medica, Toxicology, and Pharmacology*: it is true that the volume is of relatively small size, but since it contains well over 600 pages of small print it is, in fact, a very comprehensive textbook. It has been written from the clinical aspect and is concerned with the properties of those drugs that are of

practical importance. These are classified according to the character of their actions; the pharmacological effects, therapeutic uses, and toxicology are described in each case, together with any pharmaceutical properties that are of therapeutic interest. Thus the book covers a very wide range, for in addition to the pharmacology of medicinal drugs it gives a description of the toxicology of the more important poisons, such as lead, arsenic, and phosphorus. The wide range covered causes the description of pharmacological actions to be somewhat brief, and some of the statements made are open to question. On the other hand, Prof. Davison gives information about a remarkably large number of subjects and pays particular attention to recent advances in therapy. For example, accounts are given of the therapeutic uses of snake venom, heparin, and sobisminol.

The close printing of the volume makes it difficult to read continuously, but it constitutes an excellent work of reference, and its value in this respect is increased by the provision of selected references to recent literature.

Notes on Books

A Review of the Psychoneuroses at Stockbridge, by GAYLORD P. COON, M.S., M.D., and ALICE F. RAYMOND, A.B., is published in Massachusetts by the Austen Riggs Foundation. Stockbridge is a residential home for psychoneurotics which was run by Dr. Austen Fox Riggs, to whom this book is in some respects a tribute. The method of treatment is described as re-education and persuasion, and of later years some superficial analysis has been employed. After their first treatment the patients go home on trial visits, return for follow-up visits, and contact is retained by correspondence. In the twenty-five years of its existence some 5,300 cases were noted, but a sample of 1,060 cases only were chosen for this study. These were chiefly anxiety cases, and of these the history of ninety-two is summarized. Statistical data of all sorts of factors in the rest is given, and although the method of treatment is accorded considerable approbation the results are not particularly striking, 30% being considered to be much improved, 28% improved, 6% unimproved, and 36% unknown. Among various appendices one gives a sort of survey of psychology which is handed in pamphlet form to the patient for his study at leisure. While this book contains a collection of odd statistical records, some of which may be useful for reference, it cannot be regarded as very interesting or very instructive to the ordinary reader.

Textbooks on histology and embryology are largely written for the use of medical students, but there is another class of readers who require a practical knowledge of these subjects—namely, science students who are preparing to teach elementary biology in schools. The small book on *Practical Histology and Embryology*, by NELLIE B. EALES, D.Sc. (Macmillan, 3s. 6d.), is admirably adapted for this type of student. Its general trend is well indicated in the opening sentence of the author's preface: "There is always satisfaction to be derived from a well-stained section or slide mount, and to make it for oneself gives even greater pleasure." The book shows the way to prepare such specimens, and briefly describes the elementary principles concerned in interpreting the appearances which are seen when the sections have been mounted and are viewed under a microscope. In the section on embryology there are a few outline drawings which accurately represent certain stages in the development of fish, frog, chick, and rabbit embryos. One would like to see more of these, and also some notes on the use of projection apparatus, with a view to encouraging the practice of making accurate records of work accomplished in the laboratory. The book represents the work of an experienced and devoted teacher, and merits a wide circulation.

No. 18 of the *Proceedings of the University of Otago Medical School* has been published at Dunedin under the editorship of Prof. J. B. Dawson. It consists of reprints of papers which have appeared in the *New Zealand Medical Journal*, the *British Medical Journal*, and other journals during 1939-40; also Prof. D. W. Carmalt Jones's address at the graduation ceremony in May, 1939. The volume may be consulted in the Library of the British Medical Association.

The University of California has published its *Hospital Formulary and Compendium of Useful Information* in a form convenient for the pocket. Doubtless it will often be found there, for the amount of helpful information compressed into this slender volume is indeed remarkable. Out of its 255 pages only 16 are devoted to the hospital prescriptions, the remainder ranging over such diverse fields as vaccines, diet tables, infant welfare, laboratory procedures, and common emergencies. Truly a *multum in parvo*. It is published at $2.00 by the University of California Press, Berkeley and Los Angeles.

Preparations and Appliances

X-RAY STRETCHER OUTFIT

An *x*-ray stretcher outfit has been introduced by Philips Lamps Ltd. (Century House, Shaftesbury Avenue, W.C.2) with the object of reducing the amount of handling to which acute cases are subjected in the journey to and from the *x*-ray room. With this stretcher the patient undergoes one move only—carried out at the bedside by the nursing staff. The outfit consists (1) of a special form of wheel stretcher suitable for use as an *x*-ray table, and (2) of a pedestal Bucky unit to which the stretcher can be coupled so that the two together form a horizontal radiographic Bucky couch, and only the tube stand or mobile unit is needed to complete the installation. In the *x*-ray department the stretcher with the patient already in position is wheeled over the pedestal Bucky, which is raised into contact by pressure on a foot pedal, and the radiograph is then made. The apparatus can be adapted for other uses: with the completion of a head lamp the pedestal Bucky becomes a convenient radiographic apparatus for the skull, and with the addition of a back rest it can be made to serve as a pelvimetry outfit. Every detail of construction has been thought out to give the utmost facility and convenience, especially in a casualty department working under pressure.

ASCORBIC ACID FOR INFANTS

Infant "celin" tablets (Glaxo Laboratories Ltd.) contain 5 mg. ascorbic acid, a quantity which the vendors state to be equivalent to the content of two teaspoonfuls of orange juice. Messrs. Glaxo provide a pamphlet which explains the necessity for an adequate supply of ascorbic acid in infant feeding, and point out that deficiency of this vitamin is likely to be caused by the scarcity of oranges. The tablets are sold at 12s. per 1,000, or 2s. 3d. per gramme of ascorbic acid, a price which is less than the cost of an equivalent quantity of orange juice.

OXYLAN FOR OXYURIASIS

"Tabloid oxylan" (Burroughs Wellcome and Co.) has the chemical constitution *p*-benzylphenyl carbamate. It is recommended for the treatment of oxyuriasis (threadworm infestation) in children and adults. The makers state that it is designed to replace a preparation of foreign origin. The compound is stated to be efficacious and to be free from undesirable side-effects. The adult dose is 7½ to 15 grains (1/2 to 1 gramme).

SYNTHETIC LEMON POWDER

Crookes's lemon powder (synthetic) is a powder which provides a synthetic lemonade. One teaspoonful in a fluid ounce of water provides a drink which contains 10 units (0.5 mg.) of ascorbic acid and 80 mg. of citric acid per mille. This is similar to the content of these substances in undiluted lemon juice. The makers point out that the absence of lemons from the English market has created a need for a lemon powder which is an adequate substitute for lemons in regard to its content of ascorbic acid.

British Medical Association

CLINICAL AND SCIENTIFIC PROCEEDINGS

Oxford Division

Two general meetings of the Oxford Division have been held at the Radcliffe Infirmary, Oxford, during recent months. Non-members and clinical students attended, and Dr. W. STOBIE presided on both occasions.

PRINCIPLES OF RESUSCITATION

At the first meeting Prof. L. J. WITTS opened a discussion on the principles of resuscitation. He first said that he agreed with Mr. Rock Carling that resuscitation was primarily a physician's task. Referring to the Oxford area, he said that in the event of an air attack 500 casualties might reasonably be expected, and the Radcliffe Infirmary might have to cope with 250 casualties in twenty-four hours. Eighty beds could be made available in about twenty minutes, with more within twenty-four hours. The Infirmary could deal with 100 severe casualties in about twenty-four hours, given that the four available surgical teams might each require one hour's operating time per casualty. There need be no desperate hurry to get most of these patients to the theatre. They must first be made warm and rendered fit for surgery: but there must, of course, be no undue delay. The resuscitation and pre-operative measures should be regarded as one entity. Case notes on each patient were desirable, and students were being trained to take notes so far as possible as usual. Traumatic shock was due to loss of fluid from the circulating blood. This could be caused by (1) exudation of plasma into tissues—for example, in patients suffering from burns or crushed under masonry; (2) loss of blood; and (3) a combination of both.

Treatment must be directed to the following. *(a) Fluid Replacement.*—At least forty-eight bottles (two-pint) of blood or plasma per 100 casualties would be required. Plasma kept better than blood and required no grouping, but it was more expensive, because three bottles of blood were required to produce one bottle of plasma. Fluid by the mouth could be given as hot tea, milk, or beer. *(b) Warmth.*—This could be given by the electric cradle, hot-water bottles, etc., but its exact application had not yet been fully worked out. *(c) Relief of Pain.*—In casualties requiring operations this concerned the anaesthetist. Points of importance were the time of the operation, and the fact that casualties with head injuries should not usually be given morphine. *(d) Oxygen.*—The patient should get the highest possible concentration. The tissue anoxia was due to the feeble circulation in shock; therefore as much oxygen as possible should be dissolved in the plasma itself in addition to that in the corpuscles.

PREMEDICATION FOR ANAESTHESIA

Prof. R. R. MACINTOSH, discussing relief of pain and premedication from the anaesthetist's point of view, said that patients did not all start from the same metabolic level when being anaesthetized. Youth, pain, fear, fever, and a quality of resistance known to the Americans as "sthenicity" all tended to raise patients above the hypothetical starting-point of anaesthesia. The aim of sedative premedication should be to lower each patient as nearly as possible to this common hypothetical starting-point. Drugs used for this purpose acted mainly by lowering the basal metabolic rate. They should be given if possible one and a half hours before the anaesthetic. Atropine or hyoscine was also given to inhibit bronchial secretions stimulated by anaesthetics such as ether; atropine began to act in about ten minutes from injection subcutaneously. He suggested that a label should be fixed to each casualty while in the ward stating the name, the pre-operative drugs given, and the time they were given. Post-operative drugs could be ordered on the back of the label—for example, "1/6 grain morphine if in pain or restless." The "tonsil" recovery position was the best post-operatively. The patient should not be left on his back owing to the risk of respiratory obstruction by the tongue.

Dr. FLETCHER demonstrated the bottle used by the Oxford Blood Transfusion Service for the recipient; this was supplied with sterile needle ready for use. If venepuncture was difficult, he said, it was better to cut down on the vein at once. Difficulty in getting the blood to flow in shocked patients might be due to spasm. A Higginson syringe or a sphygmomanometer bulb and cuff attached to the air inlet of the bottle could be used to raise the pressure and counteract the spasm.

Dr. MOLE demonstrated apparatus for oxygen therapy. He said that some type of flowmeter was necessary. A Boyle's type bubble bottle gave this in its simplest form and was fairly satisfactory. Methods of administration were: (1) The simple funnel and tube; this was practically useless. (2) An anaesthetic face-mask, which could be used for short periods but was distressing to the patient. (3) Nasal catheters, which were fairly satisfactory; extra holes in the catheter increased its effectiveness. The catheter must be lubricated and passed far enough into the nasal cavity along its floor. The correct length to insert was the distance between the nostril and the lobe of the ear; this was about three or four inches. A catheter in both nostrils was more effective than one. The spectacle frame was a useful carrier for two catheters. Three litres per minute could be delivered comfortably by one nasal catheter; this would raise the alveolar oxygen to 30%. Five litres per minute could be administered with two catheters, thereby raising the alveolar oxygen to 45% or 50%. (4) The B.L.B. mask, which was the most efficient and comfortable method. A nasal or an oro-nasal type could be used. With this mask the alveolar oxygen could be raised to 90% by using a flow of six to eight litres per minute with the air-holes closed. This mask could also be used to relieve surgical emphysema or intestinal distension by replacing the relatively non-absorbable nitrogen by oxygen.

A discussion followed in which Mr. G. R. GIRDLESTONE stressed the importance of speed in getting casualties to the theatre in less than six hours. He also suggested experiments to see whether organisms in wounds could be kept quiescent by means of ice applied locally while the patient was treated by warmth and restoratives.

RECENT DEVELOPMENTS IN IMMUNIZATION

Prof. G. S. WILSON, in a talk on modern developments in immunization methods, said that in considering any prophylactic inoculation the following principles must be remembered. (1) It was not worth while vaccinating patients against a disease unless that disease was serious enough to warrant it. (2) The disease must be common enough to make it worth while. (3) The vaccine must be of proved potency. (4) Reaction to the vaccine should be relatively mild in comparison with the disease itself. If these criteria were accepted, chicken-pox and rubella could be ruled out at once. Influenza could also be ruled out because the vaccine was still experimental; the disease—probably due to a virus—was not a bacteriological entity. Scarlet fever immunization was unsatisfactory, the reactions being often as severe as the disease. This left, in peacetime, diphtheria, measles, whooping-cough, and small-pox, to which in wartime could be added enteric fever and tetanus.

Diphtheria.—The protection given by immunization was very good. The disease was uncommon before the first year of life, and the maximum mortality occurred between 5 and 10 years. It would be possible to eliminate the disease if all the children from 1 to 15 were immunized; it could be regarded as satisfactory if 90% or more of this age group were inoculated. The immunity produced was antitoxic, not bactericidal; therefore it was important to immunize all children, as the immunized might become healthy carriers and prove a source of danger to the non-immunized. A.P.T. was the most satisfactory agent, but he did not recommend the one-shot method. Two injections acting as primary and secondary stimuli were necessary. The second injection should never be given under four weeks. Prof. Wilson advised 0.1 c.cm. for the first and 0.3 c.cm. for the second injection. This would make 98% to 100% of children Schick-negative. Reactions were rarely severe under 15 years, though there might be local redness, swelling, and tenderness. This method was

not advised for adults, as severe reactions might occur. If all pre-school and school children were immunized the adults need not be worried about. Prof. Wilson suggested as a complete course that the first two injections should be given before school age, followed by 0.3 c.cm. on going to school, and 0.3 c.cm. about the age of 10. A sudden outbreak of diphtheria at a school could be controlled by giving each child 500 units of special refined antitoxic serum (0.1 c.cm.) in one arm, and 0.1 c.cm. of A.P.T. in the other at once. All should have throat swabs taken and all carriers found should be isolated. The school could return the following day. Four weeks later all should be given their second dose of A.P.T. (0.3 c.cm.), and after a further two weeks the carriers could be allowed to return.

Measles.—The mortality was maximal in the second year, and 85% of deaths occurred in the first five years. Two methods of prophylaxis were available: (*a*) convalescent serum and (*b*) pooled adult serum; the former was about twice as potent as the latter. For complete protection the serum should be given within three days of infection; for partial protection, which was usually preferable as it gave permanent immunity, the serum was delayed to between the third and fifth days, or else half a dose of serum was given.

Whooping-cough.—The maximum mortality was in the first year. Large doses of vaccine were required for immunization, starting at about 10,000 million, three or four doses being given at weekly intervals from the end of the second or third month of life. The duration of protection was unknown. This injection could be combined with diphtheria immunization.

Enteric Fever.—This was not normally common, but wartime increased the risk of infection. Vaccines gave substantial, but not complete, immunity. Reactions might be severe in the first three days following injection. A new vaccine containing alcohol instead of phenol was being produced which was more potent and after which there was less reaction. In starting general immunization Prof. Wilson advised concentrating on those persons most likely to become infected—for example, doctors, nurses, A.R.P. workers, etc. The Ministry of Health had advised against general immunization at present unless an epidemic appeared. Prof. Wilson felt that the risk of an epidemic occurring in Oxford was probably not very great, but that it might be worth while to immunize the population gradually.

Tetanus.—The risk of infection was very slight in peacetime, but was great in wartime. A toxoid similar to that for diphtheria was now available (formol-precipitated), two doses of 1 c.cm. being given with six weeks' interval. This produced a considerable degree of immunity, but as anti-tetanus serum was given to every casualty as a routine it was at present doubtful if it was worth immunizing people as well.

NUTRITION

At the second meeting Dr. H. M. SINCLAIR opened a discussion on nutrition. After a brief review of research work on vitamin deficiency and some reference to the value of protein, fat, and carbohydrate in proper proportion in the diet, and also of minerals, especially calcium and iron, he said that there was much public ignorance about the importance of a properly balanced diet. The idea that orange juice supplied all that was necessary in the way of vitamins was common. He then discussed the importance of the fat-soluble vitamins A, D, E, and K, and of the water-soluble vitamins C, P, and the B complex. War conditions increased the likelihood of deficiency arising from the severe restrictions on fats and raw fruit. The simplest and cheapest way of avoiding such deficiency was to take one of the various vitamin concentrates on the market. Deficiency of one vitamin alone practically never occurred. In reply to a question as to how much harm could be done by the ingestion of excess of vitamins, Dr. Sinclair said that only two of them—vitamin D and nicotinic acid—were toxic if taken in excess. But very large amounts were needed to produce symptoms of poisoning. A few years ago some deaths were reported from calcification of the breast and blood vessels in children who had been given halibut-liver oil in doses suitable for cod-liver oil. It had not been realized at the time that halibut-liver oil contained much more vitamin D than cod-liver oil.

Nova et Vetera

SOME TEXTBOOKS OF FIFTY YEARS AGO

Dr. JOHN R. KEITH writes from Southsea:

I was greatly delighted by the Nova et Vetera article bearing the above title (March 15, p. 413). It recalled to memory many pleasant hours spent in reading several of these books and others suggested by them. For example, what a charming writer was John Milner Fothergill, who combines poetry and anecdote with invaluable clinical information. His *Physiological Factor in Diagnosis* is of the highest value; so, too, is *The Antagonism of Therapeutic Agents, and What it Teaches.* Also his brochure, "What to Ask," is what every young general practitioner ought to read if it is still in print. Many years ago I wrote an article on the value of perusing medical literature, and among the books I mentioned was King Chambers's *Clinical Lectures.* I sent a reprint to Sir William Osler, who acknowledged it by an appreciative postcard, in which he said that King Chambers's *Renewal of Life* was a favourite book of one of his teachers in Toronto. Among other writers of medical books of bygone days which may be read with much profit are Furneaux Jordan, the author of *Surgical Enquiries* and his Hastings Essay on Shock; and Thomas Inman, whose monograph *On Myalgia* is one of the most helpful medical books I have ever read. With regard to Inman, Cameron Gillies in his *Counter-Irritation* writes: "If first-class men produce first-class work only to lie buried in dusty heaps of tomes in out-of-the-way corners of our libraries and museums, it is not surprising that medical progress is so slow and uncertain." Highly useful to the general practitioner are Peter Hood's *On Bone-setting* and Wharton Hood's *Treatment of Injuries by Friction and Movement.* A medical man well known to me was once condemned to an inactive life for several weeks through ignorance of the existence of this book. He had ruptured several fibres of one of the gastrocnemii. Had he known of this volume he would have been able to continue active medical practice without difficulty. Another useful book concerning injuries is Anglin Whitelock's *Sprains and Allied Injuries of Joints,* which contains what I have found to be the best method of reducing dislocated semilunar cartilages. I must not omit mention of Ramsay Smith's *Angio-Neurosis,* which deserves a better fate than being allowed to lie in a first edition. I cannot conclude without a reference to G. H. Sutton's *Lectures on Pathology,* upon which Morley Roberts bestows a high eulogium.

In his interesting Cameron Prize Lecture, delivered last October (*Edinb. med. J.*, 1941, **48**, 1), Prof. E. C. Dodds remarks that few commentators realize that the introduction of aspirin in 1899 marked the start of a new era in medicine. The preparation by von Baeyer of a pure preparation of acetyl-salicylic acid showed that the chemist could synthesize new compounds that proved to be more effective than those occurring naturally. The Germans, Prof. Dodds remarks, were quick to understand the significance of this discovery, and the production of synthetic compounds with specific therapeutic activities was carried out by many scientists. "The years that followed were crowded with successful work in this field, carried out almost entirely by chemists working for the big German chemical firms." Before describing his own work on stilboestrol Prof. Dodds touches briefly on some of the earlier attempts at opotherapy. During the sixteenth and seventeenth centuries physicians were in the habit of prescribing Egyptian mummies as opotherapeutic agents. The treatment became so popular that "the supply of the genuine article ran out, and a new industry to manufacture Egyptian mummies sprang up." The industry was centred in France, where the bodies of executed criminals and slaves were used for the synthetic mummies.

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VACCINE FOR TYPHUS

Following the last world war and its aftermath, which brought malnutrition and poor living conditions in vast areas, influenza swept round the world and exanthematic typhus assumed epidemic proportions in several countries. Recently there have been reports of typhus fever among the Italian troops in Albania, and small epidemics among the civilians in Poland. Now the effects of the civil war in Spain are bearing the same fruit. So far some 300 cases of exanthematic typhus with 27 deaths are said to have occurred in Madrid, and there have been cases also in Seville, Granada, and Almeria. There is a scarcity of washing soap as well as of food, and the Madrid authorities are taking vigorous action in dealing with such possible carriers of lice as *mendicants and loiterers*. This epidemic has provided an opportunity for a thorough trial in the field of the latest and most promising vaccine yet evolved against the typhus infections. Hitherto, either living attenuated or inactivated typhus rickettsias have been used as a vaccine. The French have employed a vaccine of living murine rickettsias in Morocco and Tunis on a large scale. This may be dangerous in areas where an epidemic is present, or where there is overcrowding, for lice may become infected by feeding on vaccinated individuals while they still have living rickettsias in the circulation. There is also no definite proof that the murine virus vaccine completely protects against the exanthematic strain. When killed rickettsias are used very many must be injected for the vaccine to be effective. Weigl's vaccine,[1] which was widely employed, consisted of a formalinized suspension of guts of lice infected with rickettsias by inoculation per rectum. This entailed the keeping of an enormous louse population and was a laborious procedure. The recently evolved vaccine of Durand and Giroud,[2] which is much simpler to prepare, consists of an almost pure suspension of formalinized exanthematic typhus rickettsias obtained from the lungs of mice inoculated intranasally. Unfortunately four or five inoculations at weekly intervals are necessary.

In an attempt to produce large numbers of rickettsias Zinsser and his colleagues[3] have used chick embryo tissues mixed with the rickettsias and spread on agar slopes. This yields a large number of rickettsias, but is not as simple as Cox's method[4] of injecting the rickettsias directly into the egg yolk sac, which gives an even better yield. Fertile eggs, which have been incubated six or seven days at 39° C., are inoculated into the yolk sac and incubated at 37° C. until the death of the embryo, which usually occurs in five to seven days. The yolk sac is then removed with sterile precautions, ground in a mortar, and suspended in saline, and a nearly pure suspension of rickettsias is obtained by differential centrifugation. Phenol and formalin are added and the vaccine is stored at 2° C. Smears are made from the yolk sac when it is removed to verify the presence of the rickettsias. After trying various methods Gear[5] in Johannesburg found this to be the simplest, one person being able to turn out large quantities in a short time. If desirable, murine and exanthematic rickettsias can be grown separately and mixed in the final vaccine. This vaccine prepared by Cox, as well as fresh vaccine made locally, is being used in Madrid. Three inoculations are given at weekly intervals with little ensuing reaction. A similar vaccine has already been tried out in Peking, but results are not yet available. In view of the suggestion of Pijper and Crocker[6] that the South African epidemic typhus may not be identical with the classical European strain, it will be interesting to hear if there is any difference between the results with the American vaccine and that prepared locally, presumably from a strain recently isolated in Spain. Although British troops in Russia and Serbia in the last war fought side by side with the local soldiers, among whom typhus was very prevalent, few of them contracted the disease, due largely to the vigorous delousing methods carried out. Nevertheless it is comforting to know that, if necessary, there are possibilities of readily producing an efficacious vaccine in large quantities.

It is a far cry from Spain to New Guinea, where a form of endemic typhus exists, though none has been reported yet from either Papua or Dutch New Guinea, which adjoin it. Gunther,[7] in reviewing the disease there, describes the cases as clinically resembling those of Japanese river fever and having agglutinins for *Proteus OX K* in their serum. It is practically confined to the adult white males, and among the diseases attacking whites in New Guinea ranks second only to blackwater fever in importance. Since 1934 there have been seventy-four cases with nine deaths in the Molobe district. The likely vector is a larval trombidiid mite, *Trombicula minor* Berlese 1905, and a bandicoot, *Echymipera cockerelli* Ramsey 1877, is probably the reservoir of the disease. Lewthwaite and Savoor[8] have shown that the scrub typhus of Malaya and the mite fever of Sumatra are identical with Tsutsugamushi disease of Japan, and the disease in New Guinea apparently belongs to this group. Though the Japanese have used so-called attenuated or less virulent strains for immunizing, there is no killed vaccine available against these diseases, in which the mortality rates vary widely, with 4.5% in the Malayan fever, 40% of Europeans and 5% of Japanese in the Sumatran fever, and 40% for the Japanese river fever. It is to be hoped that the embryo chick and its membranes may soon be found to be a satisfactory culture for the mite-borne rickettsias, as it has for the louse-, flea-, and tick-borne varieties.

In the Far East a further step has been made in solving the rare group of undiagnosed fevers in Australia. In 1935 Langan and Matthew,[9] and Unwin,[10] reported that serum of some patients with

[1] *Bull. int. Acad. Cracovie, Classe de Med.*, 1930, 4, 25.
[2] *Arch. Inst. Pasteur, Tunis*, 1940, 29, 25.
[3] *J. exp. Med.*, 1939, 63, 179.
[4] *Publ. Hlth. Rep.*, U.S.A., 1938, 53, 2241; 1940, 55, 110.
[5] *S. Afr. med. J.*, 1940, 14, 476.
[6] *Ibid.*, 1938, 12, 613.
[7] *Med. J. Austral.*, 1940, 2, 564.
[8] *Lancet*, 1940, 1, 255, 305; *Brit. J. exp. Path.*, 1940, 21, 117.
[9] *Med. J. Austral.*, 1935, 2, 145.
[10] *Ibid.*, 1935, 2, 303.

"coastal fever" of North Queensland agglutinated *Proteus XK*. Now Heaslip[11] has isolated from numerous cases of coastal fever a pleomorphic organism, usually seen as a Gram-negative bacillus showing bipolar staining or as a Gram-positive anthrax-like bacillus. It grows readily on, or in, artificial media at temperatures between 20° C. and 30° C., but will not multiply appreciably at 37° C., when the media are directly inoculated with the patient's blood. Transmission appears to be by a vector which is either a mite, which seems the most likely, a mosquito, or a tick. It is possible that droplet infection could occur, for the organisms are present in the sputum if the patient develops the specific bronchitis which may be a symptom of the disease. The organism has also been found in the blood in cases of typhus. It is present in 70% of captured rats and bandicoots in the district. The disease occurs all through the year, but the heaviest incidence follows immediately after the rainy season. At this time there is a seasonal increase in the number of mosquitos and larval mites, and as a result of flooding of fields the rats are driven closer to human habitation. Heaslip believes this probably is the same organism as that which Anigstein found in cases of typhus in Malaya in 1933.

TOXICITY OF STILBOESTROL

English clinical experience has not for the most part found that the toxic side-effects sometimes associated with the administration of stilboestrol are of such a magnitude or severity as to contraindicate the use of the drug. In America, however, there has been more hesitancy about the acceptance of the synthetic product in place of the natural hormones in spite of the advantages offered by the oral potency and relative cheapness of the former. The reports submitted to the Council on Pharmacy and Chemistry of the American Medical Association were not unanimous enough on the question of toxicity to allow the Council to recommend the recognition of stilboestrol or its inclusion in *New and Non-official Remedies* until further experimental trials had been undertaken. The report which emphasized the toxicity more particularly was that of Shorr, Robinson, and Papanicolaou,[12] who found that only 20% of their forty-four patients exhibited no toxic symptoms. The rest suffered from some or other ill effect, gastro-intestinal disturbances such as nausea and vomiting being the most common. Other symptoms noted were lassitude, cutaneous rashes, acute thirst, and a psychotic reaction in one case. The evidence of toxicity in the other two reports on which the Council decision was reached was by no means so striking. Buxton and Engle[13] had laboratory evidence of toxicity (albuminuria) in only one of their sixteen cases, and the nausea and vomiting they occasionally found were not thought by them to be a contraindication to the use of stilboestrol. MacBryde, Freedman, and Loeffel[14] studied thirty-seven patients and reported vomiting in only three, although doses as high as 5 mg. a day were given.

Subsequently American clinicians have not in the main supported the view that the occasional toxic effects of the synthetic oestrogen are pronounced enough to preclude its use in human therapy. Karnaky[15] has treated in all 189 cases and found nausea in only a few, and suggested that this was eradicated if the tablets were taken after meals. Some patients in this series had doses of 90 to 234 mg. given during three days without any ill results. Since the nausea and vomiting occur as readily after parenteral as after oral administration, there is reason to suppose that the origin of the symptoms is to be found centrally rather than in local irritation. As certain animal experiments had suggested that stilboestrol caused liver damage, Shorr and his colleagues[1] performed liver-function tests on their patients, with, however, inconclusive results. Freed, Rosenbaum, and Soskin,[16] in a recent study of this question, were unable to obtain any evidence for such a toxic action on the liver. They carried out bromsulphalein retention tests on eight menopausal patients before and during stilboestrol therapy, and on the treated women compared with normal women of the same age group. They finally gave 5 mg. stilboestrol daily for three weeks to a man recovering from an acute attack of hepatitis without the slightest evidence that his convalescence had been impeded. Von Haam, Hammel, Rardin, and Schoene[17] have also reported the results of their administration of stilboestrol to 125 patients. They find that, although 42% of their patients developed some untoward symptoms, these could be controlled in all but nine cases by suitable reduction of the dose. These authors carried out very extensive laboratory investigations, but were unable to detect any disturbance of function. Alcohol test meals were performed on some of their patients, and a slight reduction in acid secretion was noted after nauseating doses of stilboestrol.

It is generally agreed that there is considerable individual variation in the tolerance to stilboestrol, some patients feeling nausea with doses as low as 0.5 mg. a day, while others will take 5 or 10 mg. a day without showing any disturbance. In some of the clinical reports there is insufficient indication of the dosage given to the patients, so that one cannot tell whether there has been any attempt to arrive at the minimal effective dose for the individual patients rather than to give some constant dose to each patient purely empirically. Such a report as that of Kurzrok and others,[18] who observed persistent nausea and occasional vomiting in more than one-half of their forty patients, is open to this objection. The experience in France has been somewhat similar to that in the United States in that the first clinical report, that of Varangot,[19] laid heavy stress on the toxic manifestations, while the later reports, such as that of Huet, Comte, and Herschberg,[20] have in general accepted the new substance as a useful therapeutic agent whose toxic effects are slight and can usually be regulated by suitable adjustment of dosage. Huet and his colleagues found that only 10% of forty-six patients developed nausea, and the vomiting which occurred in 3% of cases cleared up rapidly on cessation of treatment.

There seems on the basis of the available evidence little objection to the use of stilboestrol in place of the

[11] *Med. J. Austral.*, 1940, 2, 555.
[12] *J. Amer. med. Ass.*, 1939, 113, 2312.
[13] Ibid., 2318.
[14] Ibid., 2320.
[15] *Stl. med. J.*, 1939, 32, 813.
[16] *J. Amer. med. Ass.*, 1940, 115, 2264.
[17] Ibid., 2266.
[18] *Endocrinology*, 1940, 26, 581.
[19] *Presse méd.*, 1939, 47, 725.
[20] *Gynécologie*, 1939, 38, 517.

natural hormones provided that it is used intelligently. There is no point in giving larger doses than are strictly necessary, and each individual case must be studied to find out what is the minimal dose which will yield the desired result. Most clinical observers seem to be agreed that doses of more than 1 mg. a day are very rarely necessary, and that much lower doses are quite effective in a great many cases. The question of the toxicity of stilboestrol may, however, become a purely academic one if the preliminary data on the newer oestrogenic analogue hexoestrol given by Bishop and his colleagues[21] in the form of a report to the Therapeutic Trials Committee of the Medical Research Council are confirmed. Their findings indicate that the new compound, while not so active weight for weight as stilboestrol, gives rise to nausea and vomiting in a much lower proportion of cases. Its oestrogenic activity is in all respects similar to that of the natural hormones. It is hoped that the controversy on the toxicity of the new compound will be slight; so far no clinical reports have appeared except the one referred to above.

GAUGING CHILDREN'S PHYSICAL FITNESS

All workers in the field of child health are faced with the problem of finding an efficient, economical, and simple method of gauging physical fitness. The Children's Bureau of the United States Department of Labour has recently issued a valuable study on this subject,[22] in which Dr. Rachel M. Jenss and Dr. Susan P. Souther give details of a most interesting piece of work. Put briefly, the method adopted was the observation of over 700 white school children attending the public elementary schools in New Haven, Connecticut, from September, 1934, to May, 1936. These were 365 boys and 348 girls, who were first examined when they were 6 years of age. This examination included a physical examination by a well-trained paediatrician, anthropometric measurements taken by one anthropometrist, and certain social-economic data made at home visits by trained workers. A second examination was made a year later by the same paediatrician and anthropometrist, and in addition the boys and girls were weighed at intervals during the study. When the children reached 7 years of age a comparison was made between what may be termed clinical criteria and four selected indices of body-build, the object being to test the value of such indices in picking out children likely to be physically unfit. The clinical criteria were: clinical judgment of general nutritional status, need of medical and dental care, and an estimate of the child's gain in weight and change in arm-girth over the period of observation. The four indices chosen were: the "Baldwin-Wood index," the "arm-chest-hip index" (developed by the American Child Health Association in 1934), the "nutritional status indices" (based upon a fairly complicated score card), and the "Pryor width-weight tables." Each index requires certain special measurements and in most instances it calls for fairly complicated calculations.

[21] *Lancet*, 1940, 1, 529.

[22] *Methods of Appraising the Physical Fitness of Children*. By Rachel M. Jenss, Sc.D., and Susan P. Souther, M.D. Bureau Publication No. 263. United States Department of Labour. Government Printing Office, Washington. 15 cents.

This study indicates quite clearly that none of these indices is an efficient method of identifying children who, according to the clinical (and continuous) observations, are likely to be physically unfit. The indices proved neither sensitive nor selective, failing to pick out certain boys and girls clearly indicated by one of the clinical criteria to be in need of medical care or nutritional advice and assistance, and, on the other hand, sometimes picking out children passed as physically fit. But even with such clear failure of the indices the clinical aspect of assessment also comes in for criticism. The clinical judgment of the paediatrician who made the examinations was prone to considerable error, in terms both of the variability and of the stability of the judgment. It is certain that some measure of a child's growth, such as periodic weighing, and also some accurate knowledge of the child's dietary habits, are necessary adjuncts to the physical examination. It is to be hoped that this detailed and well-documented American study will clear the air and stop once and for all the wasted energy spent on pursuing any sort of magical index of nutrition. The assessment of physical fitness is probably much more closely related to *function* than to *structure* and not likely to be expressed in numerical form. Although the assessment of the state of nutrition by clinical examination is beset with many difficulties, as has been pointed out on more than one occasion by the leading public health authorities in this country, the American study under review suggests that it offers a better basis than pure anthropometry. Close co-operation between the clinician, the social worker, and the public health expert should make it possible to achieve some satisfactory standards of nutrition.

WAR FINANCE

There is a clearer idea now than was apparent during the last war that a Chancellor of the Exchequer should keep two main purposes in view when framing his proposals: first, that taxes must be collected to meet so far as may be reasonably possible the payments which the Government will have to make: and, second, that an important part is played by the same operation in restricting the purchasing power of the taxpayer and to that extent setting free goods and services for national use. If the private demands of the individual and the public requirements of the Government enter into vigorous competition, prices are forced upwards and we are on the road to that state of inflation which brings hardship to the individual and danger to the State. Sir Kingsley Wood has introduced a new principle into his Budget, which is deliberately aimed at restricting private consumption—namely, that the share of the taxpayer's income (that is, of his purchasing power) which the State can properly withdraw from his control can be increased if there is a reasonable prospect of some portion of it being returned to him in a few years' time. In operation its effect is that, to the extent to which the additional heavy burden of the income tax payable for 1941–2 arises from a reduction in the allowances, "personal," or in respect of "earned income," rather than from an increase in the rate of tax payable, the taxpayer will receive a credit against which he can draw after the war. The reduction in these allowances is such that the maximum amount of "credit" for this year is £65. The extension of the surtax to the field of total incomes between £1,500 and £2,000, which was foreshadowed in last year's Budget, has

not been effected—presumably because taxpayers within that group have been sufficiently hard hit by the rise in the rates of the ordinary income tax. At the other end of the scale the reduction in the exemption limit and in the personal allowances will not only bring in a very large number (possibly two millions) of new taxpayers under contribution, but will also increase sharply the tax to be paid by those who hitherto have contributed only small amounts to the Exchequer. The Chancellor, and indeed the taxpayers concerned as well, are to be congratulated on the fact that last year a system of payment by deduction was successfully launched as regards persons in employment; probably without some such arrangements in force a large proportion of wage-earners, and many of the salaried classes, would now find it extremely difficult to discharge their half-yearly liabilities. The language of war finance speaks in terms of such vast sums that they seem to lose reality; it may suffice here to point out that, as compared with the estimates of the first Budget of last year, the anticipations for both expenditure and revenue were exceeded by about 15%, and that income-tax payers contributed the record sum of £524,000,000 to the total revenue. One sentence from the Chancellor's Budget speech may be quoted as bringing home the extraordinary demands which taxpayers now have to meet: "I may perhaps mention that excluding Excess Profits Tax and Excess Profits Duty, the increases in the taxation imposed since September 30, 1939, alone equal the total produce of all taxes in 1918, the last year of the last war." On the important question of possible inflation Sir Kingsley Wood was reassuring; what he referred to as "the inflationary gap" he regarded as reduced by his proposals and by the activities of the National Savings Movement and other causes to dimensions which, at any rate in the near future, could not be regarded as dangerous. Apart from what might be called the "compulsory savings element" in the income-tax proposals—and the absence of any increase in indirect taxation—the Budget contains nothing novel.

POST-OPERATIVE PERFUSION OF THE BILIARY SYSTEM

The various operative procedures carried out on the gall-bladder and extrahepatic biliary passages do not always give the perfect results that are desired. The factors leading to failure are by no means uniform, and they are by no means always clear. In some cases the failure may be due to the persistence of inflammatory or pre-calculous changes in the intrahepatic or extrahepatic duct system; in some it is due to calculi, debris, or biliary mud in some part of the system; while in others concomitant disease of the pancreas is the cause. But, in general, post-operative sequels are due to the absence of a normal duct system. In recent years various methods have been employed to ensure a better toilet of the biliary ducts, including duodenal drainage, ether lavage of the common duct, and the direct lavage of the biliary ducts post-operatively by means of a syringe attached to the drainage tube. All these procedures are of special value in cases where calculi can be shown by the cholangiogram. Dean Macdonald[1] has recently described a method of continuous perfusion of the biliary passages with the use of an intravenous apparatus. Fluid or antiseptic, which is heated, is introduced from the apparatus through a tube into either the gall-bladder or the common bile duct, percolates through the biliary system, and is returned through a duodenal tube. Relaxation of the sphincter of Oddi is secured by the injection of olive oil or magnesium sulphate, or both, by the inhalation of amyl nitrite, or by the use of nitroglycerin. The effect of the lavage can be determined by examination of the washings returned through the duodenal tube. The method is an ingenious one, and the apparatus includes a choledochometer for measuring the pressure in the duct system and the tone of the sphincter of Oddi. One obvious risk is that small calculi or debris may be forced into the biliary tree and be impacted in the smaller ducts. The author states that "irrigation is a simple office procedure and can be continued by the patient at home." Thus, after the patient has cleaned his teeth and gargled he now washes out his biliary system before setting out on his day's work! Much fuller investigation and trial of the method are necessary before it can be claimed as either safe or really useful.

[1] *Canad. med. Ass. J.*, 1940, 43, 411.

INJURIES FROM INDELIBLE PENCILS

From time to time there are reports of injuries from indelible pencils. Although the cases recorded are few and far between—generally punctured wounds of the hand or eye—the consequences have now and then involved employers in litigation and considerable costs by way of compensation. In some countries, notably in Germany, special warning notices have been exhibited in offices about the need for immediate medical attention if indelible pencil wounds are sustained. In this country, a few years ago a demand was made for the abolition of the use of copying-ink pencils in Government offices—with what success we do not know. It is not an easy matter to substitute other and less toxic dyestuffs for those commonly used in indelible pencils, but research will probably overcome the difficulties. The most frequently indicted of the dyestuffs employed at present is methyl violet—a member of the triphenylmethane group of dyes, which includes crystal violet and brilliant green—which has recently become popular in the treatment of burns and wounds. The trouble with this valuable group of basic colours is that in high concentration they are powerful protoplasmic poisons. The use of methyl violet for duplicating work and on teleprinter machines is widespread and has not, so far as we know, ever been followed by troublesome effects on the skin of girls engaged in such work except for the inevitable staining, which can readily be removed by simple means. Workers engaged in the manufacture of methyl violet and similar colours are very rarely affected by the dyestuffs. In the grinding and mixing departments they are protected against the possibility of dyestuffs entering the eyes; but, in spite of intense coloration of the tongue and the ready recognition of dyestuffs or their derivatives in the urine, they do not suffer from any toxic symptoms. This immunity is due to the low concentration in which the dyestuff is absorbed. The situation is entirely different when the point of an indelible pencil enters the tissues and rapidly creates a localized zone of intense activity by highly concentrated dyestuffs. Then the filling substances (usually graphite) act as inert foreign bodies. The dyestuff at once begins to dissolve and leads, so long as the concentration is high enough to allow it, to necrosis of the cells with which it comes into contact. In a recent short review of the problem, with a description of two new cases, Mason and Allen[1] state that the skin and its appendages—connective tissue, fat, muscle, cartilage, and bone—may all be affected in regions where the concentration of dye is high. In such conditions the blood vessels become totally necrotic and thrombosed; where the concentration is lower the necrosis may involve only the adventitia, while the media and intima may show round-cell infiltration and proliferation. Secondary

[1] *Ann. Surg.*, 1941, 113, 131.

infection may, according to Ettore, be a factor in producing extensive necrosis of whole digits or phalanges.

The local signs of indelible pencil wounds may be slight At the time of the injury there is some pain for an hour or so, and surrounding oedema. Pain, however, is not a prominent symptom even when the dye has become widely diffused. For a long time a purple exudate may continue to appear from the punctured wound. Incision to remove the "lead" is likely to lead to a refractory ulcer. General symptoms are not common, but according to one author 20% of cases have headache, malaise, anorexia, and general weakness. The general poisonous action of methyl violet is chiefly on the kidneys, but experimental toxicity experiments on mice resulted in congestion of lungs, heart, liver, spleen, in addition, the liver showing capillary haemorrhages and leucocytic infiltration. The treatment of these injuries is immediate complete excision, so that no stained tissue is left behind. The authors state that if this is done the wound can be safely closed with assurance of primary healing. The "lead," they state further, should never be picked out with forceps: this breaks up the foreign body and scatters bits of dye throughout the tissues. In late cases excision of stained tissues is recommended, the wound being left open and allowed to heal by granulation; but this may be impossible if bones, tendons, or other essential tissues are involved. It is important that such injuries should not be tampered with and that immediate surgical assistance should be obtained.

RECOVERY FROM TRICHINIASIS

Trichiniasis is one of the few diseases from which complete restoration to normal can never occur. Although not disabling, as poliomyelitis, for example, often is, its sequels are highly unpleasing to the imagination, since they consist in the harbouring of innumerable living parasites in muscle throughout the body. Unpleasant though this may be, a more important question is whether it has any permanent practical effect. The presence of large numbers of encysted larvae in the muscles might well impair function to some extent, unless some hypertrophy compensated for this; fortunately they produce no inflammatory changes which might otherwise result in a diffuse and crippling fibrosis. Recent sufferers from this disease in England will doubtless be glad to hear that according to Z. Bercovitz[1] there are no permanent sequels at all. He made inquiries about the subsequent history of seventy diagnosed cases, most of whom he actually saw at various stages after recovery from the original acute illness, while the remainder replied to written inquiry. In no case did any disability persist longer than twelve months, and the majority were quite well in much shorter periods than this, usually within one month. The complaint, when it existed, was always of muscular weakness and fatigue, aching, especially on exertion, or tenderness. Although these patients are so soon subjectively normal they have been found to react positively to skin sensitivity and precipitin tests for as long as seven years, and eosinophilia may also persist for long periods. There is, of course, no treatment which will attack the larvae in the muscles, but it is of interest that antibodies to the parasite are developed, and resistance to reinfestation is observed experimentally. The mode of action of these antibodies is peculiar, although it has parallels in other parasitic infestations. J. Oliver González[2] has recently studied it by immersing living *Trichinella* larvae in immune serum, or hyperimmune serum obtained from animals to which successive doses of living larvae had been administered, the effect of which is to enable them to resist doses of a size fatal to normal animals. The action of such serum is to produce a deposit about the oral opening, eventually obstructing it and causing death. When adult worms were placed in such serum, not only was an oral precipitate formed but similar deposits developed around the anal and vulval orifices. Serum from rabbits immunized by injections of an extract of larvae had the same effect on larvae but none on adult worms, from which it appears that there must be some antigenic difference between larvae and adults. These occlusive precipitates are evidently formed by interaction between serum antibody and parasitic secretions.

[1] *Amer. J. trop. Med.*, 1940, 23, 549.
[2] *J. infect. Dis.*, 1940, 67, 292.

PATHOLOGY OF CARDIAC PAIN

Some fifteen years ago it became generally accepted that the pathological basis of prolonged anginal pain (with greater or less shock) was thrombosis in a coronary artery leading to cardiac infarction. Further observations have, however, required a modification of this view. It has become evident that acute cardiac infarction is not necessarily precipitated by coronary thrombosis; where widespread narrowing of the coronary tree already exists, infarction may result from further obstruction by haemorrhage into the wall of the artery, or from reduction of coronary flow as a result of some general disturbance—as, for example, an operation. Moreover, coronary thrombosis may often occur without subsequent infarction if there is an adequate anastomotic circulation. Clearly, therefore, to infer the pathology of the different types of anginal pain is not so simple a matter as was formerly thought. An inquiry by H. L. Blumgart, M. J. Schlesinger, and P. M. Zoll[1] throws some light on these problems. A correlation was made in 355 cases between clinical and post-mortem findings. The coronary arteries were injected, radiographed, and dissected according to the method of Schlesinger. Schlesinger had previously shown[2] that in the absence of coronary disease anastomoses between the coronary arteries, though they exist, are not functionally important even in old age. In seventy-two cases one or more main coronary arteries were occluded or considerably narrowed, yet in none were there symptoms of cardiovascular disease. In all these it was possible to demonstrate a good collateral circulation which had compensated for the obstructed vessels; no infarction or fibrosis had occurred, and cardiograms when taken had been normal. In cases with effort angina as the primary symptom and without valve disease or hypertension, coronary sclerosis with complete occlusion of one or more arteries was always found, but in others with congestive failure and angina as an incidental symptom coronary sclerosis was absent. Sometimes anginal pain is prolonged, but is accompanied neither by the other clinical symptoms nor by the cardiographic changes of infarction. Blumgart and his coworkers have in such cases failed to demonstrate infarction post mortem. They suggest that the cause is thrombosis or other means of sudden arterial narrowing, or alternatively some event which greatly increases cardiac work; they use the term "coronary failure" for such attacks, which may, however, be followed by actual infarction and should therefore be treated by complete rest. Finally, in forty-five cases of acute infarction fresh coronary thrombosis or occlusion was absent in twelve; this last group showed old coronary occlusion: there was one exception—a patient with cerebral haemorrhage.

[1] *J. Amer. med. Ass.*, 1941, 116, 91.
[2] *Amer. Heart J.*, 1938, 15, 525.

CERTIFICATES BY MEDICAL PRACTITIONERS

G.M.C.'s WARNING NOTICE

At the request of the President of the General Medical Council we print below a Warning Notice as to certificates given by registered medical practitioners in their professional capacity.

1. The organization of the resources of the nation for the combatant service generally, for the supply of munitions, for the mobilization and use of labour, for public assistance, and for pensions, gives rise to a host of occasions on which registered medical practitioners are requested to sign certificates of fitness or unfitness for persons under their care. Such medical certificates, to be valid, must by law be signed by registered medical practitioners only, and this trust on the part of the State is dependent upon the maintenance of a reciprocal skill and good faith on the part of the practitioners.

2. The State is accordingly entitled to assume that a certificate signed by a registered medical practitioner is completely reliable and an honest and proper fulfilment of his obligation.

3. Unverified assertions made by the patient himself, personal opinions as to his fitness or unfitness for various forms of service, or for particular hours of work, and other statements not founded on a careful examination of the patient immediately before a certificate is given, or supported by ascertained facts or conditions, are not proper material to support a certificate signed by a registered medical practitioner as his testimony to facts within his professional knowledge.

4. It has recently been made to appear to the General Medical Council by information and evidence received from competent authorities that in a number of instances there has been a relaxation of the vigilance with which such certificates are being signed.

5. The attention of registered medical practitioners is therefore drawn to the terms of the Warning Notice issued by the General Medical Council with regard to the granting of medical certificates.

The Notice states that

"Registered medical practitioners are in certain cases bound by law to give, or may be from time to time called upon or requested to give, certificates, notifications, reports, and other documents of a kindred character, signed by them in their professional capacity, for subsequent use either in Courts of Justice or for administrative purposes."

The Notice further states that

"Any registered practitioner who shall be shown to have signed or given under his name and authority any such certificate, notification, report, or document of a kindred character, which is untrue, misleading, or improper . . . is liable to have his name erased from the Medical Register."

6. The General Medical Council desires to impress upon practitioners that any such certificate should be granted *only on medical grounds* and from the practitioner's personal knowledge of the health and physical condition of the applicant, as ascertained by him at the time of granting the certificate.

J. B. Gillespie and J. C. T. Rogers (*Arch. Pediat.*, 1940, **57**, 652), who record a personal case of enterogenous duodenal cyst in a boy aged 4½ years, state that in the nine previously reported cases the patients' ages ranged from the newborn period to 15 years. The recognition of the condition was due to early development of obstructive symptoms. In the newborn period a pre-operative diagnosis of pyloric stenosis was not infrequent. Vomiting had been the only constant symptom. Abdominal distension and vague discomfort occasionally occurred in the older patients. An abdominal mass usually in the upper quadrant has been the predominant physical finding. Of the recorded cases, including the authors', eight were treated by operation and four patients made a good recovery.

Local News

ENGLAND AND WALES

Fracture Treatment under Emergency Hospital Scheme

Mr. Ernest Brown, the Minister of Health, attended the annual meeting of the Central Council for the Care of Cripples on March 28. In the stress of war, he said, the "civilian" cripple, whose condition was due to accident or to one of the crippling diseases, must not be forgotten. He relied upon the Central Council, which had already done so much, to see that this vitally important piece of social welfare was not neglected. Turning to the arrangements for the treatment and rehabilitation of the war-injured, Mr. Brown said that under the Emergency Hospital Scheme nineteen special orthopaedic centres had been established in England and Wales, and to these the majority of serious fracture cases, military or civil, would be transferred. At each centre there was a skilled surgical staff—in one centre an American team of orthopaedic surgeons—and a physiotherapy department with trained masseuses. In addition facilities were being developed at each of these hospitals for physical training, games, and occupational therapy. It was realized that nineteen orthopaedic centres was not enough, and the Ministry was at the moment engaged in bringing into the fracture service a number of other hospitals at which there were surgical staffs competent to treat fractures. After the war some of the special hospitals would disappear as the buildings in which they were housed returned to their normal uses, but others would remain as a permanent addition to the country's orthopaedic services. The new hutment hospitals were not a collection of old Army huts, doomed to dilapidation in the course of a few years, but soundly constructed pavilions, built often in brick and concrete, and medical experts had assured him that they made excellent hospitals of which no country need be ashamed. He added that the Ministries of Health, Labour, and Pensions and the Department of Health for Scotland were in close contact over the question of the further rehabilitation of war-injured in the sense of training for a different job if the disability rendered it impossible for the man to resume his old occupation. He hoped that an announcement would shortly be made as to the proposed plans. At the business meeting of the Central Council Dame Agnes Hunt was re-elected President, and the Earl of Dudley and Sir Geoffrey Peto Chairman and Vice-chairman respectively.

Co-ordination of Tuberculosis Services

Regionalization for the tuberculosis services of local authorities was urged in a paper by Dr. G. Lissant Cox, central tuberculosis officer for Lancashire, at a recent meeting of the Joint Tuberculosis Council in London. The main points urged by Dr. Cox were that many local authorities are not large enough to deal adequately with the prevention and treatment of tuberculosis on modern lines, and that some form of combination or regionalization such as already exists in Wales is desirable throughout Great Britain. The county and county borough councils for tuberculosis schemes in England (leaving London out of account) deal with populations ranging from 50,000 to 2,000,000, and although all the authorities are supposed to have schemes similar in efficiency and completeness, this is not in fact the case. There are relatively small counties and boroughs with efficient schemes, but these have been fortunate in having a person of exceptional ability as director or an area with peculiar advantages, and in general it must be said that for so complicated and expensive a work of public health a large authority is in a position to provide a modern scheme more economically than is a small and poor authority. There is already ample legislation to enable local authorities to combine and form general committees or boards for carrying out their statutory duties, but there are only three such combinations in England, those relating to the areas of Staffordshire, Gloucestershire, and Warwickshire respectively, and in those areas the efficiency of combination has been demonstrated. Nine years ago it

Joint Tuberculosis Council recommended that rural areas with a population of 200,000 and urban areas with one of 300,000 could be managed by one whole-time tuberculosis officer with proper assistance, but, of course, the adequacy of areas differs with the aspect of tuberculosis work in view. For isolation, nursing, and some minor surgical treatment a small area may function quite well, whereas it could not function efficiently and economically for more specialized treatment—for example, for non-pulmonary disease, especially of bones and joints, for children and adults, or for major thoracic surgical work. Dr. Cox pointed to examples of regionalization, such as the Welsh National Memorial Association, which conducts the diagnosis and treatment of tuberculosis in Wales and Monmouthshire, and, in more general fields, the scheme of the British Hospitals Association and the Emergency Medical Service, with its twelve regions for Great Britain. These regions, however, do not lend themselves suitably to the purpose of tuberculosis areas, but Dr. Cox urged that some scheme of regionalization, with due regard to the areas of county councils, was highly desirable. Legislation will, of course, be required to enforce a combination of local authorities held to be too small to provide efficient schemes.

Tuberculosis in Shelters

At the same meeting Dr. F. R. G. Heaf presented a memorandum on tuberculosis in shelters. The series of recommendations which it contained, and which were accepted by the council, included the following: that the recommendations of the Horder Committee be carried out as soon as possible; that the provision of special shelter accommodation for the tuberculous in densely populated areas be encouraged; that a special effort be made to examine more frequently contacts of known tuberculosis cases using Anderson shelters; that all children be removed from Anderson shelters used by tuberculous persons; and that no tuberculous person be allowed to use a school shelter. Many of these recommendations, especially those for segregation, can only be applied during periods of comparative quiet, and the point was therefore stressed that action should be taken while it was possible to enforce regulations so that a certain adherence to order and routine may be expected in times of extreme emergency.

Reports of Societies

MASS RADIOGRAPHY AND TUBERCULOSIS

At a recent meeting of the North-Western Tuberculosis Society, held at the Tuberculosis Offices, Manchester, Dr. G. JESSEL, Consultant Tuberculosis Officer, Lancashire County Council, read a paper on "The Role of Mass Radiography in Tuberculosis."

Dr. Jessel said that the diagnosis of early tuberculosis still left much to be desired, despite the marked increase in x-ray facilities in recent years. This was largely inherent in the pathology of the disease. Radiography was only capable of recording the shadows of the moment, which might be characteristic of one or more diseases, and, in the case of tuberculosis, did not necessarily indicate activity. A full clinical investigation of suspicious cases was essential. Mass radiography could be carried out in several ways: fluoroscopy was the cheapest but did not provide a permanent record; miniature screen photography overcame this defect, but its use on a large scale necessitated special apparatus and very careful organization. Miniature mass radiography could provide, under favourable conditions, a rapid method of weeding out those who presented abnormal skiagraphic appearances, and these suspects should be referred to a tuberculosis dispensary for detailed investigation. Persons classed as healthy should be re-examined at intervals, especially in the so-called dangerous industries. Miniature mass radiography of entrants into industry, the Army, etc., had already been tried, and, subject to financial considerations and with certain reservations, might be more generally used as the necessary centres, apparatus, and personnel became available. Definite standards of technique and interpretation would be essential for comparable results of value. The interpretation should be made by teams of experienced radiologists and tuberculosis officers or chest specialists. The examinations should be regarded as part of a general health survey and should not be related in the public mind specifically to tuberculosis. The work should not be carried out at a tuberculosis dispensary, which should remain the centre for detailed examination of suspects.

Dr. A. K. MILLER referred to the economic aspect of this health survey, which would certainly throw workers out of employment, and on that account would probably meet with some opposition. Provision should be made for these unfortunates. Dr. J. CRAW said that of approximately 1,800 lead miners examined by mass radiography, 0.64%, who had previously said they were fit, were found to be tuberculous. Dr. WYNNE-EDWARDS said that experiments he had made so far with a Leica camera had been unsatisfactory owing to distortion. He added that mass radiography of Storm Troopers in Germany had revealed that 8% were tuberculous.

Wartime Problems of Tuberculosis

At the same meeting Dr. D. P. SUTHERLAND, Senior Tuberculosis Officer for the city of Manchester, spoke on "Some Observed Effects of the War to Date." He said that enemy action and E.M.S. requirements had caused a diminution of approximately 10% in the number of beds available. The general evacuation of the towns at the beginning of the war was, on the whole, probably beneficial; children, for example, were dispersed widely and were in many instances removed, at least temporarily, from heavily infected relatives. A later evacuation resulting from war damage to the dwellings of the tuberculous was unfortunately less innocent. There was danger of infection, as the dispossessed tenants were rehoused either in empty houses or in houses already occupied generally by non-tuberculous persons. Concentration and crowding resulted, not only in individual houses but in the immediate vicinity of the bombed town. The fact that the economic circumstances of the general population were now much better than for years might lead to improved nutrition and increased resistance to the results of infection. Rationing might, however, counteract this. The removal of so many cases from hospitals had been associated with an increase in notified cases so far. In a recent broadcast appeal for more nurses for fever and tuberculosis work the Ministry of Health had emphasized the danger of possible increase in the so-called infectious diseases; no less important was the danger from endemic tuberculosis. The difficulties of staffing sanatoria had been steadily increasing for years before the outbreak of war, and competition with Service requirements had since aggravated the position. There was a very large reservoir of trained staff waiting to deal with casualties as yet non-existent; they had nothing to do and were in most cases anxious to be usefully employed. In addition there were thousands of partly trained personnel, many of whom could be, but were unwilling to be, usefully employed in helping with the treatment and care of the tuberculous, who had great need of their services, preferring instead to do alternative work for which there was no call. As a result there was a diminution in treatment and isolation at a time when these things were most necessary.

In the discussion which followed Dr. Sutherland's paper members were unanimous that long hours in crowded munition works and loss of rest due to A.R.P. and Home Guard duties had resulted in the relapse of old quiescent cases. There were many "T.B. minus" cases in the Home Guard.

W. F. Burdick (*J. Pediat.*, 1940, **17**, 654), who reports ten cases in children aged from 3 weeks to 13 years, illustrates the rarity of peptic ulcer in childhood by the fact that out of 21,231 admissions to a children's hospital there were only 8 cases, 6 of which were duodenal and 2 gastric. He advocates a freer use of x rays in children suffering from anorexia, retarded growth, vague abdominal distress, and constipation. By so doing the diagnosis may be made before haemorrhage or perforation occurs.

Correspondence

Bureaucratic Surgery

SIR,—Those who work in the E.M.S. have for some time been receiving examples of medical bureaucracy in the form of instructions to do this or that, but particularly not to do this or that. Many consultants of long and varied experience have responded to these orders with a shrug of the shoulders and a rather unwilling compliance, in the very proper belief that they should always be loyal to the service which they conceived to be of such great importance to the community at this time. One of the latest orders, however, far exceeds any yet issued in its restrictions, for general surgeons are told not only that "all head injuries should be transferred to special neurological units" but that "the term 'head injury' includes scalp wounds in which there is no evidence of bone involvement." I suppose the implication is that the general surgeon is so dull that he may overlook the possibility of injury to bone or brain, while the specialist neurosurgeon is immune from such errors.

We have all of us in our time laughed at the story of the American dentist who had on his visiting card, "Specialist in the extraction of the right upper canine," but our hilarity was evidently misplaced, for it is obvious to anyone who thinks that there are special points about the relation of this tooth to the antrum, and about the dexterity required to remove upper right-sided teeth, which must demand specialized practice that could only be acquired by one willing to leave all the other teeth to similarly specialized treatment. What about dividing the scalp wounds into those of the right and left sides, possibly to be dealt with by right- and left-handed neurosurgeons respectively?

The question of extreme specialization is nevertheless too serious to be dealt with entirely by friendly banter. Having a mental make-up which makes it impossible for me to confine my interests to one small branch of surgery, I thought that my reactions to these many instructions were peculiar and individual, and I should certainly not have ventured to draw attention to the subject had I not found in conversation with colleagues that they were reacting in a like manner, and that a certain feeling of antagonism was arising which might easily affect the efficiency of the service as a whole.

It is, of course, clear that some degree of specialization is necessary, and I am not prepared to say quite where the line of distinction between the general consultant and the specialist should be drawn, but I feel sure that there are undesirable extremes in both directions. It is easy to understand how comforting it must be to those in charge to be able to forestall possible public criticism by the statement that all cases are in the hands of "specialists," but when this means, to take an example, transferring, say, cases of nerve suture from the hands of general surgeons having a big experience of such work in the last war to comparatively junior orthopaedic specialists whose experience is likely to be much less extensive, the apparent advantage to the public surely rests entirely in some hypnotic influence of the term "specialist."

By retaining the services of the staffs of the large voluntary and municipal hospitals the E.M.S. very wisely determined that the more senior members of the service should be men of wide experience and sound judgment (the most important of all surgical attributes for consultant and specialist alike), and it does seem rather derogatory to issue orders to men of such standing; surely the more acceptable method, when it is decided that some mode of treatment has given good results, would be to issue a pamphlet on the subject for the "information" of those handling the cases. On occasions the E.M.S. has adopted this policy, and those in the service have found the information provided very acceptable, but in the case of orders and instructions who is in a position to be his brother's keeper, who decides what methods of treatment are correct, and who demands that no other treatment shall be used? How could the world have received the benefits of the work of Lister, Horsley, Winnett Orr, and a hundred others if this dictatorial atmosphere had cramped their originality?

The question of the State control of medicine is now very much to the fore, and many who have felt an innate repugnance to the idea have recently been asking themselves whether their opposition was not merely unwarranted prejudice, and in consequence, recognizing virtues in such a system, their intransigent attitude has changed to one of tolerance, with possibly a slight feeling of shame at this betrayal of their natural instincts. But if State medicine is to mean bureaucratic control of the actual technical details of treatment and the complete exclusion of individualism of thought and action, it may be that as a profession, and in the true interests of the science and art of medicine, we should think again before accepting it.

Lest it be thought that this letter merely represents crabbing criticism and lack of sympathy with obvious administrative difficulties, I should add that I have been interested in the E.M.S. since long before the war started, and am anxious that the service should be as perfect as possible from the patient's point of view. This, I believe, can only be attained if competent surgeons are still allowed to retain their individuality and to come to their own conclusions as to the merits of any particular form of treatment, since otherwise their interest flags and their duty suffers accordingly.—I am, etc.,

London, W.1, April 6. NORMAN C. LAKE.

Rehabilitation of the Injured

SIR,—In your informative leader on rehabilitation of the injured (April 5, p. 519) reference is made to the Albert Dock Hospital as having a rehabilitation department for one class of occupation only—namely, seamen. This gives a rather erroneous impression. It is true that it is a branch hospital of the Seamen's Hospital Society, but it caters not only for seamen but for all workers in and about the Royal Docks, and these comprise ship repairers, stevedores, railwaymen, factory workers of many grades, millers, gas workers, office workers, and a host of others. Even if seamen alone were taken, each ship can be considered as a self-contained village with a number of different occupations practised by its inhabitants. In addition to the A.B.s there are firemen, greasers, marine engineers, refrigerating engineers, electricians, cooks, and clerks, and this list can be multiplied many times. The rehabilitation department therefore deals with a very wide cross-section of the working community, and the only way it differs from a general hospital is that it is concerned with men and youths only.

In addition to able-bodied seamen, stevedores, and firemen, those attending the department at the present time include ships' officers, clerks, a cook, an engine driver, a van-boy, a painter, some demolition workers, and men from a variety of other occupations, and it is because of the different types of employment to which the men have to be returned that it has been necessary to evolve a form of rehabilitation work which would cover all. Mr. E. A. Nicoll in his absorbingly interesting article (p. 502) emphasizes throughout the fact that he is dealing with a specialized type of work in the colliery district. His methods are designed to rehabilitate the men in particularly arduous labour, often undertaken in cramped conditions.

It would be very interesting to hear from him what the men's reactions are to the chart of their weekly progress. In the better type, I can believe that the chart would act as a stimulus to further endeavour, but in others I should imagine that by focusing the attention on the disability it is apt to induce a state of introspection and consequent inhibition of effort. My own efforts have always been aimed at distracting the patient's attention from the injured part, although in selected cases benefit is produced by deliberately training the damaged limb or back.—I am, etc.,

London, W.1, April 9. H. ERNEST GRIFFITHS.

Treatment of Burns

SIR,—The Dickson Wright method of treating varicose ulcers with tightly applied elastic adhesive bandages, and the closed plaster method of Winnett Orr of treating deep bone sepsis introduced a new conception into the treatment of localized septic wounds. The success of these methods of treatment

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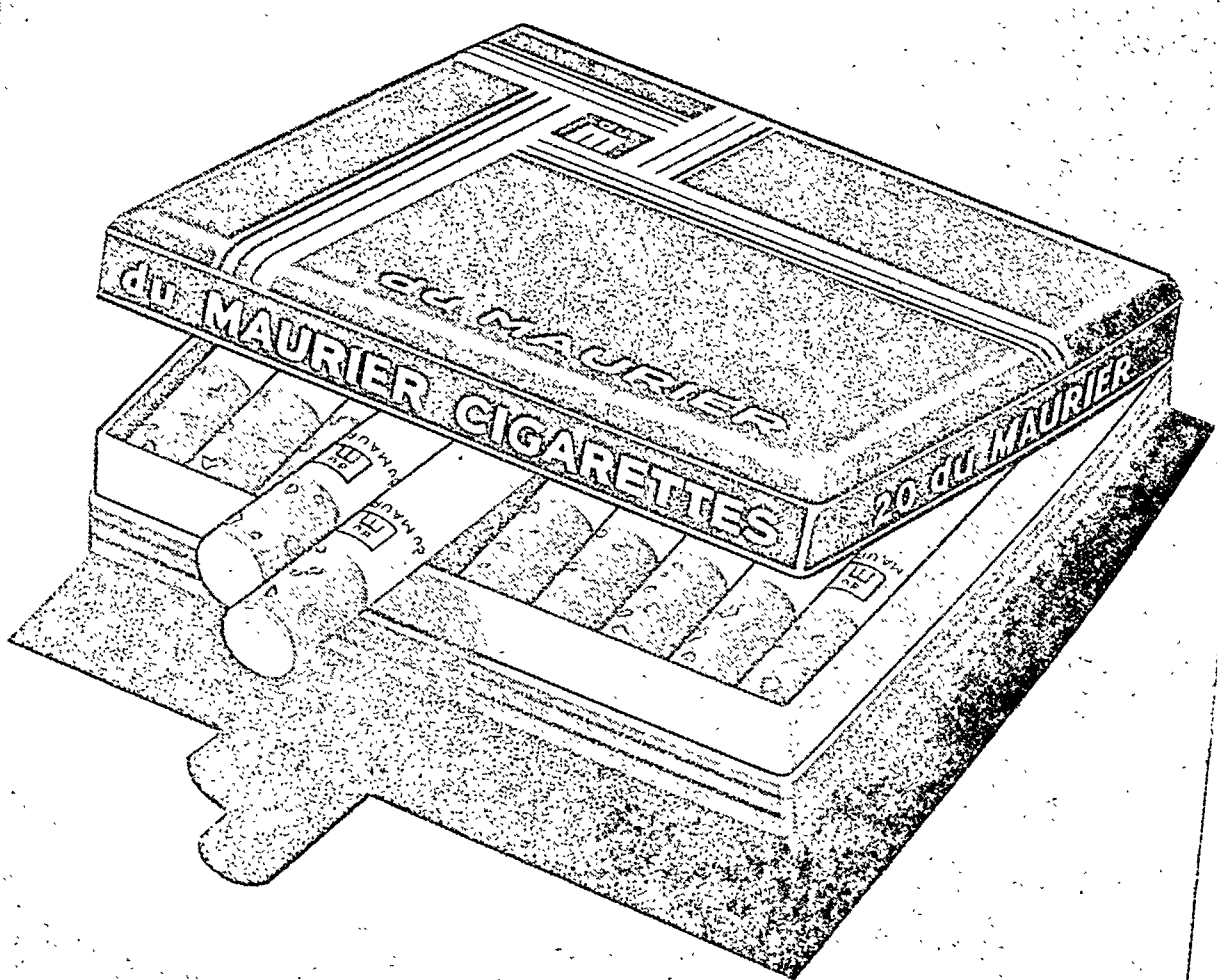
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is due to certain underlying principles common to both. They can be stated briefly as follows: (1) Elimination of tissue tension. (2) The bactericidal effect of wound discharges retained in intimate contact with the wound. (3) The "cushion" effect of a fluid dressing on the wound. (4) "Protection" effect produced by local immobilization and infrequent change of dressings. (5) Beneficial psychological effect produced by freedom from pain and from the mentally disturbing effects of frequent painful dressings, anaesthesia, baths, or irrigations.

For the last twelve years I have employed these principles in general practice in the treatment of wounds, clean or septic, of abrasions of the skin surface, of boils and carbuncles, and also of burns and scalds. Here let it be quite clearly understood that I am dealing only with small areas of burns and scalds, so that the question of treatment by tanning methods to prevent secondary shock does not arise. The treatment now being discussed applies only to local burns and scalds, where the considerations that arise are: (1) the formation of a clean granulating wound that later can be allowed to heal by epithelization or by skin grafting; and (2) the comfort and convenience of patient, doctor, and nursing staff.

The leading article in the *Journal* of March 29 (p. 484) calls attention to the importance of the control of sepsis in burns. In the same issue (p. 469) Dr. J. M. Robson and Mr. A. B. Wallace advocate the use of glycerin–sulphonamide for its antiseptic properties. Others advocate the use of flavine incorporated in a tannic acid jelly, while others press the claims of gentian violet and other aniline dyes. I would here like to suggest an extended trial of the occlusive method of treating burns, using as a bactericidal agent that which I believe to be the best of them all—the seropurulent discharge of the wound itself. I see no logical reason why sepsis from a varicose ulcer, an infected bone injury, or from a boil or carbuncle should be treated differently from sepsis arising in a burn or scald. Within the limited scope afforded by general practice I have treated them on the same lines as I have treated sepsis elsewhere, and have never had cause to regret what I believe to be a 100% run of successful results. Excluding tetanus and gas gangrene, I believe the principles set out above apply to sepsis whatever the nature of the invading organism.

The occlusive dressing technique is simple. Vesicles, when present, are ruptured, but the overlying epidermis is not removed. The burned areas are swabbed with dry cotton-wool and gross contamination is removed. The surrounding healthy skin is shaved and cleaned with aether. meth. A piece of white lint is covered with a layer of any bland ointment (I use ung. resorcin. c. amylo) and placed over the wound so that its edges reach just beyond the margin of the wound. This is covered by strips of elastic adhesive bandage applied on the stretch two layers deep, the outer overlapping the inner layer, or the bandage may be wound in spiral fashion round a limb. This dressing is left *in situ* for seven to twenty-one days, being reapplied after recleaning the wound and its surrounding skin as before.

In this fashion a second-degree burn may be completely healed in three to six weeks, with perhaps only one or two changes of dressings. In the case of a third-degree burn a healthy granulating wound will be found ready for skin graft after two to three weeks. Apart from satisfactorily dealing with sepsis and the comfort of the patient, this occlusive type of dressing has the following advantages: (1) It is not bulky and it "stays put"; even when the feet and legs are involved in second-degree burns the patient is able to walk about in comfort after a few days. (2) There is a drastic economy in time to doctor, nursing staff, and patient. (3) There is a drastic economy in the use of dressing material. (4) The patient can usually return to useful work two or three weeks before the complete healing of the wound, providing he can manage to avoid subjecting the dressing to contact with water.—I am, etc.,

Derby, March 31. E. C. DAWSON.

SIR,—As an ignoramus on the subject I have followed with interest the oscillations of the experts who advise on the treatment of burns. Tannic acid, acclaimed as a life-saver a few years ago, seems to be going out of favour. Fomentations, specifically condemned in a Ministerial pamphlet some months ago, has received a recent word of commendation (Mowlem, *Proc. roy. Soc. Med.*, February, 1941, p. 221).

I would ask one question and make one comment. What became of the treatment by paraffin wax which had a considerable vogue in the last war? Those interested in the subject will find laudatory articles in both volumes of the *Journal* for 1917. With cessation of hostilities the method seems to have faded into oblivion.

The donor area from which Thiersch grafts have been taken has suffered many things at the hands of many surgeons. One shudders when one reads of sepsis developing under tannic acid treatment when experience has shown that perfect healing will occur under a sterile dressing of gauze and wool, left in position until the scab separates in the course of two or three weeks. Similar treatment will give good results in the case of a second-degree burn if the blisters are intact so that they can be cleansed and punctured, not cut away, with aseptic precautions.—I am, etc.,

Northampton, April 6. C. C. HOLMAN.

SIR,—I would advocate the use of paraffin No. 7 in the treatment of burns at aid posts. It gave good results in the last war, and I have found nothing better for domestic burns. It can be easily stored, kept clean, and has some antiseptic value. The melting of the wax should give reasonable asepsis. As it is applied warm, shock is minimized: it is a soothing application. Perhaps a safe percentage of novocain could be added. Anyone can learn how to apply it.

The teaching in E.M.S./Gen./343 will be confusing to first-aiders. They have been told to avoid carron oil and greasy applications, yet here is vaseline recommended; and the tubes of tannic acid jelly with which first-aid parties are provided are to be discarded. Whatever be the best hospital treatment, a practical and authoritative statement on first aid seems called for. How is vaseline to be sterilized and kept sterile in an aid post? Vaseline, like carron oil, can too easily become a menacing mess.—I am, etc.,

Gourock, April 5. GEORGE ADAM, M.D.

Tuberculosis in Wartime

SIR,—In the annotation on tuberculosis in wartime (March 22, p. 445) the commentator draws attention to the unsatisfactory features of institutional treatment of tuberculosis, and remarks that even before the war only an insignificant number of sputum-positive patients were discharged as quiescent. Surely this latter statement is a slip of the pen, for it is difficult to see how any patient with a positive sputum, however good his general condition and no matter how free from toxic signs he may be, can be regarded otherwise than as an active case of pulmonary tuberculosis.

In the review by Rusby and Heaf quoted by your commentator attention is again drawn to the large numbers of sputum-positive patients outside institutions who constitute "a vast pool of infection in the country." With wartime conditions prevailing it is inevitable that in the coming years we shall be faced with a grave increase in the incidence of the disease, and that the need for early diagnosis and effective and thorough institutional treatment will be even greater than before the war. Are we to regard these sputum-positive cases mingling with the general population at present as evidence of the failure of our anti-tuberculosis work and as a reflection on the efficiency of our scheme of treatment? Rather let us say that our hospitals and sanatoria have done their best with the clinical material provided and with the resources at their command.

If we look to the future, however, we must be driven to the conclusion that if we are to deal adequately with the cases of the post-war era a reorganization of our scheme will be necessary. Early diagnosis will remain the foundation stone of our edifice, and there will be little doubt among tuberculosis workers that mass radiography will provide the solution. Given early diagnosis, prompt use of collapse therapy will shorten the period of institutional treatment and should greatly diminish the number of sputum-positive cases, thus gradually eliminating our "pool of infection."

Is our present tuberculosis scheme adequate, as it stands, to deal with this problem, and, if not, what reorganization will be necessary? In certain areas the scheme administered by the local authority is admirable, in other areas most definitely not so admirable, and in our coming onslaught on

the disease uniformity will be essential. For this some form of central control, such as a National Tuberculosis Board, should be considered. Given our central board, we can work our scheme on a regional basis, with each region equipped with a central hospital where facilities for all forms of collapse therapy are available, and with a specialist staff employed on a full-time basis. From our hospital we pass to the regional sanatoria, which are intended for sanatoria and not, as at present, for sanatoria-cum-hospitals-cum-homes for incurables. Included in the scheme would be a rehabilitation centre and colony, for it is idle to suppose that in our "brave new world" we shall see nothing but early unilateral cases who one and all respond to a pneumothorax. In our shadow scheme we must also consider one other vital point—the education of the public—for without this our plans will most surely fail. The organization for this is in being in the National Association for the Prevention of Tuberculosis, which could be incorporated in the general scheme.

The cost of such a scheme as has been outlined would certainly be great, but, taking a long view, the results should more than repay the expenditure, and perhaps we might yet see the day when our sanatoria would come to occupy the same position as our small-pox hospitals do now.—I am, etc.,

Tor-na-dee, Murtle, March 26. R. Y. KEERS, M.D.

Collecting Casualties in Invasion: A Scheme for Kent

SIR,—The medical service of the Home Guard is at the moment in so fluid and formative a condition that even a few weeks' experience may be of interest to your readers. For some six weeks I have been the senior medical officer of this service in Kent, and as such responsible for its organization and character. Not until quite recently have I seen any Army Orders or other instructions which concerned themselves with this particular medical service, and I have good reason to believe that even now the authorities are far from anxious to lay down hard-and-fast rules which experience might prove to create more difficulties than they solved.

My first discovery was that there was practically no resemblance between the duties of a regimental medical officer and those of a Home Guard battalion medical officer. Such resemblance as there was concerned only their sanitary and training duties. When it came to dealing with casualties the resemblance abruptly ceased. There can be no question of establishing a single regimental aid post for a country battalion of the Home Guard, since it may be spread over a hundred square miles and have small detachments on guard at almost as many separate road junctions and other defence points within the area. The same difficulty has faced the medical officers of mechanized regiments, in which vehicles may at any time become very closely analogous to a Home Guard defence point. I do not know how the regimental problem is being solved, but it is evident that the Home Guard battalion has at least one advantage—that is, the area in which it will sustain casualties is limited by counties and not by continents. This fact is of no small importance.

Those who have followed the argument so far will probably say, "Well, where is the difficulty? There are air-raid wardens everywhere, who will ring up Control and have an ambulance sent out to take your casualties to hospital without requiring the services of a battalion medical officer." Those who still believe that this simple mechanism will surely be available during invasion are dangerous optimists. Whether invasion comes from the sea or the air, or both, it must be the first aim of the enemy to disorganize means of communication and so prevent the arrival of reinforcements. This must surely mean attacks of great strength on the neighbouring towns (including hospitals), and upon all roads, railways, and bridges. "In great strength" means something that we have not yet experienced in this country, but Rotterdam knows what it meant a year ago, and we should do well to learn its lesson. That lesson is clear enough. In areas affected by invasion we must arrange to disperse our casualties, or leave them dispersed, during the actual fighting, partly because we shall not be able to do anything else, and partly because it would be sheer murder to seek to aggregate them in vulnerable centres such as town hospitals and first-aid posts. I have found that those in the best position to visualize the possibilities of invasion heartily approve of the dispersion of casualties.

It did not take one very long to reach this conclusion, and the next step was to arrange for the reasonable care of casualties until it should be both possible and wise to send them to hospital. This could only be done by enlisting the assistance of doctors who could influence householders in their own districts. About forty Home Guard medical officers have now been enrolled in Kent. Most of them are battalion M.O.s, but some are responsible for groups of four to eight battalions, and others are associated with companies or even platoons. These officers and I have aimed at setting up casualty collecting posts throughout the county at such intervals from each other that it will not be necessary to carry any casualty more than one mile. No elaborate provision is or can be contemplated, but we hope to ensure that the injured shall have a roof over their heads, rest, warmth, simple cooking, and such skilled care as may be possible. We have a form which we hand to householders. The response has been extremely encouraging, and there are already a great number of casualty collecting posts in various parts of the county. In many instances it has been possible to arrange that a retired doctor or a dentist with a medical qualification shall take the responsibility of two or three such posts. In others the local doctor (who is often also the battalion M.O. or a member of the Home Guard) will look after them as best he may. A trained nurse is available for others, and there are many helpers with various degrees of training who are more than willing to assist in time of need.

Although the Home Guard medical officers are bringing these casualty collecting posts into being, their duties do not usually include attendance at them in emergency. Many of these doctors have their duty posts—for example, F.A.P.s, E.M.S. hospitals, and so on. The Home Guard medical service, as it exists in Kent, is in fact an administrative and not a treatment service. It is in this fact that it differs so strangely from the R.A.M.C. In this manner, within a very short period, we have gone far to ensure that no casualty, Home Guard or military or civil, shall be left neglected by the roadside or in some unsuitable cottage until the fighting is finished and road traffic resumed.

I should like to discuss the adaptation of this plan to towns, and also a hundred and one other points which have arisen, but many of these are more suitable for conference than print, and your space is too valuable for further presumption on my part.—I am, etc.,

GORDON WARD,
Senior Medical Officer, Kent Zone, Home Guard.

Sevenoaks, April 7.

Mobile Unit in Action

SIR,—Allow me to endorse Dr. F. J. Henley's final dictum in his letter on this subject (March 22, p. 458): "Use these units more and they will save more lives," but to whom does he or do we address this request? He asks whose specific responsibility it is in Southwark to send for the unit. I expect it is the same in Southwark as in this borough and all other boroughs: Controls call out the unit on the advice of the incident officer, if there happens to be one present, but more often on the advice of stretcher-bearers, or rescue party, or even a part-time warden. Surely these expensive units are worth more consideration.

We are told we are on the eve of invasion, when casualties may approximate to the figure which we were originally taught to expect; may we as medical officers of mobile units not plan so that we may be of more use? Local A.R.P. committees may not have used mobile units as much as they should, and perhaps rightly too, because except in a few cases the incidents have not been large enough to absorb all their functions, which were laid down very early by the Ministry as follows: (1) for trapped cases, (2) for urgent cases requiring treatment *before removal*, (3) as casualty clearing stations, (4) for improvising a hospital should hospitals and first-aid posts be destroyed. Except perhaps in the case of (1) and (2) most units (according to correspondents) do not appear to have been utilized. There is no reason, however, why they should not be prepared to act in these capacities, and A.R.P.

committees would be well advised to co-operate with medical officers of mobile units and so enable them to be ready for future action.

I suggest that the criticisms and suggestions made in the *Journal* by experienced M.O.s of mobile units might be met by some such scheme as the following:

(1) At each express message where casualties are reported the M.O., a sister, and the incident doctor's deputy (as suggested by Dr. Henley) should go out with an ambulance arranged as a resuscitation unit, as indicated by Dr Peter Cardew (January 18, p. 100). If the casualties are few and slight the deputy through the warden gets in touch with Control and asks for the next incident. If the incident is of some magnitude, he calls out the unit, mobile van, etc., and he then works in conjunction with rescue and stretcher parties as Dr. Henley suggests: (*a*) sees that no casualty is carelessly handled; (*b*) sees that shock treatment is started and maintained as soon as the patient is at all accessible; (*c*) keeps account of the number of casualties rescued and number to be rescued; (*d*) acts as casualty clearing officer, directing ambulances to the various hospitals and first-aid posts and not all to the nearest hospital; and (*e*) affixes red, blue, and white labels to casualties according to severity of wounds, priority of treatment, and destination.

(2) Personnel of the mobile unit should be interchangeable with those of other units so that the staff of each unit can be easily augmented.

(3) The personnel of mobile units should be trained in the team work of improvising a hospital.

I should be glad to hear from M.O.s of mobile units so that a meeting may be convened and this scheme or a similar one embodying their experiences can be presented, perhaps through the agency of the British Medical Association, to the proper authority.—I am, etc.,

J. F. MACKIE.

London, S.E.22, March 27. M.O., Camberwell Mobile Unit.

A First-aid Timetable

SIR,—In pursuance of the idea and burden of your leading article of two weeks ago about the tendency to over-elaboration of first-aid work, I have a suggestion for instructors. It is that they set their description of any and every case, real or otherwise, against a time schedule—that is, they indicate what could and should be done within the periods of, say, half a minute, one minute, five, ten, twenty, and so forth. Within such a place as a first-aid post the staff might, through transport difficulties, etc., find themselves in the position of nurses, and would then have to do such work as the recording of temperature, pulse, and respiration, and repeat at intervals spread perhaps over longer periods still.

Thus: 1. *Immediate, Half-minute.*—Remove from electric contact; place in a posture favourable to respiration: close an open pneumothorax. (The first thing, of course, would be to observe whether there is unequivocal evidence of death.)

2. *One Minute.*—Haemorrhage: direct or digital pressure; throw a covering over to protect against chilling; tourniquet, if needed; examine for fractures if there is time, and apply, so far as possible, postural treatment for them, including the clavicle.

3. *Five Minutes.*—Splints to forearm and ankle; for worse fractures, place on a stretcher and remove the patient without splinting, though secured to the stretcher as firmly as time will allow; cover up burns if not already done.

4. *Ten Minutes.*—Count pulse and respiration rates in all cases of head, thorax, and abdominal injury (even though there be no external wound); examine for further wounds; put splints on major fractures; prop up in Fowler's position if necessary; dress burns.

5. *Twenty Minutes.*—If washing facilities are available and lotion, the wound, after first cleansing the surrounding skin, may be uncovered and inspected for foreign bodies and so forth; look out for and record signs of cerebral compression (specified in detail), internal haemorrhage, and peritonism; treat for shock and (controlled) haemorrhage by rectal injection of really warm 1/2% saline; hot bottles between the thighs and to arm-pits; examine badly crushed limbs for evidence of vitality (colour, temperature, and pulse to be felt); and be prepared on medical instruction to apply a tourniquet if the state of the limb is so bad as to prejudice the well-being of the injured man.

The above may be found suggestive: it could obviously be elaborated and improved on.—I am, etc.,

W. REGINALD WILSON.

April 6. M.O., First-aid Post, Doncaster.

Radiological Diagnosis of Peptic Ulcer

SIR,—In base hospitals and elsewhere all over the country numbers of H.M. Forces suffering from gastric symptoms are being examined radiologically. This provides a suitable opportunity to assess the value of the radiologist in this field and also to define his responsibilities.

Enlightened criticism has recently been directed against a tendency on the part of physicians and surgeons too readily to accept a radiological report. Dr. Charles Newman at a meeting this week reminded us that a "coin in the slot" attitude towards a radiological diagnosis can be most pernicious. As a radiologist I heartily endorse this. This attitude, however, is part of a vicious circle. Too little responsibility has in the past been placed upon the individual radiologist. A patient is sent for examination, a report is received, and the physician notes what "they" in the x-ray department have to say. Sometimes, happily infrequently, a picture or two of the stomach is considered sufficient. Seldom, however, even when the report is particularly nebulous, is the radiologist charged with the case and cross-examined as to the true significance of his findings. As a result it is little wonder that reports often take the form of a brief stereotyped formula, which irritates the physician and may convey to him little useful information.

The duodenal ulcer is a case in point: the search for this lesion requires the most precise and meticulous observation, yielding evidence of almost every stage of inflammatory change and of the sequelae of healing. A precise interpretation, or at least a statement of the probabilities when the findings are abnormal, should be demanded of every radiologist who undertakes a barium meal. In demanding it, the physician on his part will gain a better appreciation of the scope of radiology, of its ability to give more valuable information than much that is given now, and also of its limitations; while a reasonable share of the responsibility would be a healthy stimulus, welcomed by all radiologists who are prepared to stand or fall by the value of their work.—I am, etc.,

London, W.1, March 29. A. M. RACKOW.

Dyspepsia in the Services

SIR,—As a sidelight on the prevalence of dyspepsia in the Services—and among the civil population from whom they are recruited—I had a conversation some time ago with a member of a firm of retail chemists who own about a dozen shops in an industrial area. He asked me to guess the amount of alkaline powder sold by his firm each month. In putting the figure at a couple of hundredweight I imagined I should be well outside the mark. To my surprise he said that the amount averaged about half a ton per month.

It would be interesting to know to what extent digestive troubles are *post hoc* or *propter hoc* if this is any indication of its consumption over the whole country.—I am, etc.,

Brookwood, Surrey, April 5. H. M. STANLEY TURNER.

Medical Planning Commission

SIR,—It appears to me that the solution of this problem is comparatively simple. Two main essentials stand out: (1) the planning should be started as soon as possible: (2) the younger members of the profession must have a say in the matter, as they are the ones most concerned. Let the present commission get to work now and commit their proposals to paper. After the war the present commission should resign and a new commission be elected on which the youth of the profession would be fairly represented. This new commission could then review the findings of the original commission in a comparatively short time, as most of the spade-work would have been done.—I am, etc.,

Newbury, April 8. H. WARBURTON LEWIS.

SIR,—I am desired to notify you of the following resolution which was passed at a recent meeting of this committee after discussion had taken place on the objects and constitution of the Medical Planning Commission: "This committee dissociates itself, in advance, from any findings of the Medical Planning Commission as at present constituted."

For your information I am also desired to say that in framing the above resolution this committee had in mind the following points: (1) No scheme for a medical service which does not secure the agreeable acceptance of the general practitioners is likely to succeed. (2) The general practitioners have the power to enforce their will if they are united in purpose, know what they want, and shout loudly enough for it. (3) The way to oppression and depletion is waiting to see what will happen and doing nothing. Some aggressive policy must be adopted and energetically proclaimed. (4) Our chief potential enemies are those of our own household, the principal menaces being: (*a*) the growing insufferable powers of medical officers of health; (*b*) the envious hungry glances of consultants towards the National Health Insurance Funds. (5) We must urge on the Minister of Health that the general powers of co-option which are conferred upon local authorities by the Local Government Act, 1929, and which enable them to appoint representatives of the medical profession on the Public Health Committees, should be made compulsory instead of permissive, as at present, and that the local Medical and Panel Committees should have the right to nominate such representatives.

To sum up, there are two cardinal principles for which we must fight: the maintenance of a living wage and freedom from interference; in other words, liberty.—I am, etc.,

G. GILBERT GENGE, Hon. Secretary,
April 10. Croydon Medical and Panel Committee.

Calcium Requirements

SIR,—Dr. I. Harris and Messrs. Ireland and James (January 11, p. 49) have made a careful review of calcium metabolism and the many unsolved problems connected therewith, and consider that there is no evidence of calcium deficiency in the country. I have lately perused a group of modern papers on the subject, mostly from the U.S.A., kindly supplied me by the librarian of the B.M.A., and find that though there is plenty to say, conclusions are as dogmatic as they are contradictory. This seems odd considering the amount of chalk and lime in the world, especially in Southern England, and that rickets has been called "the English disease," and that the triumph of vitamin D has been one of the marked advances in preventive treatment during the last two decades. The recent correspondence in the *B.M.J.* shows difference of opinion on the subject. Certainly the clinical evidence of calcium deficiency is difficult to come by notwithstanding Sir John Orr's statement that the vast majority of the population suffer from this insufficiency.

I can only approach the subject as a clinician: estimations of serum calcium are not possible for me, and my patients are comparatively few. I come from Thanet, near the North Downs, where the condition of our water pipes, unless the water is softened, is enough to prove that there is plenty of calcium if the body metabolism is ready to take it up. However, I have decamped to Devonshire for obvious (not calcium poisoning) reasons, and here there is very little calcium in the water. The amount in the North Down waters averages about 20 parts per 100,000. In the surface moorland water supply of North Devon it is only about 4, half of which is calcium carbonate. (The analyses I have looked up in Thresh, Beale, and Suckling's *Water Supplies*.)

In the area where I am now practising the water comes from Exmoor. The local hotels and lodgings are full of schools, mothers with small children, and delicate people, mostly from areas where calcium has been abundant. Now the symptoms of calcium deficiency are said to be: poor circulation, chilblains, depressed heart action; fatigue and nervous irritability, even tetany; catarrh and asthmatic symptoms; and, presumably, bone softening when the deficiency has gone on long enough to deplete the calcium reserve stored in the bone cells; dental caries, etc. All through this winter of wet rough weather severe long-lasting colds with bronchial catarrh and spasm have been very frequent among these people. There has been asthma, but not acute cases. Fatigue is obvious, perhaps to be accounted for by steep-hill walking, and also by "summer time" in winter. The children have lost weight in spite of cod-liver oil, etc.

I have seen no tetany, facial spasm, or bone softening. On the other hand, the local children are free from rickets; the dentists do not complain of overwork and their reports are satisfactory. I do not know what local physical signs to look for indicating parathyroid underaction or atrophy. Yet it seemed to me only wise to put the patients on wholesale lime-water, which they make for themselves at home with slaked lime and tap-water, and I am bound to say that on the whole it has been a great success. The colds and catarrh at all events have cleared up more quickly and the children are putting on weight. I should much like to know whether lime-water is an easily absorbable sort of calcium: if not, my observations are merely wishful-thinking. In some cases where I have thought the deficiency was urgent I have ordered calcium lactate for fourteen days, but I have not injected calcium gluconate, which I understand is the best method of introducing rapidly the missing element.

If I am correct in my treatment and observations the administration of calcium should be of value to those attending evacuated persons in Devonshire, especially the children.

I am not at all clear how calcium gets into vegetables, eggs, meat, etc., except through water. The original calcium here in North Devonshire has been metamorphosed into quartzite, etc.—I speak under correction—and is insoluble; there is none on Exmoor, where analysis shows that the water is very soft. On the other hand, how is it that the local children have no rickets? They do not eat much, if any, fish, unlike the children of the Hebridean islands with their herring diet; and their teeth are not in trouble to any marked extent. It may be that the body has an amazing capacity for taking up what it wants from a very meagre supply. Perhaps we over-regard the quantities in our dietaries and do not investigate sufficiently the more important problems of assimilation after digestion, thinking too much of our treatment and not enough of how Nature works, reacts, and defends herself.—I am, etc.,

Mortehoe, April 9. H. M. RAVEN.

Vitamin B_1 in Diphtheria

SIR,—Dr. Duncan Leys's criticism (March 29, p. 495) of our paper on vitamin B_1 in diphtheria (March 8, p. 359), the value of which can be assessed by the fact that he apparently has not taken the elementary precaution of carefully reading what he purports to criticize, affords us an opportunity of amplifying our previous statements. Naturally in an article presented for publication it is impossible to give very full particulars of the cases used in the experiment, and we trusted that this necessary pruning would not detract from the value of the article for the average intelligent reader.

We would first of all like to point out that Dr. Leys's statement that "none of their control cases appear to have had heart failure at all" is incorrect, since control case No. 2 is definitely mentioned by us as suffering from heart failure. Moreover, control case No. 10 developed a bradycardia on the twenty-fifth day, a fact which apparently had no significance for Dr. Leys, thus indicating that he is probably unaware of the importance of bradycardia in diphtheria. Secondly, his statements on tests Nos. 9 and 12 show that he has missed the whole point, as these cases were used to try out the curative effect rather than the prophylactic action of vitamin B_1; as there was nothing unusual in the rate of recovery there was nothing to remark about it. He states that we do not mention how long after treatment death occurred in test No. 7. The article shows that despite fourteen days' intensive treatment with the vitamin the patient died. As a matter of fact the patient developed gallop rhythm on the thirty-third day of the disease and died on the forty-first day.

We feel that Dr. Leys is trying to draw a red herring across our path by introducing other toxic states. May we remind him that our article was not on other toxic states but on the value of vitamin B_1 in diphtheria. Consequently there is no need for us to express our views on the value of the vitamin in these other conditions. We suggest that his own two cases

prove nothing: he does not even mention that they were cases of diphtheria: they could, from his letter, be due to other toxic conditions: the dosage of the vitamin is not given: he did not mention whether the vitamin was given before the appearance of the symptoms or after—if before the symptoms this shows that the complications appeared despite the vitamin B,: if after the appearance of symptoms, he is doing what he blames us for doing in some of our cases. There is no proof that the recoveries were not due to the other treatment: his numbers are too small and he had no controls.

It is a fact that if a therapeutic agent is really good it quickly and universally establishes itself, but despite the number of years that vitamin B, has been tried for complications of diphtheria there is no sign that this stage has been reached.—We are, etc.,

G. E. DONOVAN.
Health Department, Gorseinon, Swansea.
M. BANNISTER.
April 4. Royal Infirmary, Worcester.

Antiseptic Snuffs

SIR,—I read with much interest the article by Drs. M. E. Delafield, Edith Straker, and Prof. W. W. C. Topley (February 1, p. 145) on a proposed method of applying chemotherapy in nasal infections. The use of snuffs might be very useful but the formulae suggested are dangerous. I would refer the authors to a report by I. H. Erb, pathologist to the Hospital for Sick Children in Toronto, on lycopodium granulomata. It will be found in *Surgery, Gynecology and Obstetrics* 1935, **60**, 40. Lycopodium was used as a dusting powder for rubber gloves in that hospital until several cases of granulomata, at least one of which caused intestinal obstruction and another involved the maxillary antrum, were discovered. If the small amount of lycopodium spores derived from a surgeon's gloves could cause tumour formation in an antrum, what might be expected from a snuff each dose of which would carry many times the quantity accidentally applied in the operation? It would not be unreasonable to fear lycopodium granulomata in the lung.

Nor is magnesium carbonate much better. A series of cases cited by McCormick and Ramsay in the *Journal of the American Medical Association*, **116**, No. 9, March, 1941, showed serious reactions in the peritoneal cavity due to the adherence of talc (magnesium silicate) on surgeons' gloves. The idea of the use of snuffs is good and the bacteriological studies are convincing, but I respectfully suggest that the vehicle used fulfil the ancient admonition "primam nolle nocere."—I am, etc.,

Toronto, March 8. MALCOLM H. V. CAMERON.

Chemotherapy in Acute Otitis Media

SIR,—Although fully conscious of the honour of Mr. Lionel Colledge's interest (March 22, p. 455) in my article on chemotherapy and conservatism in acute suppurative otitis media (March 15, p. 399) and appreciative of his kindly if somewhat sombre warnings, I have more than a faint suspicion that he wrote with his tongue in his cheek. Were it not so, to call conscientious clinical investigation, however modest, "looking for trouble" would appear to be ungenerous, and reminds one of the execrations showered on the heads of a band of recalcitrant "trouble-seekers" who dared to do as Hunter advised Jenner, "Don't think—try"—to name only a few: Jenner, Lister, Simpson, and Mackenzie.

Perusal of the case-sheet reports and of the discussion makes it clear as to the offending organism, but absence of "streptococcal" in the conclusions may justify the reminder of the pneumococcus and the *Staphylococcus aureus*. With the recent great advance in our knowledge of the action of sulphanilamide derivatives the reminder is not material. It would be interesting to know whether it was Mr. Colledge's innate kindliness which led him to omit mention of the tubercle bacillus, which may be the primary cause of suppurative otitis and which definitely gives no response to this therapy.

As to bacteriological investigation, I agree that it should be done when and where possible, in the absence of or in confirmation of clinical findings, but that ideal is seldom attainable in a rural district miles from the nearest laboratory where the bacteriologist is not always available. Further, the time factor is all-important: just as with clinical diphtheria and cerebrospinal fever one dare not wait for isolation of the Klebs-Löffler bacillus and the meningococcus, so with acute suppurative otitis media the application of chemotherapy should not depend on the existence of a discharge from a drum ruptured either spontaneously or by incision.

I note that in the case quoted of the nurse with acute pneumococcal suppurative otitis media, "when it appeared as though a mastoid operation could scarcely be avoided," the condition responded satisfactorily to suitable chemotherapy without surgical measures. I could ask for no more complete confirmation of my thesis. With full laboratory facilities at his immediate disposal it surprises me that no typing of the pneumococcus was done with a view to more appropriate treatment—by chemotherapy appropriate to the special strain. In the second case quoted no mention is made as to close supervision, repeated examination, and the multiple safeguards upon which must depend the decision as to whether conservative treatment may be proceeded with safely. Any humiliating experience which I may meet should be no worse than that which the aural surgeon meets (but may not recognize as such) almost daily in his awkward necessity to carry out paracentesis in the same drum repeatedly or to follow one mastoidectomy with a second in the same ear.

The initial anxiety, which was associated with only the first two cases and which soon became one of pleasurable anticipation, was a natural and healthy reaction, and was no more than one would expect in Mr. Colledge if he were trying out a new technique, say, in paracentesis or any sculptural effort.

The trifling analogy is, I feel, entirely facetious, but I must confess to having exposed myself to the alluring if demoralizing influence of Ireland on a few short visits. As to my abandoning my so-called defiance of established indications for incision of the tympanic membrane, the complete non-existence of these is proved by a recent discussion on the "Causes of Failure in the Treatment of Acute Otitis Media" recorded in the Section of Otology (of which Mr. Colledge is president) in the *Proceedings of the Royal Society of Medicine* (February, 1941, p. 225).—I am, etc.,

Malvern Link, April 3. J. B. JESSIMAN, M.D.

Convulsions under Anaesthesia

SIR,—Dr. H. A. Logan (March 29, p. 480) makes no allusion to hyperpyrexia as a possible cause in his interesting account of a case of so-called ether convulsions. No mention is made of the temperature at the time of operation or for twelve hours after, and so presumably it was not taken, or not for some hours after the convulsions had ceased. In view of the prominence given to hyperpyrexia as a cause of ether convulsions in the discussions in these columns recently it seems a pity that this was not done. It was suggested, I believe by Mr. Hamilton Bailey, that such a measure is impracticable, and so it probably would be at the height of severe convulsions. However, if the temperature be taken as soon as the convulsions abate, or, if necessary, when the operation is concluded, the observation should still be significant as the body is unlikely to have cooled unduly.

A brief description of a case of anaesthetic convulsions which I observed recently may be of interest. Male aged 18, retrocaecal appendicitis. Temperature just before operation 102° F. No abnormality detected in the chest on routine examination. Gas, oxygen, and ether anaesthesia induced with Boyle's apparatus. Generalized symmetrical jerkings of the limbs and trunk started some ten minutes after the peritoneum was opened and when the patient was in full surgical anaesthesia. The theatre was very warm and the patient extensively covered with mackintoshes, towels, and blankets. Most of these were removed and as much of the patient exposed as was consistent with the maintenance of surgical asepsis. Evipan was prepared for injection, but as the surgeon was not grossly inconvenienced and was able to complete the operation rapidly it was not deemed necessary to give it.

At first the convulsions increased and were very violent for a minute or so, then gradually died down and finally ceased

some twenty minutes after their onset and after ether administration had been stopped and the excessive coverings removed. At the end of the operation the rectal temperature was 104.5° F., and it is probable that it was higher before measures were taken to "cool off" the patient. Further progress was uneventful.

It is not inconceivable that the high temperature in cases such as this might be the result rather than the cause of the convulsions. Other observers may perhaps have the opportunity of obtaining a temperature reading at the onset of the convulsions should their severity or the nature of the operation not prohibit this. Nevertheless, a reading of the temperature immediately the circumstances allow is of value in that it may help to show whether or not hyperpyrexia is always associated with these convulsions—an observation apparently not yet fully established.—I am, etc.,

South Shields, March 29. J. B. KINMONTH.

SIR,—Dr. Logan gives a very helpful account of a typical case of what is known as "ether convulsions." I have been interested in this condition for about twenty years. As Dr. Logan suggests, no real cause has yet been found, all manner of theories have been put forward, and almost every kind of treatment has been tried or recommended. There are, however, two points which emerge, and which I think are accepted as constant. First, the condition is nearly always connected with an attack of appendicitis in a young person. Secondly, the convulsions never come on before the anaesthetic has been in progress about twenty minutes.

The only satisfactory treatment of this condition is preventive. Side-track the ether as soon as induction is over and carry on with nitrous oxide and oxygen; whichever way we look at the condition, ether is toxic and nitrous oxide is not. I am somewhat suspicious of atropine, which seems to have been used in nearly all the cases reported; I use less as time goes on. A second convulsion, as Dr. Logan mentioned, is not very uncommon.—I am, etc.,

J. B. H. HOLROYD, M.R.C.S., L.R.C.P., D.A.,
March 29. Anaesthetist, Sheffield Royal Infirmary.

Cyclical Mucosal Ulceration

SIR,—I notice a rather unnecessarily sarcastic letter from Dr. M. H. Pappworth (April 12, p. 573) which did *not* reply to my letter and question. The point is that Dr. Pappworth has not answered my query, and one must assume that blood examinations were not made, and if they were made that an eosinophil count was not done. One must therefore assume that this publication was made without full investigation, which, I suggest, should be done before decrying friendly criticism.—I am, etc.,

Liverpool, April 14. J. BERNSTIEN.

Outbreak of Gastro-enteritis

SIR,—The outbreak of acute gastro-enteritis described by Lieut.-Colonel A. H. D. Smith and Captain D. J. Davies (April 12, p. 554) resembles a similar epidemic that occurred in this county in the same period of 1940. The characteristics were: (1) abruptness of onset; (2) rapidity with which successive members of families were affected; (3) the short course of the disease. Owing to this short duration and absence of unpleasant sequels the disease appeared to be unworthy of the title "gastric influenza." One was inclined to accept it as an act of God or of the King's enemies, and to await the next *crise de guerre*.—I am, etc.,

Sherborne, Dorset, April 13. J. WHITTINGDALE, F.R.C.S.

Nitrous Oxide for Dental Anaesthesia

SIR,—I have administered "straight N_2O" in some hundreds of dental cases during the last thirty-three years. I am driven to the conclusion that the war product differs considerably in its effects (and possibly in its method of production) from pre-war nitrous oxide. Briefly, I have noted a prolonged period necessary for induction, shallow and slow respiration, no stertor, an analgesia rather than an anaesthesia, and, worst of all, a marked delay in recovery often with syncopal symptoms. My technique has not varied; different apparatuses have been tried. Incidentally all apparatus has been checked by N_2O experts, who can offer no explanation. Other local doctors have experienced similar effects. It would be interesting to know whether any of your readers can account for the phenomena and suggest a remedy.—I am, etc.,

Petts Wood, April 4. B. RICHARDSON BILLINGS.

Albinism

SIR,—The cases of albinism reported by Dr. Edward Christianson under "Clinical Memoranda" (April 12, p. 556) will be of interest to all those who may concern themselves with the condition. This note is merely to suggest that the monograph on albinism by Pearson, Nettleship, and Usher from the Department of Applied Statistics, University College, London, should have been included in the bibliography. Therein will be found a number of cases described by me among dark-skinned natives of Africa; others are the subject of an article in *Biometrika*, 1913, **9**, Nos. 3 and 4, 333.—I am, etc.,

London, W.1, April 12. HUGH S. STANNUS.

Malignant Measles?

SIR,—With reference to Dr. Audrey Baker's letter (March 8, p. 380) dealing with a so-called case of malignant measles, I am in agreement with Dr. Geoffrey Goodwin's suggestion (March 22, p. 462) that this was a case of suprarenal haemorrhage, or, in full, a fulminating meningococcal septicaemia or Waterhouse-Friderichsen syndrome. A good description of a typical case is given by Dr. James F. Hughes in the *Journal* of September 14, 1940 (p. 353).

In a series of 300 cases of cerebrospinal fever admitted to the City Isolation Hospital, Cardiff, during 1940 I saw at least six cases of this nature. The outstanding features were the sudden onset, multiple petechiae and often ecchymoses, and a rapid pulse of low tension imperceptible in some cases, meningitic signs being absent and the cerebrospinal fluid clear in the early stages. In one patient the medical superintendent, Dr. Emrys Harris, was able to demonstrate numerous meningococci in a stained smear of the centrifuged deposit of a haemolysed specimen of blood.

There is profound toxaemia, and the haemorrhages into the suprarenal glands produce a very marked lowering effect on the blood pressure. Unless these are immediately combated with the administration of intravenous saline, together with sodium sulphapyridine soluble, and a suprarenal cortical extract, the prognosis is hopeless and death may occur within a few hours. Three patients, with an imperceptible pulse on admission to hospital, made a good recovery when treated on the lines indicated.—I am, etc.,

D. TREVOR THOMAS,
Swansea, April 1. Medical Officer of Health.

Crush Injuries

SIR,—Dr. S. W. Fisher, H.M. Medical Inspector of Mines (April 5, p. 534), asks for information on crushing injuries in mines. The Medical Research Council has also been seeking such information for many weeks but so far without success. Prof. H. A. Harris, however, hints in his letter (March 29, p. 491) that he is familiar with this type of injury in the coalfield. It would be helpful if he could document his experience for the sake of the common weal.

In the study of a syndrome such as this facts must be marshalled as carefully and completely, and in these days as rapidly, as possible. No useful purpose can be served by loose thought based on inaccurate and incomplete reading of the data followed by vague ideas about colostrum, crush injuries, and uric acid infarcts. On the other hand, any available *facts* concerning the clinical course of crushing injuries, or the development of renal failure in other types of injury, would be welcomed by those of us who are concerned with the provision of accurate and helpful information.—I am, etc.,

J. McMICHAEL,
Secretary to the M.R.C. Subcommittee on Traumatic Oedema.

British Postgraduate Medical School,
W.12, April 14.

Discission of Secondary Cataract

SIR,—Most ophthalmologists at some time or other have found difficulty in dealing with an after-cataract by means of a needle or a Ziegler's knife. The difficulty is in getting a *point d'appui*, and the fibrous membrane often simply moves in front of the instrument and is neither torn nor cut. Mydricaine is well known as a powerful mydriatic which does its work efficiently without raising the tension, but it is not sufficiently recognized that if 2% solution of cocain hyd. is instilled, and after an interval of three or four minutes a subconjunctival injection of 5 minims of No 2 mydricaine (Meorfields) is given, the discission can be done easily. The membrane becomes taut and the operation then presents little difficulty.—I am, etc.,

Wanstead, E.11, March 28. FRANCIS E. PRESTON

Pulmonary Oedema

SIR,—With reference to the annotation (March 22, p. 447) on Luisada's view of the reflex origin of acute pulmonary oedema, may I point out that the idea is by no means a new one. It was put forward, for example, by S. Wassermann in the *Ztschr. Arch. inn. Med.*, 1933. The earliest reference I can find is nearly thirty years old. In the *Lancet* of May 27, 1911, A. E. Carver gives an admirable and detailed description of two cases, and concludes that certain features observed in these cases "raise the question whether reflex vagus stimulation was not a factor in determining the onset of the attacks, and this element of nervous influence would account for the beneficial effects of treatment with morphine and chloroform, an experience which coincides with that of other observers in similar cases."—I am, etc.,

Paignton, March 31. ATHELSTANE HILL.

Medico-Legal

MURDER OR ACCIDENT?

The medico-legal evidence decided the question of guilt or innocence in a recent murder trial.* A woman had been found lying on her back in a bedroom. There had been a small blood-stained area on the carpet, and the body had various bruises and abrasions on the scalp, forehead, left eye, arms, and legs. Pressure had been applied to the tissues of the neck; some of the abrasions looked as though they might have been caused by finger nails. Her upper denture had two teeth broken recently, probably by a blow in an upward direction. Her husband was put on trial for her murder.

Prof. John Glaister gave the opinion that she had died of cardiac arrest during asphyxia. The character and distribution of certain of the injuries, particularly on the neck and arm, he considered to be inconsistent with self-infliction or accident. Although, if the injuries were taken individually, many of them were quite consistent with accident, yet if they were taken collectively he could not account for them in that way. Cross-examined, he said it was highly improbable that the bruises on her arms were caused by a clumsy attempt to lift her from the floor on which she was lying face downwards. She had taken a large quantity of alcohol not long before her death—nearly a whole bottle of whisky. She was probably very drunk, and if she fell might lie in a helpless and comatose condition. He agreed that in that condition she might be more liable to sudden cardiac collapse than if she had been sober. In answer to the judge, Lord Wark, he said he thought the pressure to the neck had been applied by human hands and could quite easily have been applied from the front with the right hand. Her condition, if she was unused to alcohol, would have tended to coma rather than to violence, but she might have needed restraint to prevent her from injuring herself or someone else. He agreed that her injuries might have been caused by being caught momentarily by a person who was endeavouring to restrain her or fend her off. Dr. A. P. Husband said that the fracture of the artificial teeth was consistent with violence, and he did not agree that they had been broken by striking the edge of a fender, for then they would have been more shattered. He also thought it highly improbable that they had been broken by a fall on a hard surface.

After the case for the Crown had been completed, Mr. G. R. Thomson, K.C., the Advocate-Depute, reduced the accusation to one of culpable homicide. Prof. Sydney Smith, giving evidence for the defence, developed the possibility that the woman might have died of alcohol. Regurgitation might have passed from the stomach to the windpipe and caused suffocation, which if death resulted would leave symptoms of asphyxia. The bruising could have been produced by a fall, and the damage to the denture could have been caused by the woman falling on her face. He had conceived the idea that she had been very drunk, unable to stand and falling about. If there had been another person in the house, that person was probably in the same condition. It was hardly possible that the wife would go on drinking by herself in the presence of the husband without being stopped, unless they were both drinking. She might have fallen on the fender so that her face and head, and possibly her heart, struck the kerb. Another thing to consider was that she had fallen forward on her face, and her husband might have tried to lift her by the shoulder and pull her up. Very considerable force was required to lift a limp body, and the scratches might have been caused by the attempt. The jury were absent only seven minutes before they brought in a unanimous verdict of Not Guilty.

* *Glasgow Herald*, Saturday, Feb. 22, 28.

The Services

HONORARY PHYSICIAN TO THE KING

Major-General J. A. Manifold, D.S.O., late R.A.M.C., has been appointed Honorary Physician to the King, vice Major-General J. W. L. Scott, C.B., D.S.O.

HONORARY SURGEONS TO THE KING

Major-General O. W. McSheehy, D.S.O., O.B.E., late R.A.M.C., and Colonel (temporary Brigadier) C. M. Finny, O.B.E., late R.A.M.C., have been appointed Honorary Surgeons to the King, vice Major-General F. D. G. Howell, C.B., D.S.O., M.C., and Colonel B. Biggar, respectively.

NAVAL MEDICAL COMPASSIONATE FUND

A meeting of the subscribers to the Naval Medical Compassionate Fund will be held on April 30, at 3.15 p.m., at the Medical Department of the Navy, 64, St. James's Street, S.W.1, to elect six directors of the Fund.

MENTION IN DISPATCHES

Surgeon Commander William Flynn, R.N., has been mentioned in dispatches for courage and devotion to duty when H.M.S. *Liverpool* was damaged during an attack by enemy torpedo-carrying aircraft.

CASUALTIES IN THE MEDICAL SERVICES

Colonel EDWARD MEREDYTH MIDDLETON, O.B.E., late R.A.M.C., was killed by enemy action in March, aged 60. He was the eldest son of the Rev. F. E. Middleton, late Rector of Hayesford, Norfolk, was born on October 10, 1880, and was educated at Toronto University, where he graduated M.B. in 1905, and at St. Thomas's Hospital, taking the M.R.C.S., L.R.C.P. in 1906. Entering the R.A.M.C. as lieutenant in 1907, he became colonel in 1935, and retired in 1937, when he joined the Reserve of Officers, in which he was serving as Assistant Director of Medical Services, Western Command, at the time of his death. He was on his way to a hospital when he was killed by a bomb. He served in the war of 1914-18 and was mentioned in dispatches in 1916.

ROYAL ARMY MEDICAL CORPS

Lieut. JOHN INGLEBY WILSON is posted as "Died" in an Army Casualty List published on April 7. He was 33 years of age and qualified M.R.C.S., L.R.C.P. in 1933. Before the war he was in practice at Knaresborough, Yorkshire.

Obituary

SIR GEORGE TURNER, K.B.E., C.B., F.R.C.S.,

Consulting Surgeon to St. George's Hospital

Sir George Turner, consulting surgeon to St. George's Hospital and, during the last war, consultant to the Navy with the rank of surgeon rear-admiral, died at Adelaide Crescent, Hove, on April 7, aged 85. His elder brother, the late Edward Beadon Turner, was for many years a leading figure in the central work of the British Medical Association, and the clock facing the inner courtyard of B.M.A. House commemorates his long service on the Council and chairmanship of the Representative Body. Both brothers were educated at Uppingham School during Edward Thring's headmastership, and went on to St. George's Hospital, and they were devoted sons of these two foundations; they were also fine athletes and played rugby football for England in the early international matches.

George Robertson Turner was born at Chigwell, Essex, in 1855; his ancestors were Devonshire people, and three of his uncles were doctors. Leaving Uppingham in 1872 he had a distinguished career at St. George's, winning an exhibition, a scholarship, and several prizes. He qualified in 1877, and after acting as house-surgeon and demonstrator of anatomy obtained the F.R.C.S. in 1880. He was then appointed surgical registrar at St. George's, and in 1887 assistant surgeon, by which time he had become a member of the visiting staff of the Seamen's Hospital at Greenwich, and he served the Dreadnought for eighteen years. In 1914, on the outbreak of war, he was posted temporary Surgeon Rear-Admiral, and in that capacity worked at the R.N. hospitals at Chatham and Plymouth, and as surgical consultant to the Admiralty. Part of his time when he was nominally at Chatham was occupied by a voyage to Malta to bring back some 700 wounded from Gallipoli. For his services in the war he was created C.B. in 1917 and K.B.E. two years later. He retired from the active staff of St. George's in 1918. In earlier years he had been examiner in anatomy for the English Royal Colleges and office-bearer in the Medical Society of London. He wrote articles for Heath's *Dictionary of Surgery* and for Latham and English's *System of Treatment*.



Sir George Turner had a warm heart and a breezy manner and prided himself on his outspokenness; he wrote, "I have dared to live my life without an over-regard for what people thought and said of me." He often remarked that the Turners were very conservative, and the word "democracy" made little appeal to him. His service with the Navy in wartime gave him great joy, for he loved the company of sailors. It was said by a shrewd judge of men, Sir Henry Burdett, with whom he had many passages of arms at the Dreadnought Hospital, "Turner knows what he wants and usually gets it." In 1931 he published his *Unorthodox Reminiscences*. This discursive book is a mine of good stories about men in various walks of life, particularly in the world of sport and racing, and the last chapter relates many interesting experiences that came his way when he wore naval uniform. Lady Turner died in 1926. Of their five children one son was killed in the last war, and one of the three daughters married Mr. G. A. Ewart, surgeon to St. George's. In retirement at Hove Sir George maintained his characteristic vigour of mind, and up to a short time ago was notably alert and active for a man of his advanced age.

W. MITCHELL SMITH, M.D.

By the death of William Mitchell Smith at the age of 68 on March 20 North Staffordshire mourns the loss of one of its foremost citizens and the crippled child a true and kindly friend.

A native of Aberdeenshire, Mitchell Smith graduated at Aberdeen University, for which he retained always a great pride and affection. He was never happier or more interesting and entertaining than when speaking of his beloved Scotland, of his boyhood days and his ever-cherished parents, of his life among the crofters, and of his old teachers and the profound influence they had on his future professional career, particularly, perhaps, Sir Alexander Ogston, whose portrait hung in his consulting rooms. Towards the end of last century he settled in the picturesque village of Tean, about ten miles from Stoke-on-Trent, where he soon built up a very large country practice. Alert, enterprising, and level-headed, he kept himself fully abreast of the progress in medicine and was always ready to adopt new methods if, after careful study, he considered that such treatment would prove of benefit to his patients, with whom he had great influence, and in their turn they looked upon him as a friend and wise counsellor.

Mitchell Smith was naturally a lover of children, and he was blessed with the power of obtaining the confidence, affection, and understanding of young people; he was keenly interested in those diseases common to children, and after he had firmly established his practice it was his custom to attend various children's clinics, particularly those of Still and Batten. In the early days of the last war he became associated with me in the care of crippled children at Hanchurch, a home originated by Millicent, Duchess of Sutherland, and Mr. Sydney Malkin, the father of a well-known orthopaedic surgeon, and the late Dean of Carlisle, who was then Rector of Stoke; the work increased to such an extent that further accommodation had to be found, and a small house was rented in the city for the treatment of out-patients. About this time I handed over to him, and later a further move became necessary as the amount of work was growing, and Smith decided to give up his practice and to devote his whole time to work among cripples—a very courageous step to a man who was then over 40 years of age. Eventually, with the help of many kind and interested friends, some old stables were converted into a Cripples' Home, which flourished, and still further extensions were added, until eventually an entirely new hospital was built, one of the foundation stones of which was laid by Sir Joseph Cooke, a native of North Staffordshire, and at that time Premier of Australia. In 1930 the Prince of Wales opened a new block, and in the following year a very fine open-air ward was opened by the Duchess of Portland.

In order to gain further and special knowledge of orthopaedic surgery, Smith became a resident at the old Baschurch Hospital, where he had the good fortune to come under the guidance of Dame Agnes Hunt, the late Sir Robert Jones, and the late Naughton Dunn, all of whom became his lifelong friends and who on many occasions conducted clinics at the hospital, when Sir Robert would bring with him distinguished orthopaedic surgeons from home and abroad. These clinics were greatly appreciated by the local members of the profession and were always well attended, and it was an inspiration to study Mitchell Smith on these occasions, overcome as he was with pride and joy when his results were praised and criticized by the great master Sir Robert Jones. The continued success of this hospital is due to the determination, keenness, and foresight of Smith, for it was by his own perseverance and unbounded energy that so wonderful a result followed upon such small and humble beginnings.

Mitchell Smith's one thought in life was the crippled child, their education while inmates of the hospital, and their training to become useful members of the community in the workshops attached to the hospital. He established also clinics for the treatment of cripples in various towns in North Staffordshire, which he visited regularly, and they proved most popular and successful; he was also closely associated with the children's clinics organized by the city and county authorities. Later, when the hospital decided to admit adult patients suffering from deformities, he showed the same enthusiasm and skill

In dealing with fractures Smith had unbounded patience and he was a master in the art of manipulation, reserving operative treatment until other methods had failed, though he was a sound surgeon, especially when dealing with deformities of the feet.

A brusque manner hid a very kindly heart and we, including numbers of patients, especially children, will ever retain happy memories of the man, with a real appreciation of the work he has performed, of a loyal friend who reached a high position by his determination, by dint of hard work and by his constant belief in the best and only the best, and finally he will ever be remembered as the man who first raised the treatment of crippledom in North Staffordshire to the high position it now occupies.

ERIC E. YOUNG

FREDERICK JOHN McCANN, M.D., F.R.C.S.

Dr. F. J. McCann, consulting surgeon to the Samaritan Free Hospital for Women, Marylebone Road, died on March 28. He was born in Edinburgh and educated at the University there, qualifying in medicine in 1888. After serving as demonstrator of anatomy at Edinburgh he came south, and held in turn the positions of resident medical officer to the Belgrave Hospital for Children and Queen Charlotte's Lying-in Hospital, house-surgeon to the Children's Hospital, Great Ormond Street, and senior house-surgeon to the West London Hospital. Dr. McCann built up a considerable reputation as a gynaecologist, and presently acquired a large consulting practice in Wimpole Street. In addition to his work at the Samaritan he was consulting gynaecologist to the West End Hospital for Diseases of the Nervous System and to a number of other hospitals in and around London.

He became a member of the Royal College of Physicians of London in 1892, took the M.D. of Edinburgh, with honours, in 1897, and the F.R.C.S.Eng. in 1901, and he was a Fellow of the British (now the Royal) College of Obstetricians and Gynaecologists from its foundation. He was a man who cultivated the international outlook. His medical education was completed in Berlin and Dresden, and he made close acquaintance with the medical schools of Paris, Leipzig, Vienna, Munich, Budapest, and Lisbon. When the fifteenth International Medical Congress was held at Lisbon in 1906 he was honorary president of the Section of Obstetrics and Gynaecology. He was also a member of the Société Internationale de Chirurgie and vice-president of the Ligue Internationale pour la Vie et la Famille. He was an excellent public speaker, with deliberation in his choice of words, and in the old days of the polyclinic in Chenies Street a highly popular lecturer there. He was also prominent in a number of medical societies, and had occupied the chair both of the Chelsea Clinical Society and of the West London Medico-Chirurgical Society. He was author of several works on his specialty, the chief of which was *The Treatment of Common Female Ailments*, which went through several editions; also *Cancer of the Womb: Symptoms, Diagnosis, Prognosis, and Treatment*; and he contributed the articles on gynaecology to several medical encyclopaedias.

In his dignified appearance and manner, his air of deference and old-world detachment, McCann recalled an earlier age in medicine, and given a wig and a gold-headed cane he would have fitted into the picture of eighteenth century physicians. But he was far from indifferent to modern trends and methods, and his kindly disposition evoked affection among a wide circle of friends and juniors.

JOHN SMYTH MACDONALD, F.R.S.

The death took place at Bridge of Allan, Stirlingshire, on March 29 of John Smyth Macdonald, F.R.S., Emeritus Professor of Physiology at Liverpool University.

Prof. Macdonald was born in Dublin in 1867, but his father's home was at Chester, and there, at King's School, he received his early education, going on to Emmanuel College, Cambridge, and to Liverpool University, where, in 1891, he was Holt Fellow in Physiology. It was a circumstance of great pride to him that, twenty-three years later, he should be called back to his old department as Holt Professor of Physiology. He was also, in 1899–1901, a research scholar of the British Medical Association. The other Association scholars of those same years were the future professors G. Elliot Smith and J. W. H. Eyre. After holding teaching posts in the physiological laboratories at Liverpool, Dundee (St. Andrews University), and Sheffield, he became in 1903 Professor of Physiology at Sheffield University, and this chair he held for eleven years. Then came what he regarded as the greatest honour of his life, his appointment to Liverpool, where he succeeded his great and revered master Sir Charles Sherrington, who had been Professor of Physiology there for almost two decades. His tenure of the chair was almost as long as Sherrington's, and on his retirement under the age limit in 1932 he was made professor emeritus.

Several contributions were made by Macdonald to the *Proceedings* of the Royal Society, of which he became a Fellow in 1917, and to the *Quarterly Journal of Experimental Physiology*. At the Annual Meeting of the British Medical Association at Sheffield in 1908 he was honorary secretary of the Section of Physiology, and when the Association met in Liverpool in 1912 he was president of the same Section. His short presidential address on that occasion was chiefly devoted to demonstrating an antagonism between serum and blood corpuscles. He was an original thinker with an unusual way of putting the facts of physiology before his students. For example, thirty years ago he was likening the muscles to energy pumps which, by their proprioceptive mechanism, retransmitted impulses to the central nervous system. He also suggested that the role of oxygen in the central nervous system might be that of a scavenger. He rejected the opinion which regarded the nerve fibre as an insulated path and the cell body as a battery: in its place he held the view that the nerve might be regarded as equivalent to a series of batteries.

In his later years Prof. Macdonald had lived in quiet retirement in Lincolnshire and in Scotland. He had married a Scottish lady, Miss Stewart of Stornoway, who survives him.

DR. DAVID DIAMOND, M.R.C.P., D.P.H., deputy medical officer of health for the city of Kingston-upon-Hull, has been killed by enemy action. He was born in London and received his early education in South Africa and his medical education in London at St. Bartholomew's Hospital, qualifying L.R.C.P., M.R.C.S. in 1923, and, having chosen public health as his career, he proceeded to the D.P.H. in 1931. After gaining experience in Holborn and the Port of London he was appointed assistant medical officer of health under the Hull and Goole Port Health Authority in 1931. In 1934 he became senior assistant medical officer of health in charge of the Tuberculosis Department, which post he held until his appointment as deputy medical officer of health for the city of Hull on January 1, 1939. He obtained the M.R.C.P. in 1937. The M.O.H. for Hull sends the following tribute: "We, who were privileged to be his colleagues in the Hull Health Department, mourn the loss of an able colleague and a brave man. The death while on A.R.P. duty of Dr. David Diamond came as a great shock to us all. He was appointed to the staff of the department in 1931. His ability secured for him rapid promotion and he became deputy medical officer of health. His wide knowledge of men and affairs stood him in good stead in his approach to the many and varied public health problems of this City and Port. Since the war he had been closely associated with the organization and administration of the A.R.P. casualty services, and the end came while he was engaged in controlling the operations of the service in the creation of which he had played so important a part. He will long be remembered as an able physician, untiring in his efforts to ameliorate the lot of his less fortunate citizens, and as a promising public health administrator. Our deepest sympathy is extended to his widow and two young daughters in their sad bereavement." Dr. Diamond joined the British

Medical Association twelve years ago, and at the time of his death was a member of the Council of the East Yorkshire Branch.

Dr. JOHN TAYLOR died at Dunfermline House, Elgin, after a few days' illness, on March 31. He had been a member of the British Medical Association for nearly fifty years and was a past-president of the Northern Counties of Scotland Branch. His professional training was at the University of Aberdeen and the School of the Royal College of Surgeons of Edinburgh. He graduated M.B., C.M.Aberd. in 1886 and proceeded M.D. in 1891. After qualifying Dr. Taylor returned to his native town, Elgin, and built up a large general practice. He held many local appointments in and around Elgin and was consulting surgeon to the Fleming Hospital at Aberlour. During the greater part of his career he had close associations with Dr. Gray's Hospital, of which he was for many years visiting medical officer. On retiring from the active staff of the hospital in 1938 the managers placed on record their high appreciation of the services he had given to that institution, and made him an honorary consulting surgeon. He was also a Justice of the Peace for Morayshire.

Dr. THOMAS HARTIGAN, who died on April 2, studied medicine in Dublin and Newcastle and graduated M.B., B.S. of Durham University in 1893, proceeding M.D. in 1907. He practised in London for many years, at Gloucester Terrace, W. "F. N. R." writes: The news of Dr. Hartigan's death will be received with very real grief by his friends, colleagues, and patients. With his quiet reserve, he was not an easy man to get to know, but behind this lay a fund of endearing qualities, not the least of which was his dry and never-failing sense of humour. He was the epitome of what a doctor ought to be: the kind physician with a power of imparting confidence and a sense of trust, given only to those possessed of real ability and a great human understanding. Neither rash nor too conservative in outlook in his dealings with patients, he held to the single objective of what was the very best which could be done for each one; added to this was a real kindness of heart, such as is rarely met. I saw him quite recently, and his preparations for the inevitable had been made with that calm consideration for others so characteristic of all his utterances and actions. Those of us who were honoured by Thomas Hartigan's friendship will count ourselves fortunate, grieve at his departure, and look back upon his example.

The following well-known foreign medical men have died: Dr. JAN SCHOEMAKER of The Hague, twice president of the Dutch Medical Association and President in 1935 of the International Surgical Congress at Cairo, aged 69; and Dr. CHARLES LAUBRY, professor of cardiology in the Paris faculty of medicine, aged 69. Both were Honorary Fellows of the Royal Society of Medicine.

Universities and Colleges

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a meeting of the Royal College of Physicians of London on April 7 Sir Charles Wilson was elected President.

The Licence of the College was granted to Mohamed Abdul Hafeez of Osmania University and West London Hospital.

Diplomas in Ophthalmic Medicine and Surgery were granted, jointly with the Royal College of Surgeons of England, to the three candidates whose names were printed in the *Journal* of March 22 (p. 465); as were the names of the nineteen successful candidates for the Diploma in Tropical Medicine and Hygiene.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—E. W. Crews, C. Farès, S. Wetherell.
MEDICINE.—M. M. El Garrahy.
FORENSIC MEDICINE.—M. M. El Garrahy.
MIDWIFERY.—P. L. McN. Armstrong.

The diploma of the Society has been granted to E. M. Crews, M. M. El Garrahy, and S. Wetherell.

Medical Notes in Parliament

Mr. Ernest Brown on April 10 received a deputation on the Medicine Stamp Duty. The members of the deputation were Captain Elliston, Sir Francis Fremantle, Mr. Keeling, Sir Robert Bird, and Lord Wolmer. All were in favour of the retention of the tax. Mr. Brown is to bring in a Bill proposing its abolition. A further deputation is projected to Sir Kingsley Wood.

Insurance Practice of Casualty Service Doctors

Mr. ERNEST BROWN, on April 1, told Mr. Groves that an insurance practitioner was required to make all necessary arrangements for securing the treatment of his insured patients where prevented from giving such treatment himself by urgency of other professional duties or other reasonable cause. If neither the practitioner nor his deputy was available any other insurance practitioner could be required to give it. A fee was payable to the last-mentioned practitioner, subject to the claim being passed by the panel committee. The fee was recoverable from the patient's own practitioner unless the panel committee was satisfied that there was reasonable cause for not summoning him.

In reply to another question by Mr. Groves, the Minister said that in a number of areas a rota of doctors for duty at first-aid posts, medical aid posts in public shelters, and food and rest centres had been arranged. Similar arrangements for providing medical attention for insured persons was a matter for agreement between the panel committee and insurance committee of each area concerned, and detailed information was not available.

Registration of Alien Doctors

Mr. BROWN explained on April 2 that the Medical Practitioners (Temporary Registration) Order, 1941, and the Defence Regulation under which it was made provided for the registration of doctors of certain alien nationalities not possessing British medical qualifications, if they were employed or had been selected for employment in an approved hospital or other institution or service not involving domiciliary practice. He said it was not intended to fix a maximum number of doctors who should have the benefit of the Order. Up to date twenty-eight doctors of enemy nationality had been selected for employment in accordance with the Order.

Accommodation for Fracture Treatment

Answering Mr. Magnay, Mr. BROWN on April 3 said he proposed to provide for fracture cases occurring among industrial workers so far as possible under the Emergency Hospital Scheme. The hospital accommodation available included a large number of beds in hospitals and orthopaedic centres which were, or would shortly be, specially equipped for dealing with fractures and for giving the most modern forms of physical therapy and occupational therapy. For war casualties, both military and civil, these facilities were welded together into a comprehensive organization, supervised by the consultants in orthopaedic surgery employed by the Ministry of Health and the Department of Health for Scotland, so that the patients could be sent to the hospitals best suited for dealing with their injuries and, if necessary, transferred from one to another. The treatment of casualties was and must remain the primary purpose of the Emergency Hospital Scheme, but, to secure the fullest possible use of the organization, the Government had decided that in so far as there were vacant beds not likely to be required for the treatment of war casualties, they should be made available for fracture cases occurring among other classes of the civil population whose early return to work was of special importance to the national cause. These included the injury was sustained in the course of their duties or by manual workers engaged in munition work (including building and ship repairing), building and civil engineering, mining, agriculture, fishing, public utility undertakings, shipping and transport, would be eligible for treatment in these

centres under the emergency scheme, in so far as facilities are available. Whole-time paid civil defence personnel would also be included in these arrangements. The patient would be expected to contribute through any contributory association to which he belonged or, if not a member of such an association, to pay such amount as he could reasonably afford towards the cost of his treatment, according to ordinary hospital practice.

Medicine Stamp Duties

In introducing the Budget on April 7 Sir KINGSLEY WOOD said that when the Finance Bill of July was being discussed the question was raised of the application of the purchase tax to medicines subject to the medicine stamp duty. It was pointed out that this involved a tax upon a tax, and comments were made on the medicine stamp duties themselves which, as his predecessor had told the House of Commons in 1939, had become administratively unworkable, and which it was highly desirable to repeal on that ground. The various interests concerned with the duties had come together and reached an agreement. He had consulted with the Minister of Health and, as a result, was in a position to announce that the Medicine Stamp Duties would be repealed. The Minister of Health would as soon as possible introduce legislation the object of which would be to maintain a fair balance between the interests of the pharmacists and of other vendors. The repeal would come into operation from September 2, so as to allow reasonable time for disposal of stamped stocks. We should part, therefore, with the Act of 1802 and other Acts in this matter, which, in process of time, had become a museum-piece of administrative complexity. The cost of this repeal would be £640,000 this year and £840,000 in a full year.

During the discussion on the Budget in the House of Commons on April 9 Captain ELLISTON said that the proposal to abolish the medicine stamp duties would mean the surrender of approximately £800,000 a year in revenue. He urged the Chancellor of the Exchequer to think again before he surrendered this sum which a great industry could well afford to pay. The Select Committee, which reported in 1936, while recommending that the duties should be simplified to remove anomalies, difficulties, and irregularities of administration, was of opinion that the trade was suitable for taxation and that a further large range of preparations should be liable. The Committee estimated that the turnover of the patent medicine manufacturers could be put at £20,000,000 a year, and that the taxation they proposed would yield not less than £3,300,000 a year. From the point of view of public health, the House of Commons was being asked to agree to proposals to remove a tax which, to some extent, acted as a check on extravagant indulgence in the habit of self-medication. If the duties were abolished it was notorious that there would be a marked increase in drug-taking and self-medication. These patent medicines, which could not now be sold under about 1s. 3d., would be put on the market in 6d. and 3d. packets. They would be obtainable from automatic machines and would cover the counters of the chain stores. They would be available in every grocer's shop. If the Chancellor of the Exchequer was determined to wipe out the Stamp Duty the House was entitled, before he did so, to have a Bill which, he understood, the vendors were ready to accept, which would control the advertisement of medicines and secure some measure of protection for the public.

Sir KINGSLEY WOOD said he would take into account what Captain Elliston had said. The proposals he had made in the Budget, if they were to be effective, must be contained in the Finance Bill, and he hoped that, as the interests concerned were in agreement, in any representations made to him it would be possible to maintain that agreement. Further debate on the Budget was adjourned until after Easter.

Decisions of Medical Boards

On April 8 SIR ERNEST GRAHAM-LITTLE asked the Secretary of State for War whether he was aware that dissatisfaction existed regarding the methods at present in force by which the Army authorities overruled the grading of recruits by the civilian medical boards; and whether he was aware that while two medical officers at least were required to reduce a recruit's category, one medical officer, unaided by a specialist or colleague, could raise that category. Captain MARGESSON said that instructions for the medical classification of soldiers were in process of amendment, the effect of which would be that the medical category of a recruit would not be altered during his first month's service unless the circumstances were exceptional. In regard to reclassification after that period, Sir Ernest Graham-Little would appreciate that, apart from possible changes in a man's physical fitness during the time that might elapse between examination by a civil medical board and calling-up, disability might only come to light during training. On the other hand, the conditions of Army life might improve the physcial fitness of a recruit to such an extent as to justify transfer to a higher medical category. Specialist advice was obtained by the Army medical officer where necessary.

Capitation Fee

On April 8 Mr. GROVES asked the Minister of Health whether further consideration had been given to the question of increasing the capitation fee payable to insurance practitioners, or granting them a *per capita* war bonus, having regard to the increased cost of living and the increased practice expenses, as well as to the fact that the fee was fixed on an insurance basis which had entirely changed by reason of so many of the healthiest insured persons being withdrawn from civil life and serving with the armed Forces. Mr. ERNEST BROWN replied in the affirmative. He said that the question had received full consideration. He had come to the conclusion that under present conditions he would not be justified in proposing an increase in the capitation fee.

Examination of Recruits to A.T.S.

Mr LAW informed Miss Ward, on April 8, that eighty women held commissioned rank in the R.A.M.C. The Ministry of Labour was responsible for the medical examination of men called up for the three Services under the National Service (Armed Forces) Acts as part of its general responsibility for the calling-up arrangements. As that Ministry was not responsible for the medical examination of recruits for the Auxiliary Territorial Service, this examination was normally carried out by R.A.M.C. women doctors, but, if a R.A.M.C. doctor was not available, a woman civilian medical practitioner was employed. He saw no objection to this arrangement, which worked well in practice and was calculated to secure the most economical use of medical personnel.

War Casualties

The approximate number of United Kingdom casualties from the beginning of the war to April 9 is:

Civilians

	Killed		*Injured and Detained in Hospital*
Men	13,712	Men	21,811
Women	12,112	Women	15,893
Children under 16	3,644	Children under 16	3,193
Unclassified	388		
Total	29,856	Total	40,897

Armed Forces

Killed and Missing	Wounded
37,607	25,895

Doctors Hard Hit by the War

Mr. GROVES inquired on April 10 what consideration had been given to the fact that doctors in danger zones suffered serious financial losses and experienced great difficulty in making a livelihood, and yet doctors in safe zones, by reason of evacuation, profited at the expense of the others. He asked whether some reasonable adjustment could be made so as to compensate the less fortunate doctors. Mr. BROWN replied that measures to meet the situation described, which was not peculiar to the medical profession, were primarily a matter for the profession itself rather than for the Government. The

Central Medical War Committee had acted so far as possible as a clearing house for the transference of doctors from evacuation to reception areas. The official arrangements for wartime medical services had also taken account of the special position of doctors in evacuation areas. For example, a number of those in coastal towns had been appointed to salaried posts in the Emergency Medical Service in their own towns or elsewhere. The number selected for commissions in the medical branches of the Forces was proportionately larger in the evacuation areas than elsewhere.

Medical Man-power

In reply to Sir FRANCIS FREMANTLE on April 10 Mr. BROWN said he had not yet established an organization for settlement of priority, as between the demands of the several Forces and Departments, for medical men, as recommended in January last by the Robinson Committee and urged by the Central Medical War Committee as essential to its work. The Service Ministers and the Secretary of State for Scotland and he awaited the results of the measures taken to carry out the other recommendations of the Robinson Committee. In the meantime they had not thought it necessary to set up any special priority organization. The matter would be kept under consideration.

Conditions at Prisoner-of-War Camp in Germany

Prof. SAVORY asked the Secretary of State for War whether he was aware that, according to the latest information, medical officers detained in camp Stalag XXA, in spite of the Geneva Convention, were suffering from having only one blanket in a temperature of 20° below zero; whether he would make representations to the German authorities through the protecting Power to provide extra blankets and also the necessary remedies for the destruction of the lice, described as ubiquitous; and, in view of the fact that while there was a cobbler's shop there was no leather and it was necessary for these officers to have repairs done to their boots, he would endeavour to arrange that leather should be provided.

Captain MARGESSON: Representations have been made to the German Government on both the first two points referred to in the question. There was a general shortage of leather in Germany, and in some cases wooden soles were being used as a substitute. The number of pairs of boots sent to the International Red Cross Committee for distribution to British prisoners of war was 97,125, and there had recently been a considerable improvement in the state of footwear in the camps. A further consignment of boots was at present on its way from this country.

Anti-gas Ointment.—Asked on April 3 about the supply of ointment for dealing with the effects of blister gases, Mr. HERBERT MORRISON said that bleach ointment had been on sale for some time. Anti-gas ointment No. 2, which was better, was now procurable through any chemist. To meet the needs of members of the public who did not provide themselves with a supply of ointment, arrangements had been made for bleach cream, which could not readily be carried in small containers, to be available in the event of emergency at chemists' shops. He would consider whether it was possible to supply a small pocket outfit to wardens and other civil defence workers.

Calcium in Wholemeal.—Mr. LEVY asked on April 9 whether the Ministry of Food was aware that the phytic acid in wholemeal used up all the calcium contained in it, and whether they would consider the addition of calcium to the Ministry's wholemeal loaf to protect consumers against rickets. Major LLOYD GEORGE did not accept everything in Mr. Levy's question, but said that his suggestion was under active consideration.

Cost of Diphtheria Immunization.—Answering Mr. Creech Jones, Mr. BROWN said on April 10 that the cost of immunization fell under the two main heads of payment for medical services and cost of prophylactic material. As the work might be carried out in part by local authorities' own salaried medical staff and in part by general practitioners under varying financial arrangements with local authorities, it was not possible to estimate expenditure under this head. The cost of supplying prophylactic was estimated at about £7,000 per million children, or rather more than 1½d. per child.

Blood Donors.—Local appeals for blood donors have been organized where necessary by the blood transfusion officers serving in the Emergency Medical Service in each region. Mr. Brown is advised that the number coming forward as a result is adequate except in a few isolated instances. In these cases help is obtainable from a neighbouring town. Mr. BROWN said on April 10 that the matter could safely be left in the hands of the regional blood transfusion officers, and that no special appeal by him was necessary.

Fees Paid to Medical Boards.—On April 8 Mr. BEVIN told Mr. Groves that the total sum paid in fees to members of recruiting medical boards in the twenty-one months up to February 28 last was about £1,199,350. He could not state, without making a detailed inquiry, the maximum and minimum amounts paid to individual doctors or the total number of doctors who at some time during the period participated in the work. The number of doctors at present on the panels of medical boards was 3,724.

Medical News

Dr. O. R. Tisdall will read a paper on "The General Practitioner and Scientific Thought" before the Royal Society of Arts (John Adam Street, Adelphi, W.C.) on Wednesday, April 30, at 2.30 p.m. Viscount Dawson of Penn will preside.

A meeting of the Medico-Legal Society will be held at 26, Portland Place, W., on Thursday, April 24, at 5 p.m., when J. C. M. Matheson will read a paper on "Infanticide."

The seventeenth annual meeting of the American Association of the History of Medicine will be held at Atlantic on May 4 to 6 under the presidency of Dr. Esmond R. L Henry Phipps Institute, Philadelphia.

The Duke of Kent, president of King Edward's Hos Fund for London, in a broadcast talk on Easter Monda the work of the hospitals since the war started, spoke o damage suffered from enemy bombing. "The hospitals; he kept going and going strong, because there were brave devoted men and women who were determined to overc any difficulties.

At a dinner held in a Scottish town, attended by se medical officers of the Polish Army, the Director-Genera the Military Medical Service of the Republic of Poland sented to Colonel A. Irvine-Fortescue, D.S.O., M.B., illuminated diploma and enamelled cross of the Polish r tary distinction known as the Odznaka Sluzby Zdrovia (ba of medical service). In making the presentation the Po D.-G. said that the whole Polish Medical Service in Bri knew Colonel Irvine-Fortescue well, and paid tribute to work in helping the organization of the Service.

The Manchester Jewish Hospital, which was forced to s pend its work for two months owing to damage to part of buildings, is once again admitting patients, and half of beds in the hospital are already in use. It is hoped to m up the full complement of beds in the next few weeks.

At a recent Court of Governors of Bethlem Royal Hospi it was announced that Queen Mary had consented to nominated president of the hospital. The foundation of t hospital dates from 1247 in the reign of Henry III, and charter, which embraces its sister hospital, St. Bartholomew was granted by Henry VIII in 1547. The revenues are no devoted to the maintenance of the hospital at Monks Orchar near Beckenham, Kent, opened by Queen Mary in July, 19 where patients suffering from nervous and mental disorde are received and treated on the most modern principles, ar where a centre of active research has been established throug the generosity of its former president, the late Lord Wakefie

The late Mr. Herbert Tilley, F.R.C.S., who left £101,2 (net personalty £97,485) bequeathed £800 to the Royal Ear and Throat Hospital, University College, for the upkeep of the Herbert Tilley Museum, and £200 upon trust for an annual lecture, and £1,000 to the Royal Medical Benevolent Fund.

Prof. Henry Sigerist of Johns Hopkins University and Dr. Esmond R. Long, president of the American Association of the History of Medicine, have been elected honorary members of the History of Medicine Athenaeum of Buenos Aires.

The scientific report of the Royal College of Surgeons of England for the year 1939–40, presented by the Conservator, Prof. John Beattie, indicates briefly part of the work carried out by the museum department and by the research laboratories between October 1, 1939, and September 30, 1940. The pathological curator and various members of the technical staffs remain absent on military or national service. A sustained inflow of specimens during the year is recorded with satisfaction. Though the museum is now closed, it is hoped that Fellows, Members, and other friends may continue to bear in mind its needs, even though specimens presented now cannot be critically examined or mounted until the end of the war.

One hundred girls are to be formed into a mosquito squad in Queensland for fighting mosquitoes in military camps. They will be specially trained in hygiene and other subjects

Canada is setting up a "blood bank" to provide transfusions for 20,000 military and civil casualties.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

One hundred and sixty-eight fewer cases of measles were reported than in the preceding week. But, despite the general downward trend, increases have been notified from some areas. The following figures show the extent of the increase over those for the preceding week—Nottingham, Worksop R.D. 67; Staffordshire, Brierley Hill U.D. 67 and Rowley Regis M.B. 53; Warwickshire, Birmingham C.B. 160; York. West Riding, Leeds C.B. 54 and Hemsworth U.D. and R.D. with 22 and 20.

Diphtheria showed 31 notifications in excess of the previous week. A fall of 16 in the notifications of scarlet fever was recorded; but in Staffordshire the returns rose from 41 to 77, and in Lancashire from 173 to 196. Of the 24 cases of enteric fever notified in England and Wales 12 were returned from Northamptonshire (10 from Brixworth R.D.). There was no change in the total notifications of cerebrospinal fever; the county of Chester showed an increase of 10, and London and Swansea both returned 7 more cases than in the preceding week. The number of cases of dysentery decreased by 18, although fresh outbreaks were reported from several areas, the largest being Essex, Witham U.D. 9; Gloucestershire, Bristol C.B. 6; Yorks, West Riding, Wortley R.D. 12.

Whooping-cough

There were 4,319 notifications for the week ending March 22, a rise of 981 on the preceding week. This is the largest figure recorded since the returns of whooping-cough were first published in November, 1939. The rise was fairly general throughout the country, the largest increases being reported from Lancashire, Leicestershire, and Yorks, West Riding, with, respectively, 75, 57, and 93 more cases than in the previous week. The eastern counties have a low incidence—Suffolk 23, Norfolk 14, and Lincoln 14—and very small numbers are recorded from the south-western counties of Dorset 10, and Cornwall 9.

Returns of the Registrar-General for Scotland

The publication of the returns for the fourth quarter of 1940 include a preliminary return for the year. The birth rate of 17.1 per 1,000 for the year was the lowest ever recorded in Scotland. The death rate was high, 14.9 per 1,000, being 1.7 above the average for 1935–9. Infant mortality was 78 per 1,000 live births. This was a higher value than that recorded in the two preceding years, but with two exceptions lower than for all years before 1938. Deaths from scarlet fever 35, and whooping-cough 197, were the lowest ever recorded in Scotland for these diseases. The deaths from measles 262, diphtheria 676, and influenza 1,801 were respectively 25, 246, and 577 above the average for 1935–9. Deaths from cerebrospinal fever numbered 482, against 61 in the preceding year, and was the largest number registered as due to this cause since 1907.

No. 12

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 22.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	(b)	(c)	(d)	(e)	1940 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	330	26	80	2	19	475	52	106	2	9
Deaths		3	4				6	11		
Diphtheria	1,664	60	278	24	28	678	31	245	50	32
Deaths	44	4	6	—	—	20	1	5	—	3
Dysentery	125	25	36		—	28	2	63		—
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	2	—	1		—	4	—	1		—
Deaths		—	—				—	1		
Enteric (typhoid and paratyphoid) fever	24	1	82	2	2	29	3	159	2	—
Deaths	—	—	—	—	—	2	1	1	—	—
Erysipelas			48	6	—			52	3	1
Deaths		1	—				—	—		
Infective enteritis or diarrhoea under 2 years	38	2	11	4	7	35	2	11	12	7
Deaths										
Measles	14,888	249	168		19	6,111	51	53		180
Deaths	21	—	1	1	—	7	—	1	1	3
Ophthalmia neonatorum	83	2	24		—	85	6	25		2
Deaths										
Pneumonia, influenzal*	1,177	37	29	6	6	1,296	68	26	11	9
Deaths (from influenza)	116	9	8	7	1	221	16	15	7	11
Pneumonia, primary			544	14				255	7	
Deaths		—		13	14		69		21	28
Polio-encephalitis, acute	—	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	8	—	2	1	—	4	—	2	—	—
Deaths		—	—				—	—		
Puerperal fever	—	—	19	3	—	1	1	13	2	—
Deaths		—					—			
Puerperal pyrexia	24	1	27		3	169	7	24		—
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,205	55	162	23	27	770	29	129	33	55
Deaths	2	—	—	—	—	2	—	1	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	1	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	4,319	64	847		19	443	14	17		32
Deaths	56	2	22	2	2	7	—	2	—	1
Deaths (0–1 year)	478	30	165	24	23	452	55	75	43	45
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	6,733	944	843	235	242	5,153	929	709	214	194
Annual death rate (per 1,000 persons living)			18.4	15.6	21.2			15.1	14.3	17.0
Live births	5,322	396	991	321	249	5,526	840	783	271	201
Annual rate per 1,000 persons living			20.0	21.3	21.8			15.8	18.1	17.7
Stillbirths	228	16	45			252	29	35		
Rate per 1,000 total births (including stillborn)			43					45		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Income Tax

Fall in Partnership Income

"X. Y. Z." carry on a practice in a defence evacuation zone and the receipts have suffered accordingly. The assessments have been on the cash basis. How should the income from the partnership be calculated?

*** It should be borne in mind (*a*) that the special relief to falling incomes does not affect liability to assessment on the previous year's basis, though it gives relief from the severity of the tax so assessed; (*b*) that the claim to relief must be made by an individual, in respect of his total earned income, and not by the firm as such. "X. Y. Z." should therefore compute the adjusted profit of the firm for 1940–1 and the division between the partners as if for the 1941–2 assessment. Each partner should then make an individual claim to relief for 1940–1 (assuming that the 20% reduction condition is complied with) to the local inspector of taxes, who will arrange accordingly. The fact that the firm's accounts are on the cash basis is not likely to create difficulty; actually it would tend to slow down the effect of the reduction in earnings.

Travelling Expenses—Appointment Books and Examination Fees

"J. F." holds an appointment as physician to an infirmary and continues to act as assistant physician to another infirmary. It was one of the conditions of the new appointment that he should be allowed to continue the duties of the former one. Can he claim travelling expenses? Also, can he claim expenses incurred on books, etc., in connexion with his study for a further degree?

*** It was held in a very old case that the expense of travelling from a residence to the place where the duties of an office are performed is not allowable. If the duties are carried on in more than one place (e.g., those of a Member of Parliament) the cost of travel from one to the other is allowable. Consequently, if the condition of carrying on his former duties were laid upon him by the authority from whom his new office is derived, "J. F." could by analogy, in our opinion, claim some allowance But we gather that that is not quite in accordance with the facts. The expenditure on books, examination fees, etc., represents capital outlay and is not allowable.

Part of Premises Let

"N." has let two sections of his house to tenants, in substantially an unfurnished condition. How does this affect his liability?

*** In the first place assuming that he still uses the same rooms as before for professional purposes (and to the same relative extent) the lettings will not affect the deduction to be made in calculating his professional earnings He is, however, apparently liable to account for tax on the additional monetary advantage he is deriving from the letting. The precise amount is a matter of calculation, the basis of which is that he is liable to assessment, as for unearned income, at a sum representing the excess of what the net Schedule A assessment would have been on the facts as they now stand over the actual assessment of £122. Probably the best course for "N." to follow is to send a statement of the facts to the local inspector of taxes and await the result.

LETTERS, NOTES, ETC.

Complications after Chemotherapy in Pneumonia

Dr. J. GRIMSON (London, N.3) writes: Since the introduction of sulphapyridine in the treatment of pneumonia many physicians, both in specialist and general practice, have noted the relative increase in the incidence of empyema and delayed resolution in cases treated by this drug from the immediate onset of symptoms. Bearing this in mind, I have recently delayed giving the drug until within forty-eight hours of the expected time of cr In every case so treated a typical crisis has occurred and th have not been any complications. I quite realize that a such cases do not prove very much, but I think these observati are worth recording.

Treatment of Scabies

Dr. W. F. COOPER (London, S.W.20) writes: Dr. H. M. Bernca (January 25, p. 135) describes the use of sulphur. *Scabies see* to be becoming extremely prevalent, apparently due to shell and carried from one person to another. Anyhow, the treatm is very important at the present time. I can confirm I Berncastle's experiences, as I have had sufficient personal expe ence. There is evidently a very important difference betwe plain sulphur and the ointment. Plain sulphur, flowers ground, oxidizes to the dioxide in moist air, but when ea particle is surrounded with grease oxidation is prevent Actually one can smell the sulphur dioxide when the powder exposed; and that is one of the finest *insecticides.* Sulphur the greatest and by far the most common of all insecticides. is used for animals in tremendous quantities. It is used f trees, plants, and so on—also in great quantities. If the bo and clothes are dusted with the powder, finely ground, the cu *is simple* and certain, at least in my experience. It is just efficacious against lice and bed-bugs. When I get an infecti myself I dust all clothes, blankets, bedding, etc., with it. F mattresses I use coir, which I dust freely, and place betwe folded sheet or rug, and fasten with safety-pins; then th *dressing can be repeated as desired. Coir* is good because can be boiled and dried repeatedly. I have been infecte many times abroad, but I never worry, for I never go witho some sulphur. But whether it really is as excellent as I find can only be known by repeated experiments carried out und proper medical supervision. It should be good to sprinkle i shelters, and for that work probably the solution in an alkalin salt would be best, sprayed. The sulphur is precipitated as very fine powder. It is in this form that *it is* used so muc for trees, plants, etc. The use of sulphur by mouth is a very ol remedy. I think it is one used by the Assyrians or before then The confection of the brimstone and treacle is also a mo excellent laxative for anyone, especially children.

Varicose Ulceration

Dr. STUART MCAUSLAND (Liverpool) writes: It is probably the ex perience of others like myself who have large varicose vein and ulcer clinics that occasionally ulcers become reluctant to heal with the known methods of compression with sponge rubber and tight bandaging with "elastoplast." Recently I have found that such ulcers respond remarkably well if packed lightly with three or four layers of a dressing consisting of an open mesh gauze impregnated with petroleum jelly and balsam of Peru— the sponge rubber and elastoplast being then applied on the top of the dressings. In order to allow free discharge through the layers of the dressing, and in order to avoid disturbance of granu lations on removal, it is essential that the gauze have an open *mesh of about 2 mm.*, and that it be thoroughly impregnated with the petroleum jelly mass. This type of gauze is actually commercially prepared, being sold on the drug market under the name of "jelonet." I have used this preparation for some six months, and these indolent ulcers do fill up more rapidly as a result. It is, of course, important that an adequate amount of sponge rubber should be used. If there be much brawny thickening of the leg surrounding the ulcer it is a good plan to cut a small piece of the rubber to the size of the ulcer, and then to lay over it a very large piece of sponge rubber, which exerts pressure over the whole red, oedematous, and brawny area. The method also of bandaging is important. I am a great believer in the value of the "stirrup"—that is, a strip of elastoplast running down the side of the calf, under the arch of the foot, and up the other side of the calf, thus covering the whole rubber over the ulcer, which is usually lateral. A back strip of well, terminating under the foot, is then applied. Then the whole lower leg from the toes upwards is firmly bandaged. The value of the back and side strips is that they prevent creasing of the skin by the upward horizontal bandaging, and thereby avoid much discomfort for the patient.

SUPPLEMENT TO THE
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LONDON SATURDAY APRIL 19 1941

DOCTORS AND THE WAR DAMAGE ACT

As finally passed by Parliament, the (voluntary) chattels insurance sections of this Act provide free insurance for every householder up to a limit of £200, with an extra £100 if he or she is married, and £25 more for each child under 16. Non-householders obtain free insurance up to £50. These sums are payable after the end of the war, but carry 2½% interest from the time when the damage takes place.

Above these free limits, there is a premium of £1 % per annum up to a total of £2,000, £1 10s.% for the next £1,000, and £2% for the next £7,000; this is the maximum for which insurance can be obtained. Insurers must take out their policies with one of the recognized companies, or through Lloyd's, within one month of the coming into force of the scheme, which is now fixed for May 1. As no commission will be payable to agents, the Medical Insurance Agency cannot grant any rebates to those who take out policies under the Act; but members of the profession will nevertheless be wise to utilize the Agency, not only for advice as to the amount of their policies but with a view also to the help that can be given in getting prompt and satisfactory settlement of any claims that may arise. Policies must be for the full value of the chattels insured.

The medical profession also comes under the "business" scheme of the Act, but only in respect of professional equipment. This part of the Act is optional if the equipment is of less value than £1,000; compulsory if above that figure. There is no free insurance in this section, and those who do not insure will get no compensation. *It is still not clear* whether motor cars used in the practice come under these clauses concerning "professional equipment."

There are provisos limiting the amount of the claims that will be admitted in respect of works of art, gold and silver plate, jewellery, furs, books more than fifty years old, and so on. They are similar to the limitations laid down by many existing fire insurance companies, and may be regarded as part of normal insurance procedure.

Correspondence

A State Medical Service

SIR,—I have read with great interest and gloomy foreboding the detailed scheme for State Medical Service by Dr. Pybus (*Supplement*, March 15, p. 29). I should be glad if you would allow me to indulge in a little destructive criticism and to offer an alternative scheme. I submit that the scheme as outlined is too much of a medical Utopia. The following generalizations occur to me:

1. It has been shown time and again that medicine and bureaucracy are incompatibles.

2. General practice and consultant practice are two completely separate entities comparable to solicitor and barrister branches in law, and only slightly amenable to the system of promotion obtaining in the brother professions—the Church and the Services.

3. To say that private practice will in time die out altogether smacks too much of a medical dictatorship. There will always be patients and doctors who prefer to remain outside any scheme. They must be recognized and provided for.

4. The tradition of individual freedom must be preserved.

5. A panacea for all the ills suffered by the profession will not be found in a day or a year. The perfect plan will evolve from a small change, and by a process of adaptation, selection, and survival of the best and fittest arrive at great things.

6. General practice is the foundation stone of the whole structure of the profession upon which all schemes and plans must be built.

7. General practice is a generic term covering widely differing types. A practice may be urban or rural, or both. It may be situated in a wealthy, good, middle-class, poor, or depressed industrial district. One scheme will not meet the needs of all.

8. A State service for those with incomes under £250 or £500 in opposition to private practice as we now know it would produce a further schism in the profession, and is to be avoided at all costs.

9. A fixed salary destroys initiative and ambition. No one expects or hopes to make a fortune out of medicine, but for too long there has been a tendency among reformers to underrate the value of the work done by the profession as a whole. It must be remembered that every member of the profession is expected to maintain a high standard of appearance, most have families to educate and provide for, and there is always old age to be made secure.

I suggest the following alternative scheme, the aims of which would be: (1) to ensure that all the amenities of medicine are within reach of every member of the community; (2) to enable the profession to regain, retain, and maintain full control of all that which appertains to medicine.

There would be four stages in the evolution of the scheme:

Stage 1.—Contributory medical service would be adopted on a wide scale—that is to say, all general practice services now covered by the visiting and consultation fee would be covered by one quarterly family contribution, the amount of the contribution to be arranged between patient and doctor. In the case of the very poor the contribution would be made by the local authority. The old medical societies would be revived and new ones formed to administer the scheme, while the "donkey" work would be done by the local health offices.

Stage 2.—The medical society in each district would select and invite a group of consultants and specialists to join the society on the understanding that they would henceforth take their part in the evolution of the scheme. The local M.O.H. would, of course, already have been invited, and would form a most valuable link between the society and the Ministry.

Stage 3.—The growth of the clinics. The local authorities would cause to be built as many small clinics, at each of which three, four, or five doctors would work, as might be necessary according to the size of the district and the density of the population. The clinics would be fully equipped and staffed with nurses by the local authority. Each doctor would rent his consulting-room. These would be the sub-clinics. There would be in each district one central clinic, the headquarters of the local medical society. This would include outpatient departments, hospital with private block, maternity hospital, private waiting and consulting rooms, and nurses' home. All cases, with the exception of casualties, would first be seen and sent from a doctor at a sub-clinic. The administration of the central clinic would be carried out by the members of the society themselves. The M.O.H. would act as medical superintendent, with his staff of office clerks doing the clinic business, and beyond him the Ministry acting as eternal guide, philosopher, and friend. The acting medical staff would be appointed from those general practitioners who applied and were elected to the various posts; the consulting staff would already have been invited, and might, of course, be added to at any time or replaced as they moved up the ranks as consultants. The practitioner in charge of the case at the sub-clinic would be able, if he wished, to continue to care for it at the central clinic even if he was not on the acting medical staff. House officers would be appointed in the various departments of the clinic.

Stage 4.—The whole country would be divided into regions, and in each region there would be one general teaching hospital with as many satellite hospitals as might be necessary. All central clinics in each region would be attached to the general hospital. These would be staffed by consultants who would fill their beds from cases seen at the clinics. At first the consultants would be attached to clinics in various regions (it may not be clear that a consultant or specialist may be attached to several clinics), but in time it would be found that, as the new men came along, the hospitals and clinics would be strictly regional. The general hospitals, their satellites, and the sites they were built on would become the property of the State. The highest administrative posts in each hospital would be State-paid, and should be regarded as the plums of the profession. The consulting staff of the hospitals would remain ordinary members of the profession not under State control. This is analogous to the courts of law, where some members of the legal profession are Crown servants and others not. The administration of the hospitals would be in the hands of the members of the staff.

As to the finance of the scheme, three funds would be established: general practitioner, consultant, and hospital. The public would make contributions to the first two only, while the State would contribute to all three. The contributions made into the general practitioner fund by each family would vary in the same manner and for the same reasons that the present visiting and consultation fees vary. That is to say, they would be arranged to the mutual satisfaction of patient and doctor at or above a minimum figure to be settled by the medical societies. The society's almoner would decide in cases seeking the help of the local authority for all or part of their contribution. Freedom of choice remains common to patient and doctor. The amount due to each doctor would be calculated from the amount contributed by each family on his list.

Each family contributing to the general practitioner fund would contribute an amount equal to one-quarter of this contribution to the consultant fund. This fund would be collected and administered in the same way as the general practitioner fund. It would provide a retaining fee to each consultant and specialist attached to the central clinic, a modified fee for each case seen or treated at the clinic, and also full maintenance costs for each patient receiving treatment at the clinic or general hospital. In cases of necessity the State would make these contributions also for the family.

Contributions and payments to the general hospital fund would be made by: (1) the central clinics, from both the above funds as a form of voluntary levy; (2) the consultant fund, for maintenance costs and consultants' fees; (3) existing endowments, etc.; (4) student fees; (5) the State, if necessary a grant made in the form of a contribution. This fund would provide the salaries of all employed at the hospital and the maintenance cost of each patient, also the retaining fees of the consulting staff and the consulting, etc., fees due to them. It would not include the salaries of the State servants holding high administrative posts.

I suggest that this alternative scheme fulfils the two original aims and would improve conditions throughout the whole profession. Not only would the patient know exactly what his bill of health for the year was to be, but he would be far more likely to remain in the hands of one doctor and see him early in his illness. The doctor would know who his patients were and that he could see them as frequently as he wished to. He would thus be able to practise preventive medicine on a much larger scale. His practice would increase enormously in value, while his increased income would allow him to take reasonable holidays and leave for postgraduate study, and also to employ all the assistance he needed. Not only would the scheme absorb all members of the profession now in practice: it would also create an enormous demand in the ranks of general and consultant practice.—I am, etc.,

Beckenham, April 7. ALAN MARSH.

SIR,—I welcome the extremely sound and well-balanced letter by Surgeon Lieut. Peter Shutte (*Supplement*, April 5, p. 41), a man from my own hospital. I thoroughly endorse all that he says and I feel that he has cleared away a great deal of rotten wood. The fact remains that whether we eventually wear the peaked caps and brass buttons of a State service or not, the great bulk of medical work in this country will consi similar work to now, conducted in a similar way—th family or general medical practice. It is extremely dif to see, therefore, how such a metamorphosis as Dr. Pybus outlines can bring about any great or radical imp ment. It is likely to produce a semi-paralytic, time-serving tapish type of public servant. The practice of medici essentially a personal affair between patient and doctor. extension of the panel system with great improvements (forbids outlining these here) is to be visualized and is a re able form of evolution. The local hospitals should cea be mere privileged hunting grounds and private preserve the few, but should be thrown open to all practitioners i area, thus assuring that all practitioners should take pa the work of their local hospital and should work in touch with it.—I am etc.,

Oxford, April 7. CHARLES A. H. FRANKLYN, M.

WEEKLY POSTGRADUATE DIARY

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.—*Daily*, 10 to 4 p.m., Medical Clinics, Surgical Clinics and Operations, Obstetrica Gynaecological Clinics and Operations. *Daily*, 1.30 p.m., Post-m demonstrations. *Mon.* 2.30 p.m., War Operative Surgery Course comm *Tues.*, 11 a.m., Paediatric Clinic, Dr. R. Lightwood. *Wed.*, 11.30 Clinico-pathological Conference (Medical). *Thurs.*, 2 p.m., Dermatol Clinic, Dr. R. T. Brain; 2 p.m., Radiological Demonstration, Dr. D White. *Fri.*, 12 noon, Clinico-pathological Conference (Surgical); 2 Clinico-pathological Conference (Gynaecological); 3 p.m., Sterility C Mr. V. B. Green-Armytage.

DIARY OF SOCIETIES AND LECTURES

ROYAL SOCIETY OF MEDICINE

Section of Medicine.—Tues., 4.30 p.m. Discussion: Nature and Treat of the Effort Syndrome. Openers, Dr. H. J. Starling, Dr. Paul W Dr. Aubrey Lewis, and Dr. Maxwell Jones.

General Meeting of Fellows.—Tues., 5 p.m. Candidates for election to Fellowship.

Section of Comparative Medicine.—Wed. 4.15 p.m. Annual General Mee Election of Officers and Council for 1941-2. Discussion: Swine Influ in the British Isles. Opener, Mr. F. Blakemore. Paper by Miss M Macfarlane and Dr. B. C. J. G. Knight: Some Enzymic Activitie *Cl. welchii* Toxins. Members of the Section of Pathology are spec invited to attend the meeting.

Clinical Section.—At British Postgraduate Medical School, Ducane Road, Thurs., 3 p.m. (Cases at 2.15 p.m.)

Section of Orthopaedics.—At Wingfield-Morris Orthopaedic Hospital, Hea ton, Oxford, Sat., 11.30 a.m. Papers by Dr. A. H. Robb-Smith and J. C. Scott, Fat Embolism; Mr. W. B. Foley, Report on Cases of Sc Arthritis. 2 p.m., Dr. J. M. Barnes and Mr. J. C. Scott, The Sprea Bacteria and Toxins from Infected Wounds—the Clinical Application Laboratory Findings.

Section of Physical Medicine.—At Chertsey Sat., 2.30 p.m. Discuss Observations on the Value of Electrodiagnosis and Electrotherapy Peripheral Nerve Lesions. Opener Dr. P. Bauwens.

DAVYHULME MILITARY HOSPITAL MEDICAL SOCIETY.—*Thurs.*, 3 p.m. cussion: Vincent's Angina. To be opened by Captain J. Winter. Med men and women in any Services (including civilian) will be welcomed.

Diary of B.M.A. Central Meetings

APRIL

23 Wed. Council, 12 noon.

MAY

1 Thurs. Journal Board, 2.15 p.m.

B.M.A.: Branch and Division Meetings to be Held

LANCASHIRE AND CHESHIRE BRANCH: BIRKENHEAD AND WIRRAL DIVISION. At Pensby Hotel, Pensby, Sunday, April 27, 5.30 p.m. Annual Meetin Election of Officers. 6 p.m., Meeting of all medical practitioners in the ar of the Division for election of Local Medical War Committee.

APPOINTMENTS

MCINTYRE, C. M., M.B., Ch.B., Medical Referee under the Workmen's Co pensation Act, 1925, for the Island of Islay (Sheriffdom of Argyll).

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. Th amount should be forwarded with the notice, authenticated with the name a address of the sender, and should reach the Advertisement Manager not lat than the first post Tuesday morning to ensure insertion in the current issue

MARRIAGES

SYMONDSON—LEWIS.—On March 8, at Rhiwbina, Cardiff, Captain J. L Symondson, R.A.M.C., to Alicia Lewis, M.B., B.Ch., Hunecott, Kingsbridge Devon.

WILLIAMS—PASCOE.—At St. Pancras Church, Thursday, April 10, Hargreaves Harley Williams, M.D., to Elizabeth Mackay Pascoe.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 26 1941

SUCCESSFUL GRAFTING OF ADRENAL GLAND IN A CASE OF ADDISON'S DISEASE*

BY

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AND

F. MAINZER, M.D.

Directors respectively of the Surgical Department and the Department of Medicine, the Jewish Hospital, Alexandria

The results of transplantation of adrenal tissue in numerous animal experiments do not, on the whole, encourage the use of this method in cases of adrenal insufficiency in man. Moreover, the operation on the animal is carried out under ideal conditions, whereas in man the recipient of the graft is usually extremely ill and the choice of donor is also necessarily limited. Clinical reports of unsuccessful attempts to treat Addison's disease by transplantation of the adrenals are frequent in literature, and even the few reports of successful transplantations are not above criticism.

In the first place, unmistakable proof is needed that the case is one of Addison's disease. Thus, in one case which had been apparently cured by transplantation treatment the eventual necropsy showed that the adrenals were healthy while the graft had decayed (Conybeare and Mills, 1924). Again, in view of the well-known clinical variations in the course of the disease, short periods of improvement with increased blood pressure should not be considered to be the result of transplantation therapy. Transplantation should not be looked upon as clinically successful unless there is a definite improvement extending over a period of months in a case of undoubted Addison's disease. So far as we are able to judge there are no more than five cases in the literature which fulfil this requirement. These are the cases of Reinhart (1928), Halperin and Arkuschenko (1927), Leschke (1928), Beer and Oppenheimer (1934), and Goldzieher and Barishaw (1937). The periods over which these cases were observed subsequent to operation varied from five months to one year.

We are able to add a sixth case to this list—a successful grafting in an indisputable case of Addison's disease, although an atypical one owing to the absence of pigmentation. The patient was under our observation for nearly three years before operation and for fifteen months since operation.

Case History

The patient, a woman aged 56, had undergone hysterectomy at the age of 34 on account of persistent haemorrhage due to myoma. Apart from this she had apparently been healthy, and had had two normal pregnancies. The disease for which she was eventually treated by grafting began very gradually ten years earlier, progressed slowly, and was interrupted by periods of improvement. She became languid and easily fatigued, took less interest in her environment, and became indifferent even with regard to her own health.

The physical symptoms during the course of years included intermittent intestinal disturbance accompanied by painless diarrhoea, which had been mistaken for and treated as enterocolitis. *X*-ray examination of the intestinal tract revealed nothing abnormal. The blood pressure, which had not been taken before the onset of the disease, was always low—between 80 and 90 mm. Hg—and during the more severe phases it was below even this level. The disturbances of temperature were characteristic. The Egyptian winter, generally regarded as agreeably temperate, seemed to her unpleasantly cold. Her body temperature under normal conditions was low—about 97° F. taken rectally—and even during acute infectious illnesses it hardly ever rose above 100.4°. Moderate wasting became unmistakable, even in the early stages of the disease, and increased rapidly in the later stages. The patient lost 22 lb. in the course of six years, half of it in the first six months of 1935. She often suffered from nausea, though vomiting did not actually occur, and she complained of "rheumatic" pain in the musculature of the back.

Two incidents in this history were noteworthy. In June, 1935, she had severe pain in the upper abdomen, the stools assuming a whitish sheen, but there was no jaundice, and the urine on examination was normal. This condition persisted for a week, and was treated as "liver colic" by her doctor. Some months later an attack of "oppression of the heart" occurred, the pain radiating into the left arm. During both these incidents the blood pressure was found to be below 80 mm.

For a time the patient had intravenous injections of glucose, and always felt particularly well for some hours subsequently. To combat the emaciation insulin was given, but even 3 units gave rise to symptoms of overdosage—profuse sweating, tremor, dizziness, and faintness—and had to be discontinued. Such attacks, which resembled angina pectoris, were treated by withdrawal of salt, but the effect of this measure was a rapid increase of weakness, somnolence, muscular pain, and nausea, so that the patient had to return to her usual food, which contained salt at random.

During 1935 all the above symptoms became more pronounced. Malignant tumour was suggested, but examination revealed only a trophic ulcer of the vagina, which on histological examination gave no sign of malignancy.

It was at this time that we first saw the patient. Her bad general condition and cachectic fatigued appearance were noted. There was no abnormal pigmentation or distribution of hair. The blood picture was as follows: erythrocytes, 3,900,000 (later 3,400,000) per c.mm.; haemoglobin, 75% (later 68%); leucocytes, 7,500 per c.mm.—neutrophils 55%, lymphocytes 41%, eosinophils 1%, monocytes 2%, band-like polymorphs 1%. The Wassermann reaction was negative. The blood sugar was 100 to 115 (later 91) mg. per 100 c.cm. The electrocardiogram showed no marked deviation from the normal, and a radiograph of the renal area gave no indication of calcified glands.

Treatment with anterior pituitary extract over several weeks was without result. The administration of cortical extract was then started, the patient receiving daily, and later every second or third day, intravenous injections of 10 c.cm. The result was immediate and impressive: the weakness, muscular pain, and somnolence disappeared, and within two months the patient had put on 11 lb. in weight.

*Abridgment of paper received from Egypt.

For one year all went well, and it was possible to reduce the extract to 20 to 30 c.cm. a week, given intramuscularly. Then a severe crisis occurred following some days of over-exertion and domestic worry. There was nausea with frequent vomiting and fatty diarrhoeic stools, and the abdominal musculature was rigid and painful to pressure. Blood pressure dropped to 70 mm. In view of the patient's very thin veins and the collapsed circulation, intravenous administration of considerable amounts of fluid could not be undertaken Fluids (1,200 c.cm.) with 20 grammes of salt were given daily, mostly by mouth and to a small extent rectally. The patient received daily 80 c.cm. of adrenal extract (cortin and eschatin), and with eventual improvement the amount was reduced to 70 and later to 50 c.cm a week, given intravenously. But the former condition of comparative ease could not be regained. The patient's complexion became more yellowish, with a clay-coloured tinge, and freckle-like spots appeared on the backs of the hands and on the face; but the typical Addison pigmentation was not shown, nor was there at any time pigmentation of the mucous membrane of the mouth.

The Operation and After

This was the condition until August, 1938, when a severe Addisonian crisis occurred, due immediately to the damp heat prevailing at that time in Alexandria (86°, with 95% humidity). The amount of extract was increased to 40 c.cm. daily, but the blood pressure dropped to 70 mm.

In this crisis it was decided to graft into the patient the left adrenal gland of a man who had died just previously from a cerebral tumour. The donor was 52 years of age, and belonged to the same blood group as our patient. The graft was made in the abdominal musculature on the left side, under local anaesthesia.

[Here followed in the complete paper a detailed description of the operation.]

Soon after the operation the symptoms of adrenal insufficiency reached their climax—increased somnolence, uncontrollable vomiting, frequent diarrhoeic stools, collapse of circulation, and fall of blood pressure to 60 mm., this in spite of the fact that the daily administration of extract had been increased to 80 c.cm. and that of salt to 50 grammes. Within three days of the operation, however, the condition improved, the dose of extract was reduced, and no more was given after the seventh day, and the patient declared that she felt absolutely well. She left hospital on the sixth day after the operation. During the next two months the blood pressure varied between 115 and 135 mm., the colour of the skin became lighter, and the freckle-like spots were no longer so intensely coloured. But any great exertion or excitement always produced slight somnolence and pain in the back, and during an influenza attack, when the blood pressure was lowered to 80 mm., it was necessary to give 10 to 20 c.cm. of extract for some days.

Comment

From the results of experiments on animals it seems irrelevant to the success of the operation where the grafting takes place (ovary, testis, kidney, musculature), nor does the type of transplantation (whether the organ is cut into slices or grafted as a whole) seem to be of significance. As the operation has been shown to be more likely to succeed in some species of animals than in others, it may be that in man the conditions are exceptionally unfavourable. It has been demonstrated in a great number of animal experiments (Loeb, 1930, 1937) that transplantation in general is more successful the closer the blood relationship between donor and recipient, and in respect of the adrenal gland in particular this has been recently emphasized by several workers (Ingle and Higgins, 1938; Ingle, Higgins, and Nilson, 1938). When selecting the donor the utmost the surgeon can do is to consider the blood group.

The result of the grafting operation must be largely dependent on the bodily condition of the recipient, and in Addison's disease particularly it must not be lost sight of that the insignificant surgical procedure of grafting endangers the patient's life. Treatment by extract before, during, and after the operation has therefore undoubtedly improved the prospects of success.

In our patient the adrenal graft is able to meet the requirements of normal life, but if the demand is above normal it fails. This cannot be due to the fact that there is only one adrenal gland fully functioning, because such symptoms of insufficiency are not met with in cases in which one adrenal gland has been removed by operation. On the contrary, there is complete accordance between our observations and those on the functional behaviour of grafted adrenals in the animal (Ingle, 1937; Perla and Gottesman, 1931a, 1931b; Wyman and tum Suden, 1937).

Summary

In a severe case of Addison's disease the adrenal gland of a patient belonging to the same blood group, who had just died, was grafted into the abdominal musculature. The functional results, as observed over a period of fifteen months after operation, are excellent. A state of compensation has been produced so long as the patient lives under normal conditions. Only after special exertion or during a transitory infection, with increased demand on the adrenal gland, are slight signs of insufficiency noted.

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TREATMENT OF 100 WAR WOUNDS AND BURNS

BY

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During recent enemy activity over this country 100 wounded men have been under our care in a military hospital. The great majority were admitted within six hours of injury, unlike those described in previous articles on surgery in the present war (Cohen and Schulenberg, 1940; Brown, Dennison, Ross, and Divine, 1940).

Some 50 of our patients were airmen, both Allied and German. They were brought in within an hour or two of their injury. Excited, with nerves still keyed to the highest pitch, with heads still spinning from the swift rush earthwards, and with wounds bleeding freely from the battle, they formed a striking contrast to the Dunkirk soldiers with their grimy and inflamed wound holes often several days old.

These cases afforded an opportunity of carrying out modern treatment and, as some were in for several weeks, for observing their clinical progress. The preliminary anti-shock measures—warmth, morphine, hot fluids—were necessary in all except trivial cases. Some patients required either blood or plasma. When salines were indicated we often used the intramuscular route for injection in order to eliminate the risk of oedema of the lungs (Billimoria and Dunlop, 1940). The problem of assessing

the precedence for operation, so important with a rush of casualties, did not concern us: with small numbers coming in there was always adequate time to deal with each case separately.

Wounds of the Limbs

Wounds of the limbs constituted the greatest number of our cases, the majority being compound fractures. Complete excision of the wound layer by layer was undertaken in these cases if treatment were instituted within the first eight hours. After excision reduction was carried out, often under the *x*-ray screen. After eight hours we employed surgical cleansing and enlargement to facilitate drainage—that is, "débridement" in the modern sense (see Morrison, 1940a, 1940b; Mackenzie, 1940: Bailey, 1940: d'Offay, 1940).

The removal of retained foreign bodies was incidental to the general cleansing of the wound. In early cases in good condition a careful search was undertaken, especially in the neighbourhood of joints, where, owing to constant movement, it was considered there was less chance than elsewhere of a retained fragment of projectile being walled off and rendered innocuous. Preliminary radiographs were essential, especially in cases presenting an entry wound and no exit wound, with the certainty of a retained projectile. All such cases should be sent, if possible, to places where *x*-ray facilities exist, and should not be explored "blind" first.

The multiple minute fragments of aircraft-cannon shell peppered over the skin and in the superficial tissues were left alone. We painted the puncture holes—sometimes as many as sixty or seventy—with iodine or gentian violet without applying dressings, as Bonnin (1940) suggests. Dressings, in fact, were best left off in such cases owing to their tendency to absorb the antiseptic dyes from the skin (Fleming, 1940).

Through-and-through bullet tracks caused by accidental discharge of firearms, without retained projectile, were often encountered. If not involving bone or large vessels we left them alone. It was astonishing how often these bullets missed or pushed aside important structures. In one case a 0.45 revolver bullet, entering just below the right fibular head, traversed the anterior compartment of the lower limb and came to rest overlying the first cuneiform, whence it was easily removed without fracturing any bone or damaging any nerve.

Tracer-bullet injuries were also seen. A pilot officer had his left humeral head shattered by a tracer bullet: the wound was still smoking furiously till completely excised. In such wounds the tissues around the bullet fragments were burned as well as torn. Extensive shattering injuries caused by fragments of high explosive from the German "Channel Charlies," with their potential risks of grave infection, were also seen.

We found the times for primary suture given by Jeffrey (1940) a useful guide. He states: "In the upper half of the body, including the arms, suture may be attempted up to twelve to fourteen hours after injury. In the lower limbs the limit should be six hours." We did not close up any wound, however, until it was completely excised. No muscle or tendon or nerve was sutured, the only catgut introduced being to ligate main vessels. The first part of the axillary artery was successfully ligated in one case to control a wound of the third part of the vessel. It was considered that prolonged hunting for a damaged nerve in a recent wound was inadvisable. Such cases when healed were sent to a neurological centre for secondary suture.

The wounds were lightly packed with acriflavine-paraffin gauze to prevent collections of blood in the depths and to act as drains. No wound was packed at all tightly, as it was found that tight packs elsewhere introduced into partially cleansed wounds to control haemorrhage as a first-aid measure invariably caused severe pain and inflammatory reaction and required removal in forty-eight hours.

The wounded limbs were then immobilized in plaster-of-Paris. Our technique followed well-recognized lines based on the improvements of the Winnett Orr treatment resulting from experience of surgeons in the Spanish War (Trueta, 1939: Jolly, 1940; Tudor Hart, 1939). No case was treated by Carrel-Dakin irrigation, which, though evidently still used in America (Hermann, 1940), is not employed in present war surgery. Wounds treated elsewhere, not immobilized, or inadequately immobilized on splints, were also put into plaster, with immediate cessation of discomfort, throbbing, and pain. Our plasters were skin-tight except in wounds left open and expected to ooze considerably. In these much cotton-wool was packed over the wound for the reception of discharges inside the plaster (Pannett, 1940). No "windows" were ever employed, the risk of window œdema being well known.

The patients were left undisturbed till the seventh to tenth day in soft-tissue injuries, and the fourteenth to twenty-first day in fractures, by which time the plaster had become loose and was no longer fulfilling its purpose of immobilization. Their progress was painless and afebrile. The plasters were then removed and packs and stitches taken out. A healing granulating wound covered by a variable quantity of thick pus and scabs was constantly observed, with no trace of active inflammation. The presence of dead tissue, as pointed out by Carrel and stressed in a recent paper by Riley (1940), had evidently acted as a stimulation to the proliferation of cells in the process of healing. The wounds were re-dressed, this time with merely a thin strip or wick leading into the wound cavity, easily capable of being extruded by the tissues. Superficial cutaneous irritation around some wounds yielded quickly to application of aqueous gentian violet. No septic lymphangitis or lymphadenitis was seen; no case had a secondary haemorrhage. The observation of Trueta and Barnes (1940), that immobilization in plaster minimizes lymph flow and therefore decreases the chances of absorption of bacteria and their toxic products, was confirmed.

Plaster immobilization was continued till the wound had healed completely. If not, the wounds and the limb inevitably became slightly painful and uncomfortable. Discomfort ceased at once on re-immobilization. No physiotherapeutic measures were started till the wounds had thoroughly healed.

Visceral and Facio-maxillary Wounds

Penetrating wounds of the abdomen and chest were also encountered. The importance of the "time-lag" in visceral lesions was well realized. The extensive intraperitoneal damage produced by projectiles entering through the buttock was again observed in our series. In one patient resection of four feet of small intestine in addition to suture of bladder and rectum was required, but, unlike Gordon Bell's successful case (Gordon-Taylor, 1939), this man died. The causal factor was the initial haemorrhage from the mesenteric vessels. In another case—a through-and-through wound of the right flank—a bruise of the lateral border of the ascending colon was the only visceral lesion, and was not extensive enough to require Jolly's (1940) reperitonizing operation.

Several facio-maxillary injuries were encountered. With a minimum of excision, displaced hard and soft tissues were sutured back as nearly as possible to the normal position, avoiding tension in the replaced structures.

Suturing was found essential, even at the expense of slight distortion, in order to control the very profuse and sometimes dangerous haemorrhage so common in these wounds.

The high frequency of abscess formation which supervenes in the lower jaw after such injuries (see Report on Maxillo-facial Injuries, 1939) rendered primary drainage advisable. In one case—a through-and-through wound shattering both superior maxillae and the nasal septum—a bilateral Caldwell-Luc operation was performed, on the advice of Major Cowper Tamplin, R.A.M.C., to facilitate drainage. The lessening of muco-purulent discharge from the traumatic facio-antral fistulae in this man (a German pilot sergeant), the evident improvement in the closure of the facial wounds, and the lessened risk of severe ectropion on the left side were gratifying. We had the co-operation of Lieut. C. L. Douglas, Army Dental Service, in the treatment of these cases, and they were transferred as soon as possible to a facio-maxillary centre.

Treatment of Burns

Fifteen burns came under our care. They were chiefly of the face and hands, of the first and second degrees, with small areas of third degree. We employed the immediate-coagulation method of combined tanning with silver nitrate 10%, tannic acid 10%, and gentian violet 1% aqueous solution, as described by Dennison (1939). Tannic acid has been used successfully, with various modifications in technique, in the present war (Cohen, 1940a; Gordon, 1940; Heggie and Heggie, 1940; Brown, Dennison, Ross, and Divine, 1940; Ross and Hulbert, 1940).

Thorough preliminary cleansing under anaesthesia was carried out first to eradicate the sepsis that is so likely to supervene and produce scarring and contractures even in burns of first and second degrees. It has been said that "wound excision as a general principle still stands as the surgeon's sheet anchor" (Max Page, 1940). Similarly, adequate preliminary cleansing is the sheet anchor of the treatment of burns.

After cleansing, the triple tan solutions were applied, and coagulation was accelerated by the use of an electric hair-drier. The tan was applied without any break in continuity over the flexor aspects of joints. A degree of splinting of the joints was therefore produced which was not considered unbeneficial, as the parts were placed temporarily in immobilization, the optimum state for healing of any wound. The supple coagulum of the triple tan proved far superior to the rigid eschar of tannic acid alone, and allowed gentle movements to take place without cracking. Movements of affected fingers were allowed from the seventh day onwards, any cracks appearing in the coagulum being filled by a reapplication of the tanning mixture. The pliability resulting from a thin application of the triple tan proved of special value in the treatment of burnt eyelids, whose essential mobility was thus maintained.

Oedema did not develop to any extent in our cases, the main factor in the oedema of burns—infection—having been controlled by the initial cleansing. What little oedema did appear cleared up on elevating the part on pillows. The absence of pain and sepsis was very noticeable. No necrosis of phalanges was seen, and there were no contracture scars. The results were uniformly satisfactory.

Chemotherapy

Chemotherapy was employed in only a few selected cases in our series of wounds and burns. Primary infections by haemolytic streptococci occur in only about 5% of cases with open wounds (Colebrook, 1940), and one of the few wounds we left accessible for investigation purposes—a penetrating abdominal wound—was sterile to culture on admission. Infection by streptococci more commonly occurs in hospital. The plaster immobilization technique minimizes this, for plaster cases militate against the ingress of haemolytic streptococci from the nasopharynx and hands of dressers (Hare, 1940).

Dealing with very recent wounds sustained in aerial combat and in an area where the soil is relatively "clean," we did not consider chemotherapy in any form an essential part of treatment. We employed sulphapyridine prophylactically—its most effective use, according to Buttle (1940)—in several large wounds in which complete wound toilet had not been possible and in which projectile fragments and devitalized muscle were still *in situ*. The dosage was two tablets (each 0.5 gramme) by mouth four-hourly for twenty-four hours, followed by 0.5 gramme four-hourly for the next forty-eight hours. The local application of sulphanilamide powder was not tried. None of our cases showed any streptococcal infection.

Sulphapyridine was given in massive doses in the one case which grew a culture of anaerobic organisms. This was a bomb-fragment injury of the right forearm, with broken ulna and sloughing flexor muscles, that reached us second-hand in an infected state. The benefit of chemotherapy was not noticeable, and amputation was eventually necessary.

All our cases had antitetanic serum either on or before admission, and no case of tetanus was seen.

Anaesthesia

Pentothal sodium followed by nitrous-oxide-and-oxygen administered by Boyle's apparatus has been used in almost all cases. The average British soldier has a phenomenal appetite for all anaesthetics. It was found that an average of 6 to 8 c.cm. of 5% solution was necessary for induction, and a satisfactory state of anaesthesia could not be obtained with less than 16 to 18 c.cm. This anaesthetic lasted for about twenty to thirty minutes, and the patient was round in under an hour. Some cases required about 30 c.cm. for half an hour's anaesthesia. These cases were not round for about two hours, and were drowsy for the remaining twenty-four hours. This confirms the findings of R. H. Moore (1940). When gas-and-oxygen was used as a supplement a smooth anaesthesia with good relaxation and a rapid recovery was obtained. For facial burns and injuries we used pentothal. It proved an ideal anaesthetic for all cases in which a clear airway could be maintained.

The R.A.F. fighter pilots were often brought into hospital in a highly excited state, and it took a great deal of gentle coaxing to persuade some of them to accept even a prick in the arm; any question of inhalation anaesthesia would have raised strong objections. It is now our custom to prescribe omnopon 1/3 grain and scopolamine 1/150 grain one hour beforehand. Phenobarbitone, 1 grain twice daily, is also prescribed for several days afterwards. Many patients have expressed the view that in the future they will not so much mind being wounded if they know that they will have such a pleasant anaesthetic.

In a few cases it was found necessary to operate before the patient had recovered from his shock, in order to arrest haemorrhage or, as in one case, to remove a burning tracer bullet. In these cases pentothal administered slowly gave satisfactory results. As in many instances the patient was already receiving intravenous saline, the pentothal sodium was added to it in the ward, and the patient fell asleep without even knowing that the administration of the anaesthetic had begun. The Army pattern transfusion set was used, 1 gramme of pentothal being added to 200 c.cm. of glucose-saline. The solution was run in at about 120 drops a minute until unconscious-

ness was produced, and then continued at about 40 drops a minute for the duration of the operation, the rate being increased or reduced according to the individual circumstances.

Severely shocked patients were not touched at the end of the operation, but when circumstances permitted were left on the table for several hours. We considered that lifting a gravely ill patient on and off the table, rolling him to put on bandages, and putting him into bed would have been almost certain to tip the balance in the wrong direction.

Local anaesthetics were never used in this series. Several cases admitted second-hand after having had wounds excised and explored for foreign bodies under local anaesthetics were found to be painful and infected. This unfavourable condition had been caused or aggravated in some measure by the insertion of a local anaesthetic into tissues potentially infected and certainly devitalized.

Summary and Conclusions

100 wounds caused by the projectiles of warfare, the majority of them recent, have been treated.

Excision in early cases, and débridement in later cases, followed by adequate immobilization in plaster-of-Paris, have been successfully employed.

Efficient immobilization lessens the incidence of infection in wounds and materially aids its resolution when once it has set in.

Chemotherapy is not necessary as a routine in the treatment of early wounds occurring in areas where the soil is not heavily contaminated with anaerobic organisms. Its best use is as a prophylactic agent in large wounds which it has not been possible to clean completely. We agree with the suggestion of a Field Ambulance officer, Lieut. E. S. Watson, R.A.M.C., that it should be employed as a first-aid measure at the same time as antitetanic serum is given to wounded men for whom adequate surgical excision may not be available for many hours.

The silver-nitrate–tannic-acid–gentian-violet treatment of burns again proved successful. We endorse the defence of tannic acid by Park (1940) and the opinions expressed in Cohen's (1940b) summary.

Pentothal intravenously has proved a safe and satisfactory agent for routine use in war surgery.

The use of local anaesthesia in the treatment of war wounds is strongly deprecated.

We wish to thank Major H. G. Hobson, R.A.M.C., for invaluable aid and criticism, and for permission to record our findings. We are also indebted to Lieut. W. Carton Winterbottom, R.A.M.C., who co-operated with us in the administration of many of the anaesthetics in these cases.

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A SIMPLE METHOD OF ESTIMATING PROTHROMBIN IN CAPILLARY BLOOD

BY

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AND

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The estimation of the prothrombin content of the blood is recognized as a necessary step in the investigation of the haemorrhagic states in general, and it is of particular value in cases of obstructive jaundice prior to operation and in haemorrhagic diseases of the newborn. The method described by Quick (1938) is usually employed. This entails the withdrawal of 4.5 c.cm. of blood either from a vein, which may be difficult to locate in obese or collapsed adult patients, or from the anterior fontanelle in infants, a procedure which the clinician may be unwilling to undertake in view of the haemorrhagic tendency.

If the prothrombin in capillary blood could be estimated in a simple and satisfactory manner the scope and application of such an investigation would obviously be extended. The following method, employing capillary whole blood and snake venom as a source of thromboplastic kinase, can be performed in a few minutes. We have carried out this test on a large series of normal persons, newborn infants, and patients with obstructive jaundice and liver damage, and have found that it gives results comparable to those obtained by Quick's and other methods.

Method and Materials

A standard white-blood-cell-counting pipette is used to measure the various ingredients. It is better to have a number of such pipettes, but if only one is employed it must be cleaned thoroughly with saline after measuring each ingredient. A solution of crystalline sodium oxalate (13.4 grammes per litre) is drawn up into the pipette, and a quantity equal to one division of the pipette is blown into a clean watch-glass. The skin is punctured so that the blood flows freely without squeezing. In infants the heel is the most suitable site. Blood is drawn up to the ninth division and then transferred to the watch-glass. Thorough mixing of blood and oxalate solution is effected by means of a small glass stirring-rod. The snake venom used is Russell-viper venom, supplied by Burroughs Wellcome and Co. under the name of stypven. The solution is prepared by adding 1 c.cm. of distilled water to 0.1 mg. of the venom in dry form. A freshly prepared solution is best, as the efficacy of the venom in solution decreases after a few days. Stypven solution and a solution of anhydrous calcium chloride (2.775 grammes per litre) are in turn sucked up into the pipette to the tenth division and are mixed with the oxalated blood in the watch-glass. Following the addition of the calcium chloride solution, visible fibrin formation usually occurs within twenty-five to thirty-five seconds as timed with a stop-watch. The change is best seen against a white background. The test is repeated on a normal person at the same time and under the same environmental conditions,

and the prothrombin index of the patient's blood is expressed as a percentage of this normal, as follows:

$$\text{Prothrombin index} = \frac{\text{Normal prothrombin time}}{\text{Patient's prothrombin time}} \times 100$$

With practice a high degree of accuracy can be obtained in assessing the coagulation time. Thus repeated estimations done on the same individual under standard conditions show a deviation of only one or two seconds.

It has been shown by Quick (1938) and by Fullerton (1940) that a marked lengthening of the coagulation time occurs only when the level of the prothrombin in the blood falls to 20% of normal or less. By diluting the blood of both the patient and the control to 20% with normal saline, minor differences in the coagulation time become more apparent. If it is desired to adapt this modification to the present technique, a quantity of normal saline equal to forty divisions of the white-cell pipette are added to the ten divisions of oxalated blood present in the watch-glass. After mixing thoroughly, a quantity of this mixture equal to ten divisions is transferred to a second clean watch-glass, in which the test is completed. It should be noted that the effect of such dilution makes it somewhat more difficult to see the onset of fibrin formation.

Comparison with Kato's Test

Our attention has recently been drawn to a paper by Kato (1940) in which he describes a test for estimating prothrombin using capillary whole blood. He states that many hundreds of such tests have yielded results comparable to those obtained by Quick's method on venous blood. The differences between the method described here and Kato's technique are as follows:

1. The use of a white-blood-cell-counting pipette obviates the need for obtaining the special microhaemopipette designed by Kato (1938).

2. The use of snake venom as a source of thrombokinase as described by Fullerton (1940) eliminates the necessity for preparing a brain extract as used by Kato

3. The carrying out of the test on a normal control person at the same time and under the same environmental conditions is felt by us to be a fundamental part of the method. In Kato's method no control on normal blood is done, reliance being placed on standardizing the solution of thromboplastin so as to produce a clotting time of approximately twenty seconds. The control eliminates the effect of minor variations in the solutions used and the changes in the clotting time which result from variations in temperature and humidity. In practice we use our own blood as a control, and have found that the clotting time of undiluted normal blood may be as short as twenty to twenty-five seconds in the heated nursery of the maternity pavilion and as long as thirty-five to forty-five seconds in the cooler general hospital wards in winter-time.

One of us (J. I.) was in receipt of the McCosh Bursary and Crichton Scholarship in Medicine during the period of this investigation.

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Dr. Albert B. Sabin and Dr. Joel Warren (*Science*, 1940, **92**, 536) point out that the toxicity of most available gold compounds is perhaps the greatest barrier to their more widespread use in the treatment of rheumatoid arthritis. In their search for a compound which does not possess this danger of toxicity they have found in preliminary experiments on mice that calcium aurothiomalate fulfils this desideratum. Whether this compound is equally harmless to human beings has yet to be determined by clinical trials.

MULE-SPINNER'S CANCER

BY

E. M. BROCKBANK, M.D., F.R.C.P.

As a medical referee for industrial diseases I have se over 150 mule-spinners with epithelioma of the skin doubtful, early curable, and hopelessly neglected stat Visits to cotton mills, conversations with several hundr men and women spinners over 50 years of age whom have examined for pensions, and many talks with er ployers and representatives of the workers' Associatio have given me some practical knowledge of cotto spinning. Frequent visits to the Manchester Canc Research Laboratories kept me informed on the exper mental side of the problem. With such exceptional oppo tunities for doing so, I have formed certain conclusions o the causes of the disease and on measures which,



A mule-spinner at work.

systematically adopted by masters and men for its prevention or early recognition and treatment, would greatly diminish its dangers if not avert its onset altogether.

Incidence of the Disease.—Southam and Wilson in 1922 drew attention to the frequent occurrence of the disease, and the numbers of cases notified since then to the Medical Inspector of Factories have been recorded in his Annual Reports from 1923. During the seventeen years ending 1939 its average annual incidence was 64 cases with 21 deaths. In 1939 there were 52 cases with 20 deaths, and as medical referee I saw 16 cases last year. The continuing incidence of a preventable disease is very disappointing

Seat of Election of Scrotal Cancer

Mule-spinners work in bare feet on a wooden floor saturated with oil. They are constantly walking to and fro along the front of the machine, leaning well over but not actually against its front bar, whilst the carriage is moving outwards towards them, in order to join up very rapidly, piece, broken ends of the yarn. This is almost invariably done with the thumb and finger of the left hand. In most men the bar is on a level with the pubis and groins, and above the scrotum. In the hot room the spinners, in addi

and overalls only, perspire freely, and this must tend to wash off the natural grease of the skin and allow the oil to get on it.

Over 80% of cases occur on the left side. This may be due to one or more of the following causes:

1. The left side hangs anatomically lower than the right. This will be more pronounced when the spinner, in bending forward to piece with his left hand, stands on the left leg, sometimes on his toes, and balances with the right shoulder well above the left. The pelvis is correspondingly tilted.

2. Perspiration from the lower part of the abdomen may therefore tend to run down the left side of the scrotum more than the right.

3. The left side and, less often, the middle of the scrotum will come in contact with the left thigh and the oily trousers some hundreds of times a day.

Piecing with the right hand may, in the same way, be the cause of the trouble on the right side.

Mineral Oil as a Cause of Skin Cancer

Mineral oil was known in the middle of the last century to be a cause of epithelioma of the skin in the paraffin and shale-oil industry. The first case in a mule-spinner was found in the Manchester Hospital records in 1887, thirty-five years after the introduction of shale oil for lubrication of cotton machinery (Henry, 1926). It was proved in 1922 to cause the disease when painted on the skin of mice (Leitch, 1922), and many observations since then have shown that oils from certain fields of origin are more carcinogenic than those from other sources.

Oil on the Clothes.—The spinner oils the spindles twice a day, and these, revolving many thousands of times a minute, throw off some oil on to the clothes in the earlier moments after starting. A little will get on the hands when the oil-can is used and refilled twice a day, and will probably be wiped off on the clothes about the hips to clean the fingers for piecing. In some mills a special attachment to the machine reduces the need for oiling the spindles to once a week. A heavier oil is used twice daily on the carriage and wheels of the mule, and there is a general weekly overhaul and cleaning. More oil will then get on the hands, arms, and clothes, and the face is quite likely to have a little smeared on it unintentionally during all this work. Dermatitis of the face produced by dust or liquids not uncommonly arises in this way.

Oil in the Atmosphere.—Dr. E. L. Middleton (1926) found a definite amount of oil in a fine state of division in the atmosphere of the mule-room, and the hotter the room and the nearer to the machine the more there is. Some of this oil will get on the face and bare arms of the mule-spinners. There was less oil in the rooms where the earlier processes for mule-spinning are carried out, and very little or none in the air of the rooms of a ring-spinning mill. The preliminary processes of all spinning are carried out in hot rooms; but the men wear more clothes about the groins and are not in such constant movement about their work, with tilting of the body and pull on the trousers, as mule-spinners are. They come into daily contact with mineral oils, but do not often suffer from epithelioma of the skin generally or of the scrotum in particular.

Heat and Perspiration.—These alone will not cause the disease. Coal-miners are remarkably free from it, and yet in some hot pits they work in shorts and clogs and perspire freely. Coal dust, unlike its combustion-product soot, does not contain tar, and is not itself a cancer-producing irritant to the skin. In the shale oil and paraffin industry work is carried out in the open—in some processes in very cold temperatures, even as low as zero—and perspiration is not excessive. Both these substances, however, are much more carcinogenic than the mineral oils now in use in the cotton trade, and probably need no contributory cause in producing the disease.

Friction of Clothes.—Dr. Robertson (1927), medical officer of health for Darwen, in 1926 endeavoured by very careful practical investigation to prove that scrotal cancer was caused by friction on the scrotum by the upward pull of the overalls or braces during the piecing movements of the body. The disease is unknown in the woollen industry, in which spinners piece with both hands at once without any tilt of the body. His observations were also directed to prove that very little, if any, oil was thrown from the rotating spindles, but he agreed that some got on the clothes during the general oiling of the machines. Dyes or stiffening materials that may be in overalls are in his opinion a source of irritation, but these will be removed in their early washings.

Ichthyosis.—After an examination of 400 spinners, L. Savatard formed the opinion that ichthyosis is an important aetiological factor in the causation of mule-spinner's cancer.

Want of Bodily-Cleanliness.—Some managers of mills who have given close attention to the subject are of the opinion that neglect of soap-and-water cleanliness is a definite factor in causation.

Skin Protectives.—The sebaceous-gland secretion is protective against the action of a mineral oil, and, in control mice, if washed off with soap and water before painting with oil epithelioma will develop more readily than in the unwashed skin. A mixture of lanolin and olive oil applied to the unwashed skin before the application of mineral oil prevents the development of dermatitis and epithelioma. This observation led Dr. Alexander Scott in 1930 to try such an ointment to protect the shale and paraffin workers in Scotland from dermatitis and epithelioma of the skin, to which they are very liable. He informs me that the protection it afforded has proved so satisfactory that a proprietary preparation for the same object is still regularly used by the men. A similar preparation is applied daily in other industries as a preventive of dermatitis due to dust or liquids. These proprietary substances are preferred because they are easier to wash off than a grease like lanolin. Protective application for the thousands of spinners in cotton mills is not practicable, but it could be adopted by those over 50 years of age or those with specially dry skins, of whom there are comparatively few at work.

Conclusions as to Causation

1. *The primary cause* of epithelioma of the skin in mule-spinners is undoubtedly mineral oil.

2. A predisposing cause is probably an abnormally dry skin, especially in older men.

3. Excessive perspiration, by washing off the natural protective grease, allows oil close access to the skin. This is especially likely to happen on the scrotum.

4. Irritation may arise from friction of trousers or overalls on the scrotum during the movements of the body for piecing broken ends some thousand times a day.

5. Want of reasonable use of soap and water may be an occasional cause.

Protective Measures

Regular periodical examination of spinners should be carried out by a medical man for the earliest appearance of an epithelioma, which may be merely a local ichthyotic thickening of the skin or like a simple papilloma or wart. A microscopical examination is often necessary to settle its exact nature. Any one of these early changes can be excised or be treated with radium or *x* rays with such

The advantages of this method are as follows: (1) the treatment is non-odorous, non-greasy, and non-messy; (2) the bed-clothes or underclothes are not stained; (3) it is not expensive—each case costs about a penny for a course of treatment; (4) treatment is standardized at two days' duration; (5) it dispenses with the trouble of having clothes disinfected, thereby avoiding hospital treatment; (6) recurrences are few; (7) supervision is unnecessary; (8) baths are unnecessary.

The disadvantage of the method is that some patients complain of a burning sensation in the region of the scrotum and penis after four or five applications. Three or four days after starting the treatment there may be a very mild excoriation of the affected area, particularly the scrotum, and a scaling and slight exudation of serum may appear. This, however, does not incapacitate the patient, and within a week it usually disappears without treatment. The complication is probably due to the strength of the solution. Since using a half-strength solution on a new series of cases the excoriation has been observed in a very much milder form in only 3 cases out of 50. This development was seen in 8 cases in Class A, 15 cases in Class B, and 12 cases in Class C. In spite of this complication patients frequently make such remarks as: "The best night's sleep for a fortnight"; "This should have been used years ago" (this patient was treated three times previously with sulphur ointment); and "Good stuff, this: it does stop the itching."

I should like to express my thanks to Lieut.-Colonel J. F. W. Meenan, R.A.M.C., whose patience and kindly encouragement have contributed towards the completion of the above investigations. To Lance-Corporal A. Murdoch, R.A.M.C., my gratitude is due for his careful help, which has greatly assisted me in compiling these results.

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SUBCUTANEOUS LIGATURE OF VARICOSE VEINS

BY

H. S. RUSSELL, M.D., B.Sc.

The ability to treat varicose veins by injection of sclerosing solutions is now an accepted part of a practitioner's therapeutic equipment. Unfortunately there are many cases which need something more drastic than injection alone. A positive Trendelenburg sign usually means that ligature of the saphenous vein will be required, either in the thigh or at the saphenous opening.

The methods described by recent writers are not applicable widely enough, as they require the use of an operating heatre, and many patients are unable to stay away from their work in order to attend hospital. For some time I have been trying to evolve a technique which would allow ligature of a varicose vein to be performed with a minimum of complication in the consulting-room. The method now used will be described.

Method of Ligature

The instruments required are one 2-c.cm. syringe, one perineal needle, strong silk or silkworm-gut, 2% novocain solution, and sclerosing solution as preferred (5% sodium morrhuate solution in my own case). The patient usually sits, but occasionally a standing position allows the vein to be found more easily. At the highest point where the vein can be clearly defined the skin is prepared and an intradermal injection of 0.2 c.cm. of novocain is made on each side of the vein. The wheals should be one to one and a half inches apart. The perineum needle threaded with silkworm-gut is now passed through one wheal, under the vein, and out through the other wheal. In some of the early cases the vein was accidentally transfixed, but this appears to be of little consequence apart from the bruising that results. If this mishap is suspected the needle should be left in position until the rest of the treatment has been completed. Transfixion of the vein can be easily avoided by inserting the needle for an inch or so in a direction parallel to that of the vein, and then changing the direction across the course of the vein. The suture is drawn through and the ends are left loose.

A sclerosing injection is now made at the level of the suture, the ends of which are then tied firmly over a tightly rolled pad of gauze. In the earlier cases rubber tubing was used instead of gauze, but the increased elasticity caused the ligature to cut through the skin and leave a scar. A strip of elastoplast is applied over the gauze pad. The whole operation takes about two minutes to complete. The veins below the ligature require injection also, but quite small amounts of sclerosing solution will suffice, as the downward current of blood has been checked. These additional injections can be left over until the stitch is removed, which is done on the fourth day.

After tying the ligature it is pleasing to demonstrate that the vein is now empty. This can be done by getting the patient to contract and relax his calf muscle several times or, more simply, by "milking" the vein downwards. The demonstration is quite effective if the case is a suitable one for the method.

Results

The first case was treated eighteen months ago and the result is still good. Most of the patients have been able to work during the period of treatment. They are well pleased with the result, and there is no scar. Out of a total of nearly 30 patients 3 have returned later to have the other leg treated in the same way. The majority of the patients had either been refused injection treatment elsewhere because of the large size of their veins or had been treated unsuccessfully. It should be more generally recognized that injecting sclerosing solution into a vein which contains blood under pressure will not cure the condition, and may produce an area of pigmentation, thus bringing the whole method into disrepute.

There was one partial failure in the series. In this case I could not define the vein above the knee and had to tie it at a point where venous pressure was fairly high. The vein became patent again in a few weeks, though in the interval large veins below the point of ligature were successfully sclerosed. This man had previously had his leg treated at several hospitals and is pleased with the result, but I regard it as a failure. He ought to have had the Trendelenburg operation.

The most satisfactory case was that of a woman aged 40, who had had bilateral varicose veins for twenty years. They were rather larger in diameter than the average thumb, and extended to the middle of the thigh. Subcutaneous ligature in both thighs and half a dozen injections have produced a perfect cosmetic result. After six months there are still a few tender nodules at the sites of large varicose dilatations, but her ulcer has healed, her legs look normal, and she can walk as far as she likes without trouble.

Complications.—One ulcer developed at the site of ligature. In this case the patient did not attend as instructed

for removal of his ligature, but allowed it to remain *in situ* for a fortnight. Where very large veins are tied a certain amount of periphlebitis occurs. I have seen no harm come of it, and an elastoplast bandage gives complete relief.

Summary

A simple and effective method of ligaturing varicose veins is described. No special apparatus or facilities are required, and no scar is produced.

Clinical Memoranda

Acute Crush Injury of Leg

In the case here reported there were delayed symptoms suggesting traumatic thrombophlebitis, followed by shock and, later, by renal insufficiency. It was successfully treated at the patient's home by four "elastoplast" bandages and two crêpe bandages.

CASE HISTORY

An A.F.S. man aged 41 was driving a motor-cycle combination while looking for incendiary bombs when he was suddenly struck by the off-side wing of a car driven by another A.F.S. man on similar duty. The former was wearing thigh-length rubberized gaiters, long stockings, socks, and strong boots. The inner side of his knee broke the gear lever and deeply indented the petrol tank. The inner side of his leg was crushed against the engine, and his boot broke the starting handle. He was taken to the casualty department of a hospital, but was sent home because he felt fairly well and had only a few abrasions.

First Day.—He complained of shooting pains extending from the inner side of the right ankle to the upper limit of the internal saphenous vein, a feeling of great heaviness, and a burning sensation on the surface of the skin. There was also numbness like that of a swollen finger when its base has been constricted. He was beginning to suffer from shock; his pulse was 120. There was gravitational staining of the skin of the thigh and buttock very much like the post-mortem variety. The leg was twice the circumference of the other and pitted on pressure. The skin below the knee was tense, glazed, and dull red. The posterior tibial veins had become superficial, enlarged, tortuous, tender, and firm as if thrombosis had occurred. This applied in lesser degree to the internal saphenous vein. There was a wheal 3 inches in length above the right knee, and a number of smaller ones, varying from 1/2 to 1¼ inches, on the inner side of the leg below the knee. Over these extended several superficial abrasions which had faintly yellow sloughing bases. The veins below the knee were in contact with the surface of the wheals, and through the latter, elsewhere lacerations in the superficial and deep fascia could be palpated, and dark blood could be pressed to the surface from injured muscle fibres and deep veins. The shock was treated, and hot Gamgee fomentations were applied hourly to the whole leg.

Second Day.—He had an anxious expression and had begun to vomit. The pulse was slow and full, and the little urine passed was dark brown and scanty. The fomentations had given the leg and abrasions a more healthy colour, but the limb was more tense. A little black blood had appeared on the Gamgee tissue. Wool was placed round the knee and ankle and an elastoplast bandage was applied from the toes to the knee and another, in continuity, to the upper limit of the saphenous vein. This was followed by two crêpe bandages, which were to be reapplied when they became slack.

Third Day.—There was a great improvement. The vomiting had ceased and there had been a larger flow of urine, which was of a much better colour. The circumference of the leg was considerably smaller, and two more elastoplast bandages were applied, followed by two crêpe bandages.

The patient was up in five weeks, when he complained of pain under the gluteus maximus. An elastic bandage was tried but proved uncomfortable, so the adhesive variety was again applied. A month later he returned to light duty wearing crêpe bandages.

Pathology.—The elastoplast bandages repaired the subcutaneous tears in the ilio-tibial band and the fascial planes, restored the normal circulation of the blood and lymphatics and through them the metabolic health of the muscles, and emptied and prevented the formation of pockets of blood clot whose autolysis under pressure and patchy necrosis were possibly responsible for the glomerular nephritis.

His legs had been healthy before the accident, and there was no family history of varicose veins. His weight had previously been stationary at 12 st. 7 lb.; two months after the accident it was 10 st. 2 lb.

L. C. LODGE, M.R.C.S., L.R.C.P.

Local Sulphanilamide for Penetrating Wounds of Joints

In view of the increasing use of local applications of sulphanilamide it may be of some interest to record the following cases of wounds involving the knee-joint.

Case 1.—A spinster aged 58 was admitted to hospital as an air-raid casualty with an extensive third-degree burn of the buttocks and a gross laceration of the right knee. She was very shocked, but improved after a blood transfusion. It was not until ten hours after admission that she was fit for operation: it was then found that an irregular wound six inches long on the inner side of the knee communicated with the interior of the joint through a deficiency in the capsule, two inches long, beneath the patella. The wound had been temporarily packed with flavine gauze, but was extremely dirty, containing brick dust and fragments of clothing. As much contaminated tissue as possible was excised, the wound was irrigated with flavine solution and packed liberally with sulphanilamide powder, and the skin was lightly sutured. The leg was placed in plaster. The burns were treated with tannic acid. The patient was ill for the next few days, and a course of sulphapyridine was given by mouth, after which she gradually improved. The plaster was removed after three weeks; the greater part of the wound had healed by first intention, and the remainder was granulating well. There had been only a slight discharge of inoffensive pus. There was a little movement of the joint. The wound was again dressed with sulphanilamide powder and the plaster renewed. The plaster was removed permanently after a further three weeks, and at the end of eight weeks the wound was quite healed and there was painless movement at the knee to 35 degrees. The burn was granulating and will need skin-grafting.

Case 2.—A child aged 6 was knocked down by a lorry and was admitted to hospital with a dirty lacerated wound nine inches long on the inner side of the right knee crossing to the lateral side in front of the patellar ligament. At operation it was apparent that a large flap of skin and superficial fascia had been raised and that there was a deficiency 2 cm. in diameter in the capsule of the knee-joint on the *lateral* side of the knee. The tissues contaminated with road dirt were excised as thoroughly as possible (this was unsatisfactory on account of the thinness of the flap) and the wound was packed with sulphanilamide powder and lightly sutured. The leg was placed in plaster after a small counter-incision had been made for drainage through the base of the skin flap on the outer side of the knee. Convalescence was uneventful, and when the plaster was removed seventeen days later the wound was found to be well healed. Four weeks after the accident there was a full range of painless movement in the knee, and the child walked and ran without a limp.

It is not always possible to excise all the contaminated tissue of a wound without making an excessive sacrifice of skin. In each case there was a penetrating wound of the knee-joint in a contaminated wound: in neither case was an effective débridement possible, and in neither case was there any evidence of infection developing in the joint. In the light of these and similar cases it seems that the topical application of sulphanilamide powder to dirty wounds marks a considerable advance in treatment, especially when combined with the well-established principles of surgical toilet and immobilization.

I am indebted to Mr. R. Ledge for permission to publish these cases.

B. J. BICKFORD, M.B., F.R.C.S.

Reviews

PRACTICAL OBSTETRICS

A Short Textbook of Midwifery. By G. F. Gibberd, M.B., M.S., F.R.C.S., F.R.C.O.G. Second edition. (Pp. 548; 194 illustrations. 18s.) London: J. and A. Churchill, Ltd. 1941.

The second edition of this book is sure of a warm welcome. It is no easy task to write a short textbook upon any branch of medicine, but the author appears to possess just those qualifications which are indispensable to success. He has complete command of his subject, including the latest advances; he can be at the same time both lucid and concise, but is never betrayed into prolixity; his choice of subjects for fuller exposition is barely open to criticism; and he does not fall into the error, common among "short" writers, of relying upon illustrations to amplify scanty textual descriptions. In short, Mr. Gibberd's book is an outstanding success. The undergraduate will be delighted because from it he can readily and pleasantly absorb nearly all that he requires for the ordeal of the examination table. The practitioner interested in midwifery but unable to devote much time to current periodical literature will be kept well abreast of the stream of obstetric progress.

Writers of short textbooks can seldom find space for full consideration of recondite subjects, but Mr. Gibberd has managed to slip in a detailed account of the toxaemias of pregnancy. The thoughtful independence which characterizes all his work is conspicuous in this section. In considering the aetiology of hyperemesis he comes to the conclusion that "it is caused by pregnancy; beyond that it would be imprudent to dogmatize." In regard to the whole group of conditions conventionally named "the toxaemias" he remarks that "they have two things in common—that is, they are peculiar to pregnant women and their aetiology is obscure." After this flat refusal to gratify the reader's natural desire for speculative elucidation he proceeds to give him something else to think about in the form of a close description of morbid anatomy and clinical phenomena. The story is completed by a practical and selective account of the more promising lines of treatment, during which the student will be able to relight his pipe. Although when discussing aetiology the author gives the impression of a wary traveller picking his way through a bog, when it comes to treatment he is on terra firma with a clear sky above. He is seldom in doubt as to the best line to take, and he makes it clear that what he recommends he has himself tested and tried out.

Another subject in which the author's personal interest is well known is that of puerperal infection, which receives the full consideration commensurate with its importance. Particularly useful is the discussion of chemotherapeutic methods of treatment. Knowledge of the risks attendant on the use of sulphur compounds has lagged far behind the enthusiasm created by the first stories of their success in the treatment of puerperal infections. These risks are fully explained, and the need for close observation of the condition of the blood is forcibly impressed upon the reader.

On the whole Mr. Gibberd has shown discriminating judgment in the utilization of his limited space. It is worthy of remark, however, that while he declines to describe the details of the Zondek-Aschheim and Friedman biological tests for pregnancy on the ground that "the details are unimportant to the clinician," he devotes several pages to the ingenious models which purport to "explain" the movement of internal rotation of the head. One is tempted to ask him, Does it matter a brass farthing to the clinician what causes this movement?

WORDS OF WISDOM

Practical Public Health Problems. By Sir William Savage, B.Sc., M.D. (Pp. 198. 10s. 6d.) London: J. and A. Churchill, Ltd. 1941.

When a county medical officer of wide experience decides, after putting off the major burden of his office, to utilize his comparative leisure by placing on record some of the views which have served him to direct his policy, we are as a matter of course respectfully interested. But when, for the purpose of these records, with the whole realm of public health to choose from, he elects to narrow down upon the field of environmental hygiene, we are at the first impression respectfully surprised as well. And yet on maturer reflection there may be reason enough. The subject is one upon which the opinions of an acknowledged expert are indeed of special importance at this time, for the modern medical officer of recent growth, by reason of his inevitable addiction to the social aspects of his work, is often too little informed regarding environmental hygiene, and would—or should—sincerely appreciate words of wisdom pronounced regarding it by one who can speak with high authority.

Such thoughts as these are suggested by reading the work entitled *Practical Public Health Problems,* in which many such problems are agreeably presented, ably discussed, and in the majority of cases most satisfactorily solved, by Sir William Savage. Here are some of the views which he expresses. In connexion with water supply he says that in shallow surface waters warmed by the sun a considerable coliform count does not necessarily imply danger to the consumer. He does not believe that sewage-contaminated streams, if drunk by cattle, can set up disease in them. Having himself conducted research upon effluents from creameries, he stresses their harmful effect upon river water, since milk and whey are each 150 times as detrimental as ordinary sewage. Referring to the examination of water samples he holds the opinion that it is always the business of the field worker to interpret the laboratory findings, and not to seek to devolve his responsibilities on a chemist or bacteriologist.

The author gives precise directions for disinfecting a cowshed after tuberculosis. He tells how to run a milk-pasteurization plant. He considers that the failure to sterilize utensils at dairies is the commonest factor in the production of high bacterial counts. To effect improvement in the bacterial standards of the milks supplied in a district a persistent drive against the worst offenders is, to his mind, the best plan. In the investigation of outbreaks of food poisoning, so soon as any source has come under suspicion he advises that the inspector should "race" unheralded to the premises, which may be a place of business, before the manager has had time to destroy the incriminatory evidence!

Other articles are those on food canning, housing inspection, and disinfection. They also are informative and carry conviction. The whole book will be found to possess a guiding value for medical officers as well as for sanitary inspectors, to all of whom it is cordially recommended.

ANXIETY AND ALCOHOLISM

Anxiety and its Treatment: with Special Reference to Alcoholism. By John Yerbury Dent. (Pp. 124. 3s. 6d. net.) London: John Murray. 1941.

Dr. Dent has some very sensible things to say about anxiety, especially in relation to alcoholism. His explanation of anxiety may be paraphrased thus. Every chan-

in a man's environment has to be met by some change in himself. The human machine maintains its precarious balance by two main reactions: attack or retreat. When the mechanism does not react as a whole in one of these ways there is friction and consequent inefficiency, or alternation of behaviour. This constitutes "anxiety." To be or not to be, that is the anxiety. Man's fore-brain, which is so much larger than that of any other animal, enables him to remember and to learn from experience. His hind-brain closely resembles that of other animals; its task is to react to stimuli, but the fore-brain inhibits this reaction while the nervous impulse is travelling through all the connexions that have been made by past experience. The hind-brain says "Leap," the fore-brain says "Look before you leap." Worry is only possible when there is a problem to be solved, a decision to be taken: it depends on the ability to see two sides of a question. Therefore man worries more than any other animal just because of his superior intelligence. A man who is considered well balanced has a satisfactory balance between his animal and human brains. Lack of such balance is apt to lead him to resort to a fore-brain sedative, but the more the fore-brain is drugged the more drug it requires. When anyone runs away from any discomfort the more acutely conscious he becomes of that discomfort. The alcoholic addict is one who does not face life without continual or intermittent resort to alcohol. He drinks to calm his anxiety, and a temporary relief is bought at no matter what price. Here we may remark in parenthesis that men and women are said to drink for different reasons: the man to convince himself he is a finer fellow than he is, and therefore he drinks in company; the woman to drown her self-pity, so she drinks in secret. Of recent years the "fine-fellow" complex has affected many younger women, but it remains true that all alcoholic addiction is an attempted escape from reality.

Dr. Dent is a convinced believer in the efficacy of treatment by apomorphine for alcoholic addiction. He adduces theoretical considerations and practical experience for his convictions, and gives full details of his treatment. On his own showing, however, the underlying psychological state will require attention after release from addiction, but with that he is less concerned in the present book. Nevertheless, he concludes with a very helpful chapter on "blitzkrieg nerves," and the whole work is interesting, practical, and, at the present moment, topical.

THE PROBLEM OF PAIN

The Problem of Pain. By C. S. Lewis, M.A., Fellow of Magdalen College, Oxford. (Pp. 148. 3s. 6d. net.) The Christian Challenge Series. London: The Centenary Press. 1941.

Mr. C. S. Lewis is rapidly acquiring a leading position among those writers who are trying to restate Christian dogma in modern terms—which is quite distinct from the "modernist" attitude. The problem of pain is of interest both to the medical man and to the theologian; they approach it, however, from very different standpoints. The former regards pain as something which it is his duty to relieve, the latter as something to be sublimated and reconciled with the conception of a benign omnipotence. Truth to tell, this book is more about the larger problem of evil in general, pain being regarded as the "only sterilized or disinfected evil," as distinct from intellectual evil or error. In the author's view pain is for the purpose of shattering our illusion of self-sufficiency, and his experience in the last war leads him to say, "I have seen great beauty of spirit in some who were great sufferers," while candidly admitting, "I have never for a moment been in a state of mind to which even the imagination of serious pain was less than intolerable."—Without depreciating in any way the deep sincerity and originality of thought which mark this book, as they do Mr. Lewis's other writings, we doubt whether it would be very helpful to the physician and his special problems. A brief appendix by Dr. Havard is much to the point, stressing the absence of after-effects from short, severe physical pain, compared with the deterioration of character which may result from long-continued pain. He concludes: "Pain provides an opportunity for heroism: the opportunity is seized with surprising frequency."

Notes on Books

A fifth edition of *Aids to Medical Diagnosis*, by the late Dr. A. J. WHITING and Dr. FREDERICK SUTTON, has been published by Baillière, Tindall and Cox at 4s. 6d. This book shows the characteristic virtues and vices of a certain type of registrar teaching. Its virtues are that it helps the student to organize his knowledge and write answers to examination questions; its vices, that it almost completely neglects the physiology and natural history of disease, and teaches from the textbook rather than the patient. We are prepared to believe that some students may be better able to pass their finals by classifying diseases of the heart into conditions in which the apex is, or is not, out, with or without superadded sounds, but it is not our idea of the proper approach to the cardiac patient. We note an excessive fondness for eponyms; few consulting physicians could define Nothnagel's syndrome, which is here mentioned, and few students are likely to meet it. There is a similar weakness for tabulated lists, but while the majority are almost pluperfect, there is a sly pleasure in finding that acute mononucleosis is missing from the differential diagnosis of diphtheria, and jaundice and prothrombin deficiency from the haemorrhagic states. It would be unfair, however, to bring heavy guns into action against this little cruiser. We can well imagine that the vade mecum will have its friends and that their gratitude will repay Dr. Sutton for the pains he has taken in rewriting it.

In our review of the first edition of Mr. LINDSAY REA'S *Neuro-ophthalmology* it was pointed out that the author had collected a mass of useful information that is not easily accessible in the systematized literature. The present edition (William Heinemann, 50s.) is a reprint of the previous edition with the addition of a hundred or so pages summarizing work published during the last few years: the additional material is arranged in chapters that are supplementary to those in the body of the text. As with the main text, the supplement shows the author's acquaintance with the scattered literature, but the matter is presented in a manner which is not conducive to a clear exposition. The present volume is still an uncritical summary of a wide literature and lacks conciseness and stress on fundamental conceptions. Its value as a guide to the literature is, however, considerable.

Volume lx of the *Transactions of the Ophthalmological Society of the United Kingdom* has been published by J. and A. Churchill, Ltd., at 30s. The main topics for discussion at the sixtieth session, held in London in April, 1940, were the choice of operation in glaucoma, the anatomy of the finer retinal vessels, diseases of the lacrimal apparatus, tarsectomy for trachoma; there were also a number of miscellaneous papers and descriptions of ophthalmological apparatus, and Mr. Montague Hine gave an account of some of the happenings and problems of the preceding six months as seen at an emergency ophthalmic base. The volume includes brief reports from those of the affiliated societies which were functioning in the first year of the war.

Materia Medica and Pharmacology for Nurses, by Mrs. GWENDOLEN HUGHES, M.Sc., gives a short and simple account of the subject. The author has managed to cover a very wide field in the short space of 160 pages and has maintained a very creditable standard of accuracy. The book is published at 4s. 6d. by Faber and Faber, Ltd.

Principal Drugs and their Uses, by A. L. MORTON (tenth edition, Faber and Faber, Ltd., 2s. 6d.), is a pocket volume intended for the use of nurses. All drugs in common employment are listed in alphabetical order and the composition and uses of each are stated in a few lines. Inspection of the volume shows that care has been taken to keep it up to date. The number of editions through which the book has passed proves that it meets a general need.

The seventh edition of JOSLIN'S book, *The Treatment of Diabetes Mellitus*, has been thoroughly revised and brings the subject right up to date—no easy task. A new section on hyperinsulinism is included. The book, though of less help in routine treatment, remains the best and most comprehensive reference work of books on the subject and must be on the bookshelf of all who work on diabetes. It is published by Kimpton at 35s.

Preparations and Appliances

EQUIPMENT OF A MOBILE UNIT

Dr. HAROLD C. J BALL, Medical Officer, Mobile Unit, New Milton, Hants, writes:

The equipment of the New Milton Mobile Unit not only incorporates one or two devices which have been described in the *Journal* during the last few months but also includes original apparatus for the administration at the site of an incident of radiant heat to patients suffering from shock. The following notes and especially the illustrations of radiant heat cradles may therefore be of interest to other medical officers of mobile units.

First, the general equipment—dressings, splints, instruments, anaesthetics, drugs, etc.—is contained in seven cupboards which are kept at the depot ready for action locally; they are easily packed into the mobile unit van within five minutes should our services be needed in an outlying district. Sterilized dressings are always in readiness in case local hospital or transport facilities fail. In addition we have a portable operating table which has been lent to us.

In our oxygen therapy apparatus we have copied that described by Dr. Marcus Bird in the *Journal* of September 21, 1940 (p. 387). The cost of this was negligible since we made use of copper tubing obtained from a car "dump" and quart milk bottles, and adapted old head-mirror bands and fittings for nasal administration. Besides four nasal attachments we have two old football bladders for use with gas masks, as suggested by Dr. H. L. Marriott (*Journal*, October 19, 1940, p. 519), all necessary pressure being controlled by gas taps. Stretchers in the unit are fitted with the inexpensive, light though rigid, support for a Fowler position which I described in the *Journal* of November 2 (p. 610).

For the treatment of patients suffering from shock we have designed radiant heat cradles which are illustrated (Figs. 1-4). Here again the outlay has been small, for they are each constructed of half-sections of a child's hoop and Essex boarding. The heat is supplied by electric lamps, or, alternatively, since electricity may fail in an emergency, from a primus stove; square and round biscuit and sweet tins and boxes of Essex boarding are used to connect the primus stove with each pair of cradles. Control of heat is regulated by sliding shutters and a central overhead outlet. The whole is easily moved to and from the stretchers; moreover, stretchers and cradles can be set up in the open by resting the stretchers on equipment cupboards or other available supports.

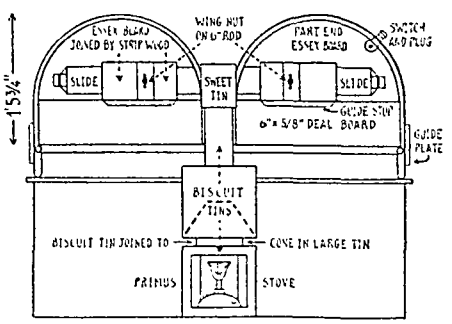


FIG 1.

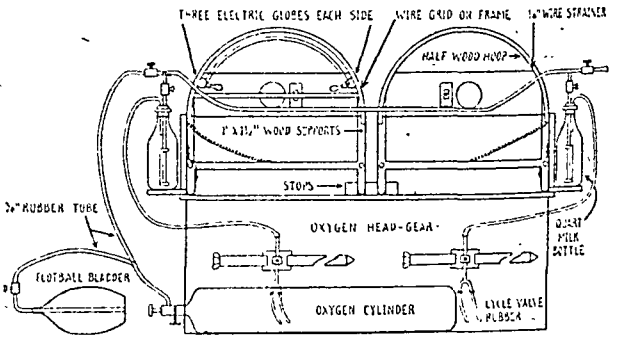


FIG. 2.

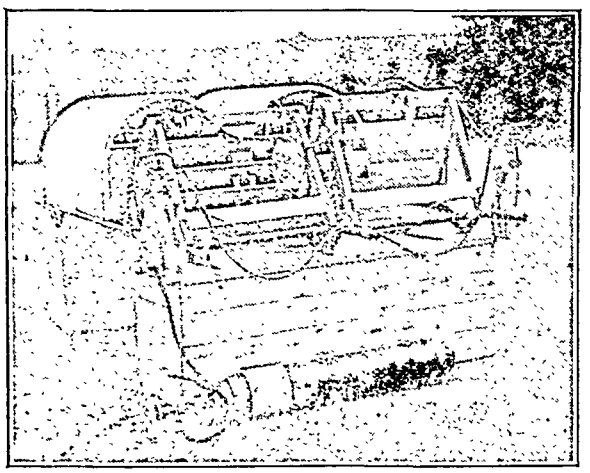


FIG. 3.

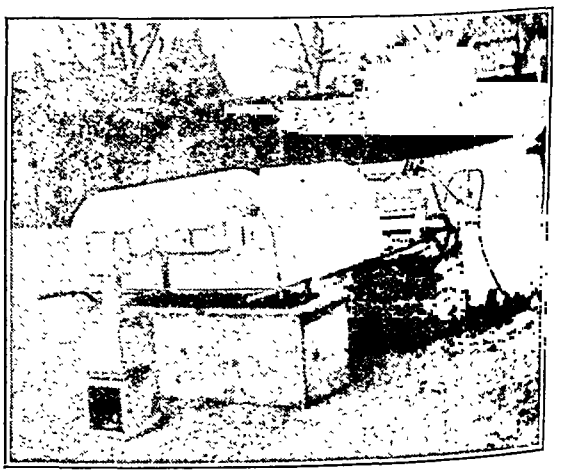


FIG. 4.

We are indebted to Mr. R. J. Stewart of the New Milton St. John Ambulance Brigade for making the cradles, oxygen therapy apparatus, and back rests to the stretchers.

SOME OF THE PRODUCTS OF

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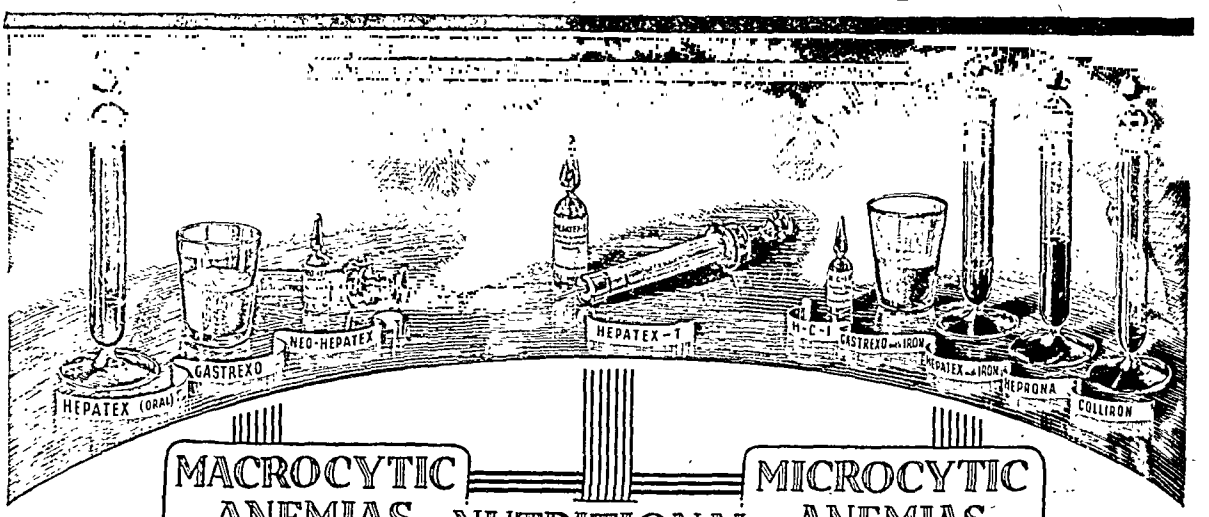
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BRITISH MEDICAL JOURNAL

LONDON

SATURDAY APRIL 26 1941

SCOTLAND DESERVES BETTER SOCIAL LEGISLATION

There was a time when Scotland took a pride in the advanced state of her laws governing public welfare. Legislation often followed the English statutes on the same subject; it took advantage of the extra time to avoid some of their defects, and to introduce improvements which working experience had shown to be desirable. This was true of the Scottish Public Health Act of 1897, which derived its main features from the great English Act of 1875; and to a less extent of the Poor Law Act of 1845. In some aspects of social legislation Scotland took the lead from the start: one need only mention, by way of illustration, the lunacy laws of the middle of last century which in Scotland encouraged the admission to mental hospitals of voluntary and temporary patients without the stigma of certification. This benefit did not reach the English statute book till 1930. The Scottish Act of 1845 was more humane than the famous Poor Law (Amendment) Act of 1834, for it did not insist on the rigid "workhouse test." This piece of kindliness, which was no doubt in keeping with the Scottish tradition and the long association of poor relief with the kirk, had unfortunate consequences which could not have been foreseen at the time. Under Chadwick and his brethren the harsh "offer of the house" to persons applying for relief compelled the authorities to build workhouses. These in the course of time developed into hospitals, because they had to cater more and more for the chronic sick, the aged, and the infirm. The old mixed workhouse was a miserable thing, but progressive Boards of Guardians transformed many of them into institutions which could fairly compete with the voluntary hospitals in their neighbourhood.

When the Local Government Act, 1929, came into operation the new English authorities—the county and county borough councils—found themselves in possession of large numbers of Poor Law institutions. Some of these were ready-made first-line hospitals; others were capable of being enlarged, modernized, and "graded up" to form good hospitals at relatively little expense; and all but the worst had some value, because they could be used for a health purpose, such as the residential care of the chronic sick. In Scotland, unfortunately, few Poor Law institutions had been built at all, except in the larger towns, and fewer still were fit to be brought up to a reasonable hospital standard. For this reason the report of the Committee on Scottish Health Services had to confess in 1936 that there was a serious shortage of hospital beds in the country. "It militates against the ideal of early treatment," they reported, "and, in its effects among the working population, it causes much loss of working time and avoidable expenditure from insurance and other funds." In these circumstances it was to be expected that Scottish legislation would be quick to promote hospital construction and so redress the balance. But not so: although the committee recommended that a definite obligation should be placed on the local authorities to supplement existing hospital facilities if required by the central department to do so, little progress was made until war broke out. The evidence suggests that the fault did not lie with the local authorities but rather with the state of the law. However that may be, the outbreak of war disclosed such an acute shortage of hospital beds that the Department was obliged to build *ad hoc* hospitals for the reception of casualties.

Several factors have combined to retard the development of municipal hospitals in Scotland. The Scottish Local Government Act of 1929 was passed at the same time as its English brother, so Scotland lost its usual opportunity of profiting from the defects of the English statute; in fact, it introduced some faults of its own. A somewhat cumbrous section (27), corresponding with Section 5 of the English Act, enables local authorities to make a scheme for reorganizing their hospital facilities. As in England, the section has been little used, except in the cities. It is only a few weeks since the Corporation of Glasgow, apparently losing hope of more progressive legislation, took this first step in the removal of the institutional care of the sick from the Poor Law. Many authorities in England, however, were able to make use of a satisfactory alternative procedure to bring their institutions under public health administration, by the method of "appropriation"; this was already permissible under Section 95 of the Public Health Acts Amendment Act, 1907, and was extended to county councils by Section 163 of the Local Government Act, 1933. This important provision has been widely used in England, and under its aegis many public assistance institutions have become first-class hospitals.

If this were the only respect in which Scotland lags behind its neighbour in social legislation the position would not be so serious; but the English Public Health Act of 1936 gives large powers to local authorities to provide hospitals and allied services, including clinics and dispensaries, out-patient departments, maternity homes, laboratories, and ambulances. These admirable provisions have no counterpart in Scottish law, and Glasgow, in spite of its recent progress, is still under many disabilities. It has no authority to provide clinics apart from hospitals, and it is greatly hampered in the treatment of non-tuberculous crippling defects. The limitations are serious, and the remedy is simple. It may not be desirable at the moment to introduce an entire Public Health Act for Scotland, but surely the time has come when the two countries should be placed on an equal footing in the treatment of the sick and the crippled. The introduction of a few of the essential sections of the 1936 Act, with modifications to meet Scottish conditions, would not place a great strain on our legislators. Section 173, for example, which simplifies the provision for treatment and after-care of the tuberculous; Section 181, which empowers local authorities to provide hospital accommodation, including clinics, dispensaries, and out-patient departments; and Sections 196–8, with their commonsense powers to provide laboratories, ambulances, and post-

mortem rooms, were never more necessary than at the present time.

Scotland deserves better health legislation; if she is not allowed now to share equally with England she must inevitably suffer a severe handicap when the time comes for post-war reconstruction.

CARBOHYDRATES IN VARIOUS FOODS AND THEIR UTILIZATION

Until lately determination of the carbohydrate content of foodstuffs was in an imperfect state. The analytical methods were not of the best, and it is surprising that many writers on dietetics in health and disease were content to transcribe the values given by older workers. In this country the matter was taken up energetically by McCance and his colleagues, with the result that we have figures which are as reliable as modern analytical procedures can make them. In the U.S.A. the question is being examined again, and one or two recent papers are worthy of attention. Technical difficulties in obtaining reliable figures are considerable. Carbohydrates, for example of fruits and vegetables, have from the metabolic point of view been classified broadly as available and unavailable sources of energy. The available group includes the monosaccharides glucose and fructose, the disaccharide sucrose, and the polysaccharide starch. The unavailable group comprises hemicelluloses, cellulose, and lignin. Hemicelluloses comprise a group of polysaccharides, including pentosans, hexosans, pectins, uronic acids, etc., a large percentage of which can be hydrolysed to non-fermentable sugars. The chemistry of this group of substances is complicated. Cellulose is chemically a single substance and on hydrolysis gives glucose. Lignin (a complex substance of unknown composition) is contained in the supporting structure of plants and is present in small quantity in edible plants.

The analytical determination of the unavailable fraction is difficult, and the method described by Williams, Wicks, Bierman, and Olmsted[1] presents interesting features. They dried the macerated or sliced samples of fruit or vegetable in a hot-air oven at 60° C., pulverized the dried material, ether extracted and removed the soluble sugars (fructose, glucose, and sucrose) with 60% ethyl alcohol, and then estimated them iodometrically. The residue, consisting of starch and unavailable carbohydrate, was subjected to pancreatic digestion in buffered bile-salt solution at *p*H 8. This procedure converts the starch to maltose and renders the protein and fat non-interfering. The reducing power after yeast fermentation gives the figure for soluble hemicellulose. There remains an insoluble residue after pancreatic digestion which can be analysed into cellulose and water-insoluble hemicellulose. The values for available carbohydrate in the common fruits and vegetables thus found were very much of the same order as those given by McCance. The authors propose a classification of fruit and vegetables according to their carbohydrate content, but, as it was found that the older values for available carbohydrate were too high and for unavailable carbohydrate too low, there is much readjustment of the position of the individual foods. For those who still adhere to the prescriptions of diets for diabetics based on more or less accurate calculation of carbohydrate content it will be a source of satisfaction to see more fruits and vegetables in the lower-carbohydrate classes.

It was pointed out by McCance and his colleagues that cooking of certain foods leads to considerable losses in carbohydrate content, and that for such it is desirable to have figures for the foods as eaten. Carpenter,[2] in investigating the effect on carbohydrate metabolism of a variety of foods, carried out a comprehensive analysis of such things as rice, macaroni, potatoes, peas, parsnips, beets, carrots, various nuts, dates, and figs, with a view to determining water content, protein, fat, ash, carbohydrates (reducing sugars, disaccharides, starch, cellulose) in the conditions in which these foods were eaten (cooked or uncooked). The caloric values were determined in the oxy-calorimeter. Boiled rice, for example, can yield only 1 calorie per gramme, and white boiled potatoes rather less than this; boiled carrots or beets give only between 0.3 and 0.4 calorie per gramme. Nuts (high fatty content) of various kinds yielded from 7 to 9 calories per gramme, and dates and figs (very high proportion reducing sugars) nearly 3 calories. The available carbohydrate in various foods having been established, the effect of ingestion of a selected amount of each on the metabolism of a young healthy man was determined. The foods were given under basal conditions, so that what was really determined was the shift of metabolism from the particular basal levels of protein, fat, and carbohydrate to the new levels made possible by the availability of the constituents of the administered food. The constituent specially recorded was the carbohydrate, and the importance of the work lies in the demonstration that when the term "available carbohydrate" is used it should not be supposed that availability has any constant significance. First of all it was found that the mere ingestion of 250 c.cm. of water on three separate occasions raised the consumption of carbohydrate from basal levels of 7 to 11 grammes per three hours by as much as 6 grammes per three hours. It is not stated whether the water given was cold or hot, a point perhaps of some significance. As the amounts of the various articles of diet given in these experiments varied, comparable results for increased carbohydrate combustion were obtained by recalculating the latter for the case in which the amount of available carbohydrate would be 25 grammes. Applying this calculation, it was found that the rise in carbohydrate combustion during three hours for amounts of certain foods corresponding to 25 grammes available carbohydrate was no greater than would have been obtained with 250 c.cm. of water. Such foods were boiled rice, boiled macaroni, white raw potatoes, and nuts of various kinds. Boiled parsnips, beets, and carrots gave very marked increase in carbohydrate combustion in the three-hour period; white bread, dates, and figs gave increases of the same order. (It was found that, whereas raw carrots gave a greater rise than boiled carrots, the reverse was the case with white potatoes; this is perhaps explicable on mechanical grounds.) The time course of the rise in carbohydrate

[1] *J. Nutrit.*, 1940, **19**, 593

[2] *J. Nutrit.*, 1940, **19**, 415, 423.

combustion (determined at fifteen-minute intervals) showed that cane sugar or dates give a very sharp rise, but a rapid fall to pre-ingestion levels. Glucose gives a much smaller and less acute rise, but a higher level was maintained for a much longer time. Boiled beets, boiled parsnips, boiled and raw carrots, all combined large and acute increases with maintenance at elevated levels throughout the three hours of observation. Although the results obtained with these various foods are perhaps not unexpected, it is important that such experiments should be extended. The practitioner recommending a diet, most often qualitatively, should have a picture before him of availability of carbohydrate in foods based not only on the bare bones of chemical analysis but also on the actual availability to the organism when fed.

As to the so-called unavailable carbohydrates, the commonly held view has been that the human subject is unable to cope with them enzymatically and that their excretion is a matter for bowel action. But that in certain circumstances these unavailable carbohydrates can disappear from the alimentary tract is indicated by some recent work of Shepherd, Hummel, and Macy.[3] They point out that the digestibility or disappearance of fibre (that is, the part containing cellulose, hemicellulose, and lignin) from the digestive tract of man is very variable, and depends to some extent on its content of cellulose and hemicelluloses (lignin apparently not being digested at all) and upon the presence of bacteria in the alimentary tract. The authors studied the metabolism in children aged 5 to 8 years under controlled conditions for periods of thirty to fifty days. The daily diet was then altered. During the control periods the diet included 100 grammes of apple and 100 grammes of banana, or 200 grammes of apple only. During the experimental period 100 grammes of banana a day were added in one group; 100 grammes of banana were added and some bread and "cereal" removed in another; and in a third group 100 grammes of banana and a certain amount of potato, butter, and white bread were added. Adding banana to the diet increases its lignin content, and changes the quantities of both cellulose and hemicellulose in the gut; banana also increased the amount of pectin in the diet, and it is stated that this seems to have unique physiological value in stimulating better utilization and passage of intestinal contents, produces a more satisfactory buffer action, and effects a change in the bacterial flora in the faeces. The proportion of the cellulose and hemicelluloses in the diets was determined and an estimate made of the amount disappearing from the intestine. Thus of 112 mg. of cellulose per kilogramme of body weight in the control period of one group of children 81% disappeared, and of 119 mg. hemicellulose per kilogramme 63% disappeared. These percentages were maintained even after the daily addition of 100 grammes of banana. There was wide variation in the percentages disappearing in different individuals, and these are held to be characteristic and dependent upon the proportions of lignin, cellulose, and hemicellulose in the daily diet rather than upon the total amount of fibre ingested. Whether these very considerable disappearances of "unavailable" carbohydrate have any physiological significance is not clear, but the authors suggest that there may be a protein-sparing action and that the character of the fibre (that is, the ratio lignin:cellulose:hemicellulose) may have dietetic importance.

[3] *Amer. J. digest. Dis.*, 1940, 7, 248

PHYSICAL MEDICINE, ORTHOPAEDICS, AND THE SERVICES

The field of activity claimed by those who practise physical medicine has been cursed by many cumbrous names; moreover, the subject is not "understanded of the people," and little comprehended by the profession at large. There are adequate reasons for this. First, the methods used by those who specialize in it do not form a real part of the training of students: secondly, the apparatus employed lends itself all too often to a blatant form of quackery, thus spreading disrepute far and wide. Then, again, the majority of these methods are available, through the medium of medical auxiliaries, to practitioners by merely sending the patient "for massage" or "for electrical treatment," leaving the choice of method and technique to the trained—but not medically trained—technician. When such treatment gives good results the practitioner is apt to infer that technical knowledge on his part is superfluous and that the help of an expert colleague is even less necessary. Poor results are blamed on the apparatus used—whether ultra-violet light, short wave, or mobilizing exercises—without regard to the possibility that the method that has proved unsatisfactory might never have been employed in that way if experienced medical supervision had been invoked.

As a corollary to these facts there has arisen some dissension between the specialist in physical medicine and the orthopaedic surgeon. Orthopaedic surgeons have been heard to claim that they are capable of seeing their cases through from beginning to end, and that unless they can do so their results are handicapped or even completely marred by the "interference" of the physical medicine specialist. The consultant in physical medicine for his part has been heard to say that the orthopaedic surgeon makes no attempt to evaluate, in close collaboration with him, other methods, and that he, the orthopaedic surgeon, has inadequate knowledge of the various means employed in physical medicine. This disagreement between the two branches is unnecessary and hinders progress. A glance over the field of those who practise physical medicine, whether in spas, by expert prescription of massage and medical exercises, by occupational therapy, or by the more direct physical methods of electrical currents, will make it clear that their work is the medical counterpart of the orthopaedic surgeon's. If consultants in physical medicine were regarded as "orthopaedic physicians" their field of activity would become clear, and their function in relation not only to orthopaedic surgeons but to the whole medical profession would drop into its proper place and perspective. Their advice, special knowledge, and collaboration could be sought without fear of trespass or overlap. It is satisfactory, therefore, to note that the Director-General of Army Medical Services has realized the importance of this branch of practice by the appointment of a Consultant in Physical Medicine with the rank of a higher consulting officer. The duties attaching to this new post go further than advising and helping in the physical treatment of injured soldiers and convalescents. The Director-General has, wisely, looked to the knowledge of function and movement possessed by this adviser to help and guide him in the conditioning of recruits, especially those with physical handicaps who are amenable to intelligent re-education and remedial exercises. The consultant and his chosen team are available to help those whose special duty

it is to train the recruit forward into fitness and hardness. Here indeed is a means for joint work in preventive medicine and one that should promote close and warm liaison between our profession and the commanders in the field. With such an organization in effective operation the orthopaedic surgeon could feel assured not only that his results will not be marred, but that they will be improved, thus freeing him from anxieties about the final stages of treatment and enabling him to concentrate upon the vast surgical problems that already face him.

It will be interesting to watch the fruits of the new appointment and of the policy behind it, and see whether the other Services follow the lead given by the Army. A point to look out for, when the time comes to assess results, is whether this new move has practical value in active war areas also, especially in places such as the Middle East, where problems of evacuation are difficult and every man returned to the firing line means so much saving of time and transport. The appointment of a Consultant in Physical Medicine to the Army, with a well-defined field of activity, means also the freeing of his branch of work from radiology, and this should be welcomed by the radiologist, to whom physical medicine is a secondary subject with which he does not claim to be fully conversant. The movement towards giving a status of its own to physical medicine is in harmony with the opinion of a special committee of the British Medical Association, whose final report was under review, in consultation with Lord Dawson's medical committee of the National Physical Fitness Council, when war broke out.

TREATMENT OF SEVERE DIPHTHERIA

The war has given a great stimulus to preventive medicine, and as a result of well-directed propaganda active immunization of children against diphtheria has been carried out on a larger scale than would have been expected in peacetime. But still more effort is needed, and we should not rest satisfied until over 75% of the child population is protected against an infection that takes an annual death toll of some three thousand lives. Early treatment is vital for those who are infected; it is almost axiomatic that patients do not die if given enough antitoxin within twenty-four hours of the onset of the disease. Yet every superintendent of an isolation hospital can tell of admissions two, three, or more days after the onset of illness—or, for that matter, well after the first visit of the doctor. Antitoxin is often of no avail in these late cases, especially in those in which the *gravis* bacillus is present. Dr. O'Meara[1,2] and Dr. McSweeney[3] think there may be an explanation, and, what is more, a way of improving this situation. O'Meara believes, on the evidence, that most or perhaps all commercial antitoxin has a low "avidity" for diphtheria poison—that is, when it meets and unites with the diphtheria toxin in the tissues of the patient the bond of union is not a firm one and may be quickly or easily dissolved, thus allowing ordinary toxin as well as other poisonous principles not hitherto recognized to spread and overwhelm vulnerable tissues. McSweeney obtained from the Wellcome Laboratories some special antitoxin of conspicuously high "avidity," which he tells us contained an unusual amount of antibody or antitoxin to the second poisonous principle postulated by O'Meara. With this antitoxin McSweeney treated sixteen patients suffering from severe diphtheria—Grades 3 and 4. The death rate for these two grades has been 25% in Dublin in the past; in McSweeney's group it was 6.2%. Unfortunately the figures are very small; an arithmetical calculation would seem to indicate that if successive groups of sixteen patients in Grades 3 and 4 were treated with ordinary antitoxin, about one in each twenty groups would yield fifteen recoveries. It is true that this argument does not cover the whole ground, for McSweeney out of his long experience says that he has never before seen patients in Grades 3 and 4 show such happy progress—absence of cardiovascular failure, rapid clearing of throat, absence of albuminuria, few paralytic sequels, rapid disappearance of bull-neck, and absence of failure of blood pressure. Obviously he and others will make every effort to treat many more patients with similar antitoxin. Here an unfortunate difficulty arises, for McSweeney states that the avid serum he used was not produced by any special methods of immunization, or by any alteration of inoculation of horses based on the use of O'Meara's second toxin. McSweeney informs us that avid serum cannot be produced at will and supplies are not obtainable. The papers will attract much attention, and we shall have to wait for confirmation by O'Meara and others that *gravis* cultures from many centres will produce in guinea-pigs the picture of hypertoxic diphtheria described by him and that this can be cured by avid antitoxin. If further trials repeat the results presented by McSweeney there will remain to be discovered a method of producing avid antitoxin.

[1] *Lancet*, 1941, 1, 205.
[2] *British Medical Journal*, 1941, 1, 374.
[3] *Lancet*, 1941, 1, 208.

EMERGENCY LIGHTING AND POWER FOR HOSPITALS

The need for an emergency electrical generating set in hospitals has been forcibly illustrated since the air attacks on large cities began. Even if a hospital is not itself damaged its work may be seriously hindered when the main supply is interrupted. Economical automatic devices for stand-by equipment for lighting only have been mentioned in these columns, but to supply both power and light to a large institution is a much bigger problem and necessarily more expensive than fitting up an alternative plant for the lighting of a first-aid post, an operating theatre, or a control room. A medical man who can speak with authority on this subject, having visited a great many hospitals in different parts of the country, informs us that only a few hospitals have emergency generating sets. There are examples on the South Coast and in the Midlands. In these the set was installed primarily to supply the *x*-ray services and was inspired by the radiologist in charge, but as events have turned out it proved to be to the benefit—in one instance the salvation—of the entire hospital. These hospitals were damaged and the mains supply cut off, but the temporary set did excellent work and enabled the hospital to carry on. The energy-generating set in one of them consists of a 20-h.p. paraffin engine driving a 10-kilowatt three-phase 400-volt generator through a flex belt drive running at 400 revolutions per minute. The engine exhaust is led into an old chimney stack, and the cooling is brought about by means of two 250-gallon tanks of water and a circulating pump. The mains cable-ends from the meter are diverted from busbars—by which is meant the conductors on a switchboard to and from which the various circuits run—to a tripole change-over switch, and one side is fed back to the busbars and the other to the emergency set. The total cost of this installation—the set itself having been bought second-hand for £300—including the tanks and switches and the expense of installation was £360. The test of the

equipment came on a night when the town was heavily raided. The emergency set was in operation within ten minutes and maintained the necessary lighting of the hospital and working of the lifts, as well as serving the x-ray mobile unit and other plant. During the raid the hospital itself caught fire, and over a hundred patients had to be evacuated, a task which was only made possible by the working of the lifts. Much valuable equipment was also moved from parts of the building on fire, including most of the x-ray and operating theatre equipment, and this again was only possible by the emergency lighting and power provided. On subsequent occasions the lights failed, and each time the emergency set stood up to a heavy night's work, and kept things going until the mains came on again, in one case not until forty-eight hours after the first interruption. The same hospital also suffered from damaged water mains, but on the day following the raid the boilers, which are fired by electrically operated mechanical stokers, were started and fed from reserve water, and a temporary water supply was provided for the hospital, which enabled emergency treatment and (gas also not being available) cooking by steam to be carried on. The laundry at this hospital is electrically driven, and half of this could be used while the mains supply was out of action. The cost of the installation may make a hospital board hesitate, but it might prove to be an economy in the case of hospitals in vulnerable areas.

WARTIME STREET LIGHTING

A most excellent report on "Fundamental Requirements underlying the Wartime Street Lighting," prepared for the Joint Committee of the Ministry of Home Security and the Illuminating Engineering Society, is summarized in a recent issue of the *British Journal of Ophthalmology*.[1] Note is made of the amazing range of human vision according to the lighting, from summer sunlight to faint starlight, a range of about one hundred millions to one. Dim light presents serious difficulties owing to the sudden movements of persons from brightly lighted rooms, from exposure to lights in the outdoor dimness, and because of the peculiar reactions of the healthy retina to dim light. Small objects cannot be seen with certainty and colour cannot be distinguished. The value of the dim street lighting of 0.0002 foot-candle depends entirely on the avoidance of factors apt to depress visual acuity. Change from lighted interiors to out-of-doors should be slow. Light-traps, besides their primary object of preventing escape of light from within, have a secondary field of utility in providing a period of adaptation. The next step is to avoid the presence of objects of undue brightness outdoors. Car headlights and traffic signals of a value exceeding the minimum for recognition inevitably give rise to some degree of glare. There seems good ground for the adoption of a value of brightness of the order of 0.05 to 0.1 equivalent foot-candle as a limit in streets. These limits have been independently determined with a view to restricting conspicuousness from the air. Lights on refuges and obstructions frequently offend by their glare, making it difficult to see outlines of adjacent objects. The Lighting Order on these lights is much higher than the proposed limit. Pedestrian torches offend because of the concentrated beam; a box with no lens giving a larger light area of low but even brightness would be much better. Stress is laid upon the high value of large-size white painting of obstructions, of walls and railings at crossings, of the vertical surfaces of kerbs, and the white paint on motor vehicles. All should have a greater area of whitening than now usual. This would give the eyes of passengers a better chance of seeing them. Isolated bright spots of light, such as luminous crosses on islands or rear lights of cars, make it almost impossible for the road-user to see what is beyond them. Experience has shown the high value of a uniform level of illumination with, so far as possible, no region of complete darkness. The measure of illumination provided by wartime street lighting, though so small, is of appreciable benefit, especially when applied on a wide scale. In this issue of the *Journal* is a paper by Mr. Bishop Harman on testing night vision. His plan of seeing groups of white disks and counting them is based upon the reaction of the normal retina to dim light. It may enable pedestrians to be sorted out—the relatively safe and the unsafe.

[1] *Brit. J. Ophthal.*, March, 1941, p. 125.

AMERICAN DOCTORS FOR BRITAIN

President Roosevelt's latest interpretation of the phrase "all aid for Britain" in his call for 1,000 American doctors to volunteer for service in the R.A.M.C. and the E.M.S. in response to an appeal from Sir Philip Chetwode, chairman of the British Red Cross Society, will hearten members of the profession in the country, wherever their work lies. As was pointed out in a leading article in these columns a fortnight ago (April 12, p. 509), the effect of the increasing demands of the Services and of the E.M.S. has been to deplete general practice to such an extent as to endanger the health services available to the civil population. The need for more medical men is a pressing one, and Sir Philip Chetwode in his appeal stated that up to 1,000 were "required to assist both the military and civilian medical services." American doctors under 40 years of age are asked to volunteer for service with the R.A.M.C. and those under 45 for the E.M.S. All will, of course, retain their American citizenship but will be accorded British registration as physicians and surgeons. The terms and conditions of service will be the same as those for their British colleagues, except that their pay will not be subject to British income tax. They will all be asked to serve for a minimum of one year. Mr. Norman H. Davis, chairman of the American Red Cross, in a statement issued in Washington on April 21, said that he was confident the response from the medical profession would be splendid and that many of those eligible would accept this opportunity for humanitarian service. The project has the approval of the President of the United States, the Secretary for War, and the Surgeons-General of the Army and Navy, as well as the Surgeon-General of the United States Public Health Service. In dealing with the applications the American Red Cross is to have the assistance of the Division of Medical Sciences of the National Research Council, the American Medical Association, the American College of Physicians, and the American College of Surgeons. At a Press conference in London this week Dr. J. E. Gordon, American liaison officer at the Ministry of Health, said he felt sure of the welcome that American doctors will receive from their British colleagues; and Mr. Ernest Brown, Minister of Health, in a message which was read by Sir Wilson Jameson, expressed the nation's thanks to Mr. Roosevelt for his "powerful support," and said that all those who joined us would receive a warm welcome and would form an integral part of our own services.

Prof. W. W. C. Topley, M.D., F.R.S., who holds the chair of bacteriology and immunology in the University of London at the London School of Hygiene and Tropical Medicine, has accepted the appointment of Secretary to the Agricultural Research Council.

TESTING NIGHT VISION

BY

N. BISHOP HARMAN, F.R.C.S.

"Test for Night Vision" is the title of a seven-page booklet[1] by Dr. W. D. Wright, lecturer in physics in the Imperial College of Science and Technology, which accompanies a test designed by him. Dr. Wright's experience as a physicist makes his consideration of the problem of night vision valuable. He writes:

"The ability to see in the dark varies from one individual to another. In normal times a test for night vision is of value as an indication of under-nourishment, as a means of measuring the development of certain visual diseases, and in connexion with scientific investigations on vision. In time of war it is important that all should know how well they can see in the dark, for both their own lives and, if they are motorists, those of other people may be at stake unless they adjust their activities in the black-out to suit their ability to see under these conditions."

There is no doubt of the truth of this statement. But in this country, at any rate up till now, experience has shown that ill nourishment has been of secondary influence in comparison with certain eye defects in diminishing the ability to see at night. But that does not affect the value of any test in these times.

Dr. Wright's apparatus is a simple one. At the ends of a baseboard measuring 8 in. by 6 in. are hinged two other boards which will stand upright. One is a support for the test cards; the other, on the side away from the patient's eyes, has a disk an inch in diameter covered with a luminous radium compound which gives a faint glow of light that serves to illuminate the test cards. These test cards are black. On each is one letter **C**, $4\frac{3}{16}$ in. in diameter and 5/8 in. in breadth of limb. These letters are of varying shades, from pure white to a dark grey that is almost black. There are nine grades. It is recommended that the person to be tested should remain in the dark for fifteen minutes. Then the cards are exposed to the radium glow and examined at a distance of 12 inches. The test lies in the ability to see the gap in the circle of the **C**; whether this is upwards, downwards, to the right or the left. Dr. Wright has tested some 300 persons: 49% could see No. 7; 20% No. 6; 6.5% No. 5; and about 1.5% the faintest, No. 9. Young persons see better than the older.

Practical examination of the test confirms these findings. But certain criticisms arise from this examination: (1) It is evident that the radium illumination may be variable. There can be nothing "standard" about it. (2) The hands of the examiner when shifting the cards are disturbing to the examinee; this is easily prevented by the use of black suede gloves. But worse than this is the fact that examination of the more difficult cards is hindered by a sheen from the smooth black of the cards and the baseboard. (3) The test is made at 12 inches, whereas long experience of eye men has shown that any standard vision test should not be at a less distance than 5 or 6 metres.

Some years ago I made a number of tests of the light sense of patients suspected of tobacco amblyopia. The fields of vision were mapped out in varying illumination. The method was found effective.[2] Since then I have tried other light tests. The aim has been to use a standard illumination and a test that would need a minimum of visual acuity or form sense. A standard candle—i.e., a candle burning 120 grains in an hour—is easily got, and it does not vary. By fitting this candle inside a box (somewhat like a child's toy magic lantern, but with no lenses, a wider "snout," and the inside painted dull black) we obtain a standard beam of light which will illuminate with a glow the usual Snellen test card from a distance. Since the letters on Snellen's test require both sight and knowledge of letters I used my revolving **E** test. (This was designed for use in infant classes. There is one **E** on each line, and each is mounted on a pivoted card so that it can be turned to any position. The child is told to look at the three fingers of the "hand" on the card, and put his own hand in the position of those fingers.)

When, in a dark room, the boxed-in candle-light is placed alongside the patient at a distance of 5 metres from the **E** test card, the light on the card is only 1/269 of a foot-candle. Yet a normal-sighted subject in the early thirties who could see 5/5 easily with the normally lighted test could see with the candle-glow 5/20 and occasionally 5/15.

In both tests—Dr. Wright's 12-inch **C** and the 5-metre **E** cards—it was noted that by a little legitimate dodging it was possible to get better vision than straightforward looking gave. If one looked a few inches away from the test card, above, below, to the right or to the left, it was possible to see the gap in the **C** or the **E** better. It is well known that the light sense of the retina away from the macula is better than that at the macula. In a sense this is a criticism of all night-vision tests, for we can see better than the record of a direct-vision test will show.

Latterly I have used a still simpler distance test card[3]—one that I think needs a minimum of form sense, and therefore one that relies almost wholly on the light sense, though still at the macula. The 5-metre distance test card is a board a foot square. This is covered with black velvet. The test objects are white disks half an inch in diameter, from four to seven in number, fixed on the velvet, each an eighth of an inch separate from the others.

On the board are four separate groups of white disks, each of different numbers, but arranged so as to suggest a common pattern. The groups are covered by another velvet-covered disk in which is a 3-inch hole. This cover is pivoted so that it can be turned to expose any of the four groups of white disks. The baseboard has a hanger at each corner, so that it can be hung four ways. This gives sixteen variations of the test. Before testing, the patient should be in the dark for fifteen minutes or, more conveniently, have a black velvet band clipped round the head so as to cover the eyes. Distance glasses, if needed, must be worn during the test.

The candle-box is fitted at 5 metres from the test card, so that the test is lighted by 1/269 foot-candle. The light that reaches the patient's eye is much less: ignoring loss by reflection, 1 m. from the test = 1/393; 2 m. = 1/527; 3 m. = 1/688; 4 m. = 1/871; 5 m. = 1/1075; 6 m. = 1/1302 of a foot-candle. The room is dark except for the candle rays. The patient stands beside the candle-box and looks towards the test card. A group of white disks is exposed. Most can see the massed white blur, and many can count the number of disks at 5 metres. A few can count at even 6.5 metres. If the patient cannot count at 5 metres he steps forward a foot at a time until he can count the disks. By recording the position of patients in half-metres thirteen grades, from 6.5 metres to 0.5 metre, are obtained. The average of four trials is enough usually. The value of this test is shown by the maximum distance at which one can both see and count the separate white spots. I find a fair average for normal-sighted persons is 5 metres. Those with 4-metres range should be safe at night. Those with 3-metres range or less had better stay indoors. Night-flying men should have a range of at least 6 metres.

It was of interest to check the relation of these indoor tests with outdoor conditions. One night after half an hour in the dark with these tests we stepped into the open air. The night for a moment seemed brilliant by contrast. Yet it was a dark night. There was a slight high mist; a few stars were to be seen, but no moon. There was so little light that with the **E** test the vision of normal persons (with 6/5 full-light vision) ranged only from 1/50 to 3/50. Yet it was easy to walk about, though the ground was on different levels and there were steps.

Experience shows that variations in night vision do not depend wholly upon a light sense. Apart from this there are many conditions that diminish night vision or vary it. Chief among these are: (1) the size of the pupils; (2) the

[1] "Test for Night Vision," designed by W. D. Wright, D.Sc., A.R.C.S., made by the Pitman Press, Bath. London: Sir Isaac Pitman and Sons. (25s.)
[2] *Lancet*, 1934, 2, 821.
[3] Disk Spotting Night-vision Test, made by Theodore Hamblin, Ltd., 15, Wigmore Street, London, W.1.

condition of the crystalline lens; and (3) the retinal integrity. Young folk, with their larger pupils, get more light into their eyes than older folk. This was well demonstrated by a doctor colleague: he had vision of 6/5 in each eye; the left pupil was larger than the right, and the left eye did better with all the night tests. Another colleague showed poor night vision; this was due to lens opacities, even though in normal light the vision was 6/9. Retinal disease has a serious effect upon the light sense; even excessive smoking affects the retina and reduces the night vision.

A paper on testing fitness for night vision[4] and another on night blindness[5] give detailed consideration of variations of sight, and include full biographies. The Report on Wartime Street Lighting (see p. 635) should be considered in this connexion.

There is no doubt that tests for night vision are of use. Dr. Wright has done good service by his designing. But some standard test that could be set up by an ophthalmic surgeon for himself, and yet would be the same for all, would serve still better.

AIR-RAID SHELTER POLICY

VIEWS OF A DOCTOR AND AN ARCHITECT

A Chadwick Lecture on air-raid shelters was delivered on April 8 jointly by Dr. S. L. Wright, who discussed hygienic considerations, and Mr. Philip O. Reece, an architect, who dealt with design and construction. Dr. WRIGHT said that large shelters raised problems of hygiene most difficult of solution, chief of which was the spread of communicable disease, whether air-borne (which was the most important) or by direct contact, inanimate objects, or insect vectors. In hospitals for infectious diseases the only effective method of countering droplet infection was to nurse the patients in separate cubicles. It was out of the question in shelters to provide cubicles for each person, but he suggested that a cubicle should be provided for each family unit, with the ventilation so arranged that the air from one cubicle could not enter another. The edges of the bunks should be at least 3 ft. apart, and the air turnover the maximum possible. The walls and floors should be smooth-finished so that they could be mopped down and dusted, the furnishing and bedding should be retained by the family and used only by them, and the cubicle be disinfected for new occupants.

A method of sterilization of air had not yet been discovered which, while completely innocuous, would bring the enclosed atmosphere up to the standard of fresh air. Air should approximate in standard of purity to the standard now expected in water supply, instead of being something equivalent to a sterilized sewage effluent. Spraying would be sufficient in corridors, sanitary annexes, and canteens. There was a danger of infection in the use of common sanitary conveniences, which could be met by proper supervision, an adequate supply of wash-basins, and elimination of the common roller towel. The necessity for washing the hands after visiting the lavatory and before eating must be emphasized. The habit of undressing at night, which would be possible in family cubicles, should be encouraged as a means of dealing with the problem of infestation.

One reason why not all people brought into contact with infection developed disease was the state of the general bodily health, closely related to the mental attitude, so that without undue exaggeration it might be said that in resistance to infection the dirty but cheerful were as safe as the clean but miserable. To encourage cheerfulness the shelters should be lighted to a reasonable standard—not less than 3 foot-candles in corridors, 4 to 5 in cubicles, 4 to 6 in sanitary annexes, and 7 to 9 in the canteen or communal dining room. Cubicles gave unlimited facilities for sick bays, medical officer's surgery, and first-aid points. Those in charge of aid posts would be the first to admit that without the sanitary provisions he had described their work was little more than a placebo. Although the last winter had been got through without epidemics, the same immunity might not persist. Pestilence followed in the wake of war and famine, and when it started could not be confined within national boundaries, so that all the weapons of environmental hygiene would be required.

Mr. P. O. REECE, from the architectural point of view, developed Dr. Wright's theme further. He said that in eighteen months of war shelter ideas had run the whole gamut from the Anderson with its maximum protection and minimum comfort to the indoor Morrison with its minimum protection and maximum comfort. There was no universal form of shelter equally suited to all conditions. Even the most enthusiastic supporter of deep shelters would have to review his proposals on account of the time and labour required. Instead of designing shelters having in view the effect of bombs of certain weight falling at certain distances, consideration should be given to the disintegrating effect of earth tremors caused by bomb explosions, and it might be wise to follow the methods employed in designing earthquake-resisting structures, whereby a shelter free to slide on the surface would be inherently safer than one embedded in the earth. This ideal shelter would be multicellular in form, made of reinforced concrete, each block holding, say, sixteen cubicles and each cubicle accommodating six persons—a family unit—with the sanitary annexe at one end. Bunks would be supported between cleats embedded in the concrete, with a table between the tiers, and lighting would be so provided in the walls as to give light in each bunk, not to throw a deep shadow, as at present, into the bottom bunk. These blocks, with their sixteen cubicles for ninety-six persons, should be arranged in a radial fashion around a central eating room, which would afford the maximum centralization of services, with consequent economy in drainage, electricity, and water supply. Independent mechanical ventilation would be supplied to each block, and such a system lent itself to easy gas-proofing. In one block provision should be made for surgery and sick bay. The number of houses destroyed by enemy action would probably steadily increase, and the rehousing of homeless people was likely to become one of the major problems of domestic policy; again, the possible outbreak of epidemics would necessitate the isolation of large numbers of people; and, thirdly, imminent threat of invasion would entail movements of troops to areas where extensive accommodation was not available. All these requirements, as well as mere protection against air attack, might be met by this type of shelter. Once constructed, the shelters could be set apart for any of these uses as circumstances might require, and even as they could be adapted during the war for a number of uses, they could be designed for the fulfilment of useful purposes after the war. Smaller shelters with four or eight cubicles could be constructed on the sites of demolished houses and converted into new houses when the war was over, while larger shelters would lend themselves to conversion as sports pavilions, club rooms, and for use for the increased social services that would be demanded when peace came. It was estimated that these shelters could be built for approximately £9 10s. per head—the estimated cost of the present mostly unsatisfactory shelters. Only cement, steel, and shuttering need be considered in their construction.

[4] Ferree, C. E., and Rand, G. (1939). *Arch. Ophthal.*, Chicago, **20**, 58.
[5] Tansley, Katharine (1939). *J. Ophthal.*, **23**, 161.

A. B. Baker (*Amer. J. Path.*, 1941, **17**, 39) concludes that in cases of long-standing hypertension there is very little structural alteration in the average small cerebral artery, while the larger arteries often show arteriosclerotic changes with marked narrowing of the lumen. He believes that the narrowing of the larger vessels reduces the wear and tear on the smaller ones. In so-called "malignant hypertension," however, there are extensive changes in the small arteries, the elastica interna becoming reduplicated and the media undergoing rapid fibrosis and patchy hyalinization.

VEGETABLES AS FOOD

CONFERENCE OF NUTRITION EXPERTS

The third of a series of discussion-meetings organized by the Nutrition Panel of the Food Group of the Society of Chemical Industry was held at the British Medical Association House, London, just before Easter, with Sir E. J. RUSSELL, F.R.S., director of the Rothamsted Experimental Station, in the chair. Previous discussions had been on the merits of cheese and of the potato; this time it was on vegetables.

Chemical Composition of Vegetables

Dr. M. A. PYKE described the chemical composition of vegetable foods. The fat present in green vegetables, he said, was too small to affect the calorific value. In carbohydrate content, cabbages, cauliflowers, broccoli, spinach, and lettuce all contained less than 2%, roots from 2 to 10%, and legumes headed the list with 10 to 18%. With the exception of beetroot, spring onions, and parsnips, all vegetables might be classed as protein foods, but the low percentages were against their use as a major source of protein. As for minerals, green vegetables were the carriers of quite useful amounts of calcium, the richest vegetable in this respect being spinach. Mineral content varied in different varieties of the same vegetable and even in different parts of the plant. Thus the outer leaves of cabbage were richer in calcium than the inner. In respect of vitamins, β-carotene was present in green leaves in relatively large quantities. Green vegetables did not provide large amounts of vitamin B_1; dried pulses were a richer source of this vitamin. There was practically no vitamin D in vegetable foods, but they were an important source of vitamin C. Broccoli headed the list in this respect, and brussels sprouts were extremely good. The high vitamin value of mustard and cress was worth mentioning, especially as this plant could be grown by town dwellers. Asparagus and celery were of low nutritional value. Mushrooms formed a class by themselves, containing small amounts of the principal vitamins. Vegetables were primarily protective foods, and the principles to bear in mind in production and treatment were to choose crops which would yield the maximum amount of vitamin content per acre, and to destroy as little vitamin as possible in storage, preparation, and cooking.

Planning Vegetable Production

Dr. H. V. TAYLOR said that a rough estimate of vegetable production in this country was 3,000,000 tons, which, divided among the population of above 5 years of age, would give 45 oz. a head a week. The Scientific Food Policy Committee set up at the beginning of the war suggested that in order to maintain health the average consumption should be 6 oz. of vegetables a day; it appeared that there was a quantity available slightly in excess of this recommendation. But it must always be borne in mind that vegetables were foods, which meant that people must like them, otherwise there was no point in growing them. A deputation of growers had complained that the planting of brussels sprouts was wasteful, comparing the acreage yield with that of cabbage; but brussels sprouts were appreciated by the public, whereas cabbage was only tolerated, and sprouts were more nutritious, and did not disappear, as cabbage did, with a bad winter. When the war broke out a survey was made of crops regarded as useless from a nutritional point of view; but, with scarcity of meat supplies, some of these plants had to be restored for their flavouring value. Onions were the lowest of vegetables from the nutritional point of view, but 15,000 acres had to be apportioned to them, and altogether 80,000 acres had to be devoted to crops which the nutrition expert would condemn, simply on account of their flavouring value for the drab wartime meal. Nobody had attached much importance to pickles, but pickles were surprisingly popular among Service men. The materials for making pickles in the past had been imported from over-seas, but now a big acreage of land had to be set aside for this purpose. Of the nutritional value of the carrot experts were convinced, and there was a record crop last year of 380,000 tons as against a normal 140,000. But at first carrots were not very popular, and special measures had to be taken by the Ministry of Food to recommend the carrot, with the result that during the last three months the consumption had been 50,000 tons a month, or double the rate of peacetime. As for peas and beans, unless the production of this group was very much expanded the consumption must be much lower than normal. It had been arranged to increase the production of dried peas by 45,000 acres. In normal times one-third of the supply of tomatoes was raised in this country, one-third came from the Channel Islands, and one-third from the Canaries. In view of the loss of the Channel Islands and the difficulties of shipping, steps had been taken to convert greenhouses devoted to flowers to the production of the tomato; an additional 15,000 tons was being raised this year, to be followed by another 15,000 tons next year. The consumption of cauliflower and broccoli was 430,000 tons, an average of 8 oz. a head a week. The conclusions he drew as a planner of vegetable production were that it was impossible to settle the planning on the basis of one or other character of the vegetable; to select only those which the nutritional expert said were the best and to ignore popular preferences would be quite wrong.

Effect of Cooking on Vitamins

Miss M. OLLIVER, in dealing with the effect of cooking on the nutritive value of vegetables, said that the housewife should have the vegetables fresh, if possible from her own garden. Waste must be avoided; to throw away the outer leaves was to destroy valuable material. Roots should be cut very thin or scraped. Green vegetables should be boiled fairly rapidly, using the minimum quantity of water, and the material should not be kept hot. Roots could be boiled, baked, steamed, or fried; salt should be added as it made the vegetable more palatable, and soda used with caution. As to the effect of cooking upon vitamins, carotene was relatively stable and also insoluble in water, and fairly good retention might be expected. The main loss of B_1 seemed to be due to the extraction into the cooking water, B_1 being easily soluble. In most diets, except for cooked vegetables, people did not get vitamin C at all. In times of peace vitamin C was supplied by canned foods and oranges, which were now scarce. It had been said that vitamin C was easily destroyed, but in her experimental work she had found that destruction by boiling was very small. Extraction, however, was great, and only about one-third was retained. There was greater retention with green peas and brussels sprouts than with cabbage or kale. It was possible to get one's normal requirements of vitamin C in one helping of greens if they were cooked under proper conditions, but housewives should be encouraged, if they boiled green vegetables, to retain the cooking water and use it for soups. The retention of ascorbic acid was much higher when the vegetables were steamed, though there were disadvantages in that method on the score of palatability. There was rapid destruction of ascorbic acid with continued cooking or keeping hot. Within forty minutes only about 60% was retained, and after about an hour and a half only a very small proportion.

Effect of Canning

The final paper, by Mr. W. B. ADAM, was on the effect of canning on nutritive value. Loss of nutrient value in canned foods, he said, might occur at any stage of the journey from the field through the cannery to the table, especially during the operation known as blanching, which resulted in some loss of vitamins B_1 and C. There was slight destruction of vitamin C during storage. Canned food diet gave results which were similar in all respects to those obtained from shop-purchased home-cooked food. The vitamin B_1 content might be slightly less than in home-cooked vegetables, but in vitamin C the canned vegetable might be superior.

The CHAIRMAN pointed out that in the change of diet in wartime practicability was the governing consideration. Vegetables could not form an entire diet—they did not, for example, supply any important fat constituents—but fresh vegetables supplied a protein of value at a time when there was a shortage of first-class proteins in cheese and meat. The protein of the green leaf was associated with a good deal of cellulose, which could not be very easily digested, but there was a case for studying and separating this protein from the rest of the constituents of the green leaf. Fruits did not compare with vegetables for nutrients, which was reasonable at a time when a good many gardens and nurseries were used

turned over from fruit to vegetables. In the change-over of diet whereby enlarged amounts of some foods became available and diminished amounts of others, the treatment of food by cooking or canning became of greater importance.

The earlier discussions were reported in the *Journal*, on the potato, November 23, 1940, p. 717, and on the composition of cheese, December 14, 1940, p. 838.

CANCER RESEARCH

WORK IN PROGRESS

In the past an important feature of annual reports of the Imperial Cancer Research Fund has been the Director's critical remarks on matters of current interest in cancer research. This feature, as many will regret, is absent from the most recent report,[1] that for 1940–1, the scientific section being now more strictly limited to the work of the Fund's own laboratories. Nevertheless, it is still possible to glean much concerning the present outlook of the staff of this the oldest of all institutes dedicated solely to the study of cancer. Much of the work is of general interest.

Brief mention is made of a paper by Dr. L. Foulds ("The Histological Analysis of Tumours: a Critical Review," *Amer. J. Cancer*, 1940, **39**, 1), which many have regarded as of considerable importance. The paper deals in a very thoughtful way with influences which determine what structural characters shall be exhibited by different tumours. It relates the relevant facts and discusses the relative parts played by tumour cells and by host tissues. In the past, histological studies have constituted a very prominent part of the activities of the Fund, and it is evident that such studies are still thought, and found, capable of yielding fundamental knowledge of cancer.

Carcinogenic Hydrocarbons

It will be remembered that Dr. B. D. Pullinger began a study of the very earliest changes which are induced in mouse skin by carcinogenic hydrocarbons and that she described cellular characteristics which, appearing as early as the third or fourth day, seemed to be a specific response to the presence of these carcinogens. She has now extended her investigations. Two more carcinogenic hydrocarbons have been examined and the cellular effects of both have proved essentially similar to those of the carcinogens previously tested, whilst in a further series of control non-carcinogenic substances not one has produced other than quite non-specific changes. A singular fact shown by the more recent experiments is that the potency of carcinogenic hydrocarbons as judged by early effects on mouse epidermal cells does not always run parallel with relative tumour-producing potency. The significance of the characteristic early changes is not discussed, and one is left with the impression that Dr. Pullinger is not as yet prepared to claim that they are themselves of cancerous nature.

Mr. H. G. Crabtree has continued his effort to find how far the application of compounds which alter the metabolism of the cell by inhibiting glycolysis can influence the induction of skin cancers in mice by carcinogenic hydrocarbons. One experiment may be mentioned. In it a preliminary period of painting with benzpyrene was followed by a period during which chloracetone was applied. At the twenty-ninth week there were, in the thirty mice treated in this way, eighteen growing tumours, of which eight were epitheliomas; whereas in the control group treated with benzpyrene alone three small papillomas were all that could be found. This result recalls a phenomenon recently described by Rous and Kidd, who tarred the ears of rabbits and found that cells of papillomata which had regressed and disappeared after tarring had been discontinued might again become active, even to the exhibition of fully malignant characters, under the influence of conditions usually regarded as non-carcinogenic—painting with turpentine, for instance.

The problem facing Dr. R. J. Ludford has been to find why carcinogenic hydrocarbons which produce cancers in the living body seem not to induce malignant change in cells grown in tissue culture, although, as he himself has shown, filtrates of fowl sarcomas will readily induce malignant change in tissue cultures of fowl fibroblasts. Under the impression that technical procedures may possibly have been at fault many improvements have been effected. For instance, Dr. Ludford has now used cells taken from closely inbred strains of mice, because when such cells are inoculated into other mice of the same pure strain antagonistic reactions are minimal or entirely absent. Cell cultures have been treated with 3:4-benzpyrene or with methylcholanthrene over periods varying from a few days to six months, but all with entirely negative results; inoculation into mice has failed to produce tumours. Cytological studies of the treated tissue cultures have been made and many derangements of cell division have been observed, but nothing really suggestive of malignant change has been seen. The problem remains and the work continues.

Virus Tumours of Fowls

Study of virus tumours of fowls has not been shelved. Dr. W. J. Purdy, who is seconded from the National Institute for Medical Research, has studied Fujinami tumours growing in ducks and has reached conclusions similar to those recently announced by Dr. Kidd of the Rockefeller Institute, who studied the Shope papilloma growing in domestic rabbits. Both workers find that when several separate tumours are growing in an animal all tend to retrogress simultaneously if they retrogress at all. It is thought that such simultaneous retrogressions can be co-ordinated only by something circulating in the body fluids. At the time the Fujinami tumour retrogresses (a phenomenon characteristic of this tumour when growing in ducks) the blood serum of the host commonly fails to neutralize active filtrate of Fujinami tumour. Thus there seems to be no circulating anti-viral factor. This leaves the possibility of an anti-cell factor responsible for the co-ordinated retrogressions. Dr. Purdy and Dr. Ludford, working in co-operation, have used tissue-culture methods to investigate this suggestion. Cells of the Fujinami tumour were grown in plasma obtained from a duck in which a Fujinami tumour had grown well and then had just started to retrogress—a time at which the hypothetical anti-cell antibody might be expected to have attained its greatest potency—but the tumour cells grew just as well and liquefied the plasma just as readily as in control cultures. And so we are left with the probability that some elusive anti-tumour-cell influence may be present in the host and yet cannot be found by a method which would appear to be adequate.

Oestrogens and Pituitary Changes

It is known that when an oestrogen is used to produce mammary tumours in mice the general hormonal imbalance which results is accompanied by changes in the pituitary gland. Dr. E. Vazquez-Lopez is at present engaged in a detailed histological study of such changes. He has found that in these mice the pituitary changes are more widespread than has usually been supposed, appear throughout the organ, and are mainly of a character suggestive of hyperactivity. Changes originating in the pars intermedia may be specially mentioned. In the cells of this region the Golgi apparatus is greatly hypertrophied, a fact which is taken as an indication of increased secretory activity; there is increased migration of these cells to the pars nervosa, where their disintegration results in a correspondingly great increase in the number of Herring bodies; and the migration of these bodies to the tuber cinereum and the third ventricle can be traced with unusual ease. These Herring bodies, of course, are those granules which have been regarded as being, or bearing, the hormonal secretion of the posterior lobe of the pituitary.

It is known that both the activity of the anterior lobe of the pituitary gland and the character of the secretion can be changed by nerve impulses which pass by way of the central nervous system, but details of the nervous connexions are for the most part unknown. Dr. Vazquez-Lopez has now found in the horse certain bundles of nerve fibres which pass from the tuber cinereum to the pars tuberalis and thence, probably, to the anterior lobe. The nerve tract passing between the pars nervosa and the base of the brain is known, but Dr. Vazquez-Lopez has now shown that in the

[1] Thirty-eighth Annual Report, 1940–1. Published from the Office, Royal College of Surgeons, Lincoln's Inn Fields, W.C.2.

pars nervosa there are far more nerve fibres than has been supposed and that some of these pass into the pars intermedia. In both these regions he has demonstrated multitudes of nerve endings. These suggest a functional activity not fully appreciated hitherto.

Hortega cells have hitherto been thought to occur in all parts of the central nervous system with the exception only of the pars nervosa of the pituitary. Dr. Vazquez-Lopez, studying conditions in the horse, has now observed that in this animal Hortega cells do occur and, indeed, may be seen to constitute an important part of the architecture of the gland.

Co-operation in Research

In this 1940-1 report of the Imperial Cancer Research Fund it is pleasing to note once again the generous co-operation which exists between the various institutions devoted to medical research. Acknowledgments are found, for instance, that for gifts of chemicals Dr. Pullinger is indebted to Profs. Kennaway and Cook of the Royal Cancer Hospital; that Dr. Vazquez-Lopez is indebted to Mr. Glover and the Medical Research Council for provision of pituitary glands of horse, ox, and sheep; and that Mrs. Holmes is indebted to Sir Cuthbert Wallace and Mount Vernon Hospital for helpful collaboration in studies of the cause of the vomiting which sometimes follows exposure to *x* rays. Dr. Ludford of the Imperial Cancer Research Fund has co-operated with Dr. Emmens of the staff of the National Institute for Medical Research in experiments demanding expert knowledge both of tissue-culture methods and of endocrinology. The Fund has maintained its tumour strains and placed these at the disposal of workers in different parts of the country.

PHARMACEUTICAL SOCIETY CENTENARY

COMMEMORATIONS IN LONDON

The Pharmaceutical Society of Great Britain commemorated its centenary on April 15 by a meeting at Conway Hall, which was addressed by Sir John Anderson, Lord President of the Council. It was preceded by a thanksgiving service at St. Pancras Parish Church, at which the vicar of St. Pancras, the Right Rev. Bishop Crotty, was the preacher. In his sermon he said that the story of the Society was part of the much larger story of the development of modern medical science and practice from quite empirical beginnings. The history of medicine revealed an increasing differentiation of functions, originally quite confused and unrelated, into the stabilized and orderly activities of physician, surgeon, and apothecary. The Pharmaceutical Society was a section of the great team in the field of healing. By the standards it had upheld it had rendered a service not only to its members but to the community. It goes without saying that the lesson read at the service was the well-known passage from the 38th chapter of Ecclesiasticus.

The assembly later in the day was presided over by Mr. Walter Deacon, the president of the Society, who, in a brief address, recalled the names of the founders—William Allen, the Quaker chemist, and Jacob Bell, whose efforts were supported by an army of unrecorded workers. They had sought to emphasize the importance of education, examination, qualification, professional unity, and discipline in a world all too much concerned with purely business problems.

The secretary, Mr. H. N. Linstead, read a number of greetings which had been received from professional and scientific organizations in all parts of the world. These included the Royal College of Physicians, the University of London, the British Medical Association, the Linnean Society, the Institute of Chemistry, and the Chemical Society. The message sent by the British Medical Association, signed by the President, Dr. Thomas Fraser, read:

"Our two professions have been closely associated from time immemorial in the service of the public, and we entertain the hope that this friendly and fruitful co-operation will continue. It is gratifying to me to recall that the British Medical Association from an early period in your Socie history has collaborated with it in work for the advancem of medicine and of pharmacy, which has enabled both p fessions to bring benefits to the community."

Sir John Anderson's Address

Sir John Anderson said that his own connexion with Society began in the early days of the National Health Ins ance Act, when he remembered interesting discussions on st topics as stock mixtures and the pricing of prescriptions. the beginning of the last war he was responsible for ensuri a continuous supply of all necessary drugs and medicines, a there followed a period of close and fruitful co-operati between chemists and pharmacists on the one hand and D partments of State on the other, with the result that, in sp of an unfortunate dependence on Germany before the w for much of the supplies of drugs and medicines, it w possible to get through without any serious or even noticeat shortage. The work embodied in the Therapeutic Substanc Act sprang directly from what was done at that time. At t Home Office he had had further contacts with the Society ov the Dangerous Drugs Act and the Pharmacy and Poisons A Therefore it was not strange that with this experience of thir years a member of His Majesty's Government should come congratulate the Society on its achievements and wish it w for the future. It was a matter of historical fact (Sir Jol Anderson continued) that the establishment of the Pharm ceutical Society arose directly out of an attempt on the pa of the medical profession to secure for itself greater priv leges at the expense of the druggists. The pharmaceutical ar the medical professions had some remarkable differences. I the medical profession there were many organizations concerne with the advancement of the interests of the profession, wit the licensing of practitioners, or with medical learning, and th General Medical Council, the custodian of educational an ethical standards. The pharmacists, on the other hand, ha contrived to combine all these functions in a single organiza tion. How easily they might at any time during the last hun dred years have slipped back into the position of a body o privileged shopkeepers concerned only with the furtherance of their material interests!

As a profession they had certain legal privileges. Some perhaps thought that those privileges were inadequate and not in fair correspondence with their obligations; but Parliament did not readily confer exclusive rights upon any section of the community; indeed he believed it never did so unless one simple test was satisfied—namely, that the privilege which was sought was necessary in the public interest. Turning to some of the achievements of the Society, the Lord President said that for fifty years—a period of spectacular, almost revolutionary, progress in medical treatment—the Society had maintained chemical laboratories under the charge of highly competent chemists. Many of the remedies now used in medicine were the products of the chemical laboratory in contrast with the natural vegetable and mineral products whose composition had formed the chief part of the pharmacist's training. The foundation of the new science of chemotherapy had called for intimate collaboration between the chemist, the pharmacologist, and the clinician. The development of all kinds of biological products had completely changed the work of the pharmacists. Again, in the Society's pharmaceutical laboratories, opened by the late Mr. Neville Chamberlain when he was Minister of Health, work of the greatest national importance was being done, particularly in the standardization of therapeutic substances and in the field of nutrition. These laboratories were the only institution in the country where manufacturers could have the vitamin content of foodstuffs and drugs determined. Among the problems of the reconstructive period after the war none would make a stronger claim than those connected with nutrition. He touched, finally, on the many-sided war work of the Society, and ended by congratulating it on its steadfast adherence to the high principles of its founders and its substantial contributions to the common good.

"Jacob Bell and Some Others"

A vote of thanks to Sir John Anderson was carried on the motion of Mr. F. G. Wells, vice-president, seconded by Dr. A. R. Melhuish, chairman of the British Pharmaceutical Conference. The final event was a three-act play written by

Hugh Linstead, the Society's secretary, entitled "Jacob Bell and Some Others." It related how young Bell formed the Society against great opposition, and went for help to William Allen, who became the first president. The third act was staged at the *Crown and Anchor Tavern in the Strand* on April 15, 1841, when the following resolution was carried:

"That for the purpose of protecting the permanent interests and increasing the respectability of chemists and druggists an Association now be formed under the title 'The Pharmaceutical Society of Great Britain.'"

The audience of 1941 played its part, and when the chairman of that meeting a century ago put the motion it was greeted with loud shouts of "Aye" from the spiritual descendants of those pioneers. The twelve actors carried through their parts extraordinarily well, and the play had its amusing passages.

AWARDS FOR GALLANTRY IN CIVIL DEFENCE

The award of the George Medal to Dr. H. R. B. Norman, resident assistant physician, St. Thomas's Hospital, London, to Mr. P. B. Maling, medical student, and to Mr. H. E. Frewer, assistant clerk of works, is announced in a *Supplement* to the *London Gazette* dated April 11.

Dr. HARRY RUMBOLD BATHURST NORMAN, Mr. PETER BROMLEY MALING, and Mr. HERBERT EDWIN FREWER: "After St. Thomas's Hospital had been hit by a high-explosive bomb it was found that two of the staff were trapped in the wreckage. Mr. Frewer formed a rescue party and was joined by Dr. Norman and Mr. Maling. The debris under which the men were buried had crashed through the ground floor into the basement. The dispensary stores had been destroyed in the explosion and the stocks of alcohol and acids caught fire. Gas was escaping from broken mains and masonry was continually falling. Mr. Frewer led the rescue party into this very dangerous area. Dr. Norman, assisted by Mr. Maling, burrowed into the debris and was able to give morphine injections to the injured men. They then continued the rescue work and ultimately succeeded in extricating the casualties, who undoubtedly owed their lives to the gallant conduct of the rescuers."

Local News

SCOTLAND

Health of Wartime Glasgow

The latest report of the medical officer of health for the city of Glasgow (Dr. A. S. M. Macgregor) covers the year 1939, but introduces some matters relating to 1940. The lower death rates and reduction in the incidence of common diseases in 1939 recall the experiences of London and other cities in the year which saw the outbreak of war, but in 1940 Glasgow showed some disquieting features. The general death rate in 1939—13.3 per 1,000—was the lowest on record. There were fewer deaths due to respiratory and infectious diseases. Acute pneumonia, the most common and serious of the diseases of respiration, caused 867 deaths as compared with 1,158 in 1938 and 1,543 in 1937. There were low death rates from measles, scarlet fever, and dysentery, though the rates for whooping-cough and diphtheria were higher than those for the preceding year. Infant mortality fell to 80 per 1,000 births, the usual range being between 90 and 100. Deaths due to puerperal infection numbered thirty as compared with fifty the year before. During the first quarter of 1940, however, there was an outbreak of influenza concurrently with a long spell of severe weather, and these factors gave rise to a relatively severe incidence of pneumonia. By the end of January the death rate had risen to 41.1 per 1,000 of the population and did not fall to normal levels until the end of March. There was also a large outbreak of paratyphoid fever with 274 cases in the city, but only three deaths. For the first time for many years measles was prevalent in summer instead of in winter. The outbreak expected in November, 1939, did not arrive until April, 1940, continued throughout the summer, and tapered off in August. In the later part of 1940 diphtheria in Glasgow, in common with some other parts of the country, reached its highest known prevalence. The medical officer of health considers that these experiences cannot be related directly to the conditions arising out of the war; apart from the influenza outbreak and this prevalence of diphtheria the health of the city was almost as favourable as it was in 1939. The Emergency Hospital Scheme of the Department of Health has not led to any neglect of ordinary civilian needs. Although a large number of empty hospital beds have had to be maintained, the number of patients admitted to the general hospitals of the corporation in 1939 was only 5% below what it was in 1938.

Edinburgh Gift to Polish Students

On April 18 in Sir John Fraser's operating theatre at the Edinburgh Royal Infirmary, Mr. James Watt, LL.D., president of the Graduates' Association of the University, handed to the Polish Medical Faculty, for the use of its students, a set of the textbooks which are in common use in the medical curriculum of Edinburgh University. Among those who attended the ceremony were Prof. Jurasz, Dean of the Polish Medical Faculty; Principal Sir Thomas Holland, Vice-Chancellor of the University; Mr. W. J. Struthers, secretary of the Royal College of Surgeons; Prof. J. R. Learmonth, of the Edinburgh Chair of Surgery; Colonel Stewart, Superintendent of the Royal Infirmary; and members of the Polish Faculty. Dr. Watt, in making the presentation on behalf of his Association, expressed regret that Sir John Fraser himself could not attend as he was detained on business in the South. Prof. Jurasz gratefully accepted the books on behalf of his students; he expressed warm appreciation of the generosity shown to his fellow-countrymen since they came to Scotland, and particularly thanked the institutions and associations linked with Edinburgh University. Sir Thomas Holland said that the giving of this nucleus for the Polish Medical Faculty's library was an expression of the feelings of 20,000 graduates of Edinburgh spread over the world. The forming of the Polish Medical Faculty in Edinburgh was a milestone in the history of medicine.

ENGLAND AND WALES

Co-ordination of Hospital Services

At the annual general meeting of the British Hospitals Association Sir Bernard Docker, who has lately been elected chairman of council of that body in succession to Sir Harold Pink, spoke on hospital regionalization. The Sankey Commission, he said, limited its findings to the regionalization of voluntary hospitals, but Lord Sankey had since given his public approval to a more comprehensive plan which would embrace public authority as well as voluntary hospitals. Indeed, the Provisional Central Council set up by the association itself to carry into effect the Commission's report had soon realized that full co-ordination of hospital services was not possible unless the co-operation of the public health services was also assured. Another powerful factor was the creation of Lord Nuffield's Provincial Hospitals Trust, one of the objects of which was to encourage the organization of regional councils representative of both types of hospitals. Representatives of the British Hospitals Association had been appointed to the council of the Trust, and the liaison would become still closer with the adoption of some recent proposals. Sir Bernard Docker pleaded for active regional committees in the association, which would join effectively with the regional councils of the Nuffield Trust and enable the association as representing the voluntary hospitals to play its part in this field of post-war reconstruction. There were some, he said, who thought it inadvisable to proceed with regionalization at all during the war, but he could not share that view. On the contrary, no time should be lost in building up a consolidated service; that was the view also of the Nuffield Trust. Plans were being prepared in all directions to meet the conditions which would arise after the war, and it was most

undesirable that in the field of hospital service such action should be deferred. The duty of the British Hospitals Association was to ensure that the special position of voluntary hospitals was recognized and to take its part in framing any scheme for the co-ordination of the hospital services of the country. With that in view, the close co-operation of the association with King Edward's Hospital Fund for London, the Nuffield Trust, and other interested organizations was necessary for the formulation of an agreed policy. It was announced at the meeting amid general regret that Mr. R. H. P. Orde had retired from the position of honorary secretary of the association on account of ill-health, and tribute was paid by the chairman to his services in various capacities to the voluntary hospitals extending over a period of forty-two years. Mr. J. P. Wetenhall, house-governor of the West End Hospital for Nervous Diseases, had been appointed to succeed Mr. Orde.

Some Food Facts

The *Wartime Nutrition Bulletin*,[1] which in March reached its seventh issue, contains an interesting summary of the bread position. A brown loaf of 85% extraction from the grain is to be marketed, and probably also the "fortified" loaf, which contains the synthetic vitamin B_1 but none of the other members of the vitamin B group which exist in wholemeal bread. The normal pre-war sale of brown bread is, however, reputed to be not more than 10% of the total. The *Bulletin* also gives a full analysis of the milk situation, particularly the shortages which occurred at the end of last year in Brighton, Manchester and other Lancashire towns, Lincoln, and South Wales. One cause for this is said to have been the official delay in fixing prices and in making known the plans for distribution of foodstuffs. This delay, which seems unfortunately to have occurred again this year, makes farmers tend to slaughter rather than to increase their stocks. The prevalence of mastitis also greatly diminishes the milk supply—to an extent of some 4 to 7% and a sum of £2½ million a year, though only £5,000 is being spent annually in research on methods of combating the disease. The shortage was partly overcome by diverting milk from milk-drying plants, so that the sale of liquid milk is said to have risen by 18%. This increase may not be shared equally throughout the community. The Oxford Institute of Statistics reports, on a small sample of working-class budgets, that between May and October, 1940, there was a decline of 11 or 12% in consumption. In the summer months there is, of course, a milk surplus, which is to be used in cheese manufacture, but this is unlikely to bring the cheese supplies to normal. This is unfortunate, since with rising prices many poor people may be consuming little animal protein. Prof. Bowley found that when the bacon ration was 8 oz. only a small minority of working-class families took their full quota.

Because of the necessity to conserve shipping space, much potential first-class food will now be wasted or diverted to commercial purposes. Palestine in 1939–40 sent us only 8 million boxes of citrus fruits as against 15 million the year before. Much of Jamaica's banana crop will be destroyed or processed for commercial use. In West Africa in 1940, 20,000 tons of cocoa were burnt, though Britain has undertaken to buy and market the whole Nigerian and Gold Coast crop for the duration. The Government has also arranged with the French Cameroons to purchase cocoa, bananas, and coffee, the bananas and coffee to be disposed of locally. In the British Cameroons the restriction on banana exports is likely to lead to diminished plantation areas; bananas may be dried and powdered and used locally for bread-making.

As against this somewhat pessimistic picture, communal feeding is increasing steadily and nutritious food is thus being provided cheaply; in some districts free meals are available for the poorest sections of the community, and at a cost of 3d., 4d., and 5d. for those who can afford to pay. The charges and arrangements vary considerably from district to district, so that it is difficult to give a composite picture—but the general trend, cheapness with nourishment, is in the right direction.

[1] Published by the Children's Nutrition Council, membership of which is 5s. per annum; inquiries should be addressed to the Hon. Secretary, 6, East Common, Harpenden, Herts.

Reports of Societies

URINARY ANTISEPSIS

At a meeting of the Royal Academy of Medicine in Ireland on March 7, the chair was taken by the President, Dr. R. H. MICKS, and Dr. P. T. MCNALLY read a paper on the effects of sulphonamides in the urine.

He summarized *in vitro* experiments on the action of sulphanilamide, sulphapyridine, sulphathiazole, and sulphmethylthiazole on the growth of *Proteus vulgaris*, *Staph. pyogenes*, *Bact. coli*, and *Str. faecalis* in urine, and remarked that the results closely followed those of *in vivo* experiments. None of the drugs had any effect on the *Str. faecalis*, but mandelic acid was usually successful in dealing with this infection. On the other three organisms sulphapyridine had the most effective action. Sulphathiazole *in vitro* had proved disappointing against *Staph. pyogenes*.

Prof. T. W. DILLON asked at what concentration efficient bactericidal action was obtained. Sulphathiazole was absorbed, and excreted, much more rapidly than sulphapyridine. Dr. OLIVER FITZGERALD suggested that urine was not a dependable culture medium when determining the bactericidal action of sulphapyridine. Mr. J. C. FLOOD observed that urine might contain bacteria as a result of excretion from the blood stream or direct extension from an infection of the genito-urinary tract. He asked whether normal urine were itself bactericidal, and in what form the drugs were excreted. He thought it important to remember that the disease was not in the urine, any more than a respiratory disease was in the sputum. Dr. A. R. PARSONS was disappointed that no good results had been obtained for *Str. faecalis*. American journals had reported very good results with sulphapyridine. He thought that half the sulphanilamide dose was eliminated unchanged and the other half as the acetyl derivative.

The PRESIDENT hoped that Dr. McNally would collaborate with the clinicians; simple pyelitis was in everyone's mind. Most workers had found it not difficult to clear up the urine with the older drugs, but pyelitis had a definite tendency to clear up of itself. It was difficult to apply laboratory work to patients; for one reason they suffered from thirst if their fluids were too restricted. Satisfactory clinical results could often be obtained if the amount of fluid were increased without increasing the amount of the drug. He asked if the *p*H should be varied with the drug selected and whether there were significant resistance to these drugs.

Dr. MCNALLY, in reply, said that bactericidal action depended almost entirely on the initial inoculum used; he had tried varying the *p*H and had found that an alkaline urine produced better results with all the drugs. (An annotation on this subject appeared in the *Journal* of April 5, p. 521.)

Hyperventilation Syndrome

Dr. D. K. O'DONOVAN, in a paper on hyperventilation syndrome, outlined the symptoms and treatment, and divided the patients into a hypersensitive group, who developed symptoms after less than two minutes, and the larger group whose sensitivity was normal. He then described three "hypersensitive" cases. In one the sensitivity was affected by relatively minute changes in blood calcium and the patient was cured by large doses of calcium, phosphorus, and vitamin D by mouth. Another patient had low blood chloride due to vomiting. The syndrome was important in the clinical picture of parathyroid tetany, and hyperventilation tetany was closely related to the other tetanies. A low serum phosphate after the subsidence of symptoms was not diagnostic for the hypersensitive group.

Dr. E. HARVEY mentioned the importance of calcium for patients who suffered from fainting attacks, and asked if Dr. O'Donovan had considered the effect of the other ions. A patient might have a fairly normal calcium and suffer from tetany because of an overbalance of potassium and ammonium ions. Dr. P. T. O'FARRELL said that these cases might be labelled epilepsy or hysteria. Dr. W. R. F. COLLIS asked how acute tetany should be controlled in children and what was the exact mechanism of tetany in alkalosis. Dr. D. M. MITCHELL asked

whether anyone who had hyperventilation for long enough would go into tetany; he believed hysterics sometimes did. Prof. J. M. O'CONNOR said that in these patients the *p*H of the body had lost its normal steadiness. When the *p*H first rose the respiration decreased and the central nervous system became peaceful; why then did it become excited when the *p*H went still higher? The insulin convulsion followed the fall in metabolism produced by the insulin. Dr. ALAN THOMPSON mentioned that acapnia might result from the depth or the rapidity of the respirations, as in cerebral haemorrhage, pneumonia, and possibly in hypoglycaemic coma. Hyperventilation might occur if an iron lung were not properly adjusted—and also in fixed acidosis, but he had never observed the syndrome in these cases. Dr. OLIVER FITZGERALD referred to adrenaline as a producer of tetany and of the known relation between potassium and adrenaline; he asked if calcium had any similar relation.

Correspondence

Rehabilitation of the Injured

SIR,—Mr. E. A. Nicoll, in his most valuable article (April 5, p. 501), has again proved that the months and years of incapacity which so often follow industrial injury can be avoided by properly controlled rehabilitation. He has confirmed the experience of Dr. Moore at Crewe and of Mr. Griffiths at Greenwich. Within a few days of reading his article I visited the Rehabilitation Centre at Mansfield and found twenty or thirty miners working hard, developing muscles, mobilizing joints, overcoming inertia, and co-operating enthusiastically with their very capable physiotherapist, Mr. Colson, C.S.M.M.G. None were willing to admit of boredom; all were happy and cheerful; all were on their way to recovery. What a contrast with the miserable victims of industrial injury who tread their weary path from one consulting room to the next, who are reported upon at monthly intervals, and who, having lost the will to recover, steadily become enmeshed in the medico-legal web. As I have written elsewhere, "With the stimulating atmosphere of friendly rivalry, the enthusiasm of the crowd which contrasts so sharply with the helpless despair of the individual, and with carefully graduated physical stresses, more can be done by a few weeks of rehabilitation treatment than by months of 'light work' or years of massage."

The tragedy is that, knowing the solution to the problem, we are failing to apply it. In days of peace 200,000 fractures were sustained in this country each year. Allowing for injuries other than fractures, the figure should be doubled or even trebled, and with the increased risks of war we may well find that the figure exceeds half a million. Rehabilitation treatment is available for thirty men at Mansfield, for thirty at Crewe, and for thirty at Greenwich. What is happening to the other 499,000 odd? A great army of industrial workers is being wasted at a time when man-power is of such vital importance that women are being called upon to take their place in industry. Rehabilitation centres must be established forthwith at every place where fractures are treated.

It is to be noted that remedial workshops are not rehabilitation centres. Similarly, occupational therapy centres are not rehabilitation centres. Useful as these additional measures may be, the basis of rehabilitation depends upon direct contact between surgeon and patient. As Mr. Nicoll so rightly emphasizes, the individual must be inspired, his confidence must be gained, he must learn that recovery will come by his own unremitting efforts. Only after that are remedial workshops, occupational therapy centres, and group exercises by P.T. instructors of any value.—I am, etc.,

Liverpool, April 15. R. WATSON-JONES.

SIR,—In your leading article on rehabilitation of the injured (April 5, p. 519) mention was made of three rehabilitation centres, each for a particular trade: Berry Hill Hall for miners, the L.M.S. centre at Crewe for railway workers, and the Albert Dock Hospital for seamen. May I point out that the Albert Dock centre is not restricted to seamen. The majority of cases are in dock labourers or workers in the various factories in the dock area, and comprise members of a large variety of trades associated with heavy industry.

The running of a clinic of this nature emphasizes certain difficulties more than does a clinic such as Mr. E. A. Nicoll describes (p. 501) at Berry Hill Hall. When all the patients come from the same industrial organization and the clinic is part of that organization, it appears possible to exert control and discipline in employing set exercises, but in a clinic which caters for patients from any source, with a purely voluntary attendance, an attempt to make the men pull weights and perform strenuous physical exercises may lead to slackness and irregular attendance. Dr. Bohler relied almost entirely on remedial exercises, but his clinic was run with a military discipline that no English workman would tolerate. Undisguised exercises, moreover, sometimes have a bad psychological effect on the patient, emphasizing disability and pain, and causing despondency when recovery is slow. At a mixed clinic, therefore, especially where the majority of patients are not removed from their home surroundings to what approximates to a convalescent home, pure remedial exercises may be difficult to employ as the basis of treatment. By the greater use of recreational activity, selectivity suffers to a certain extent, but some graduation of effort can be achieved by a good trainer, and greater co-operation is obtained from the men. It is found that a large proportion of patients will recover with general measures, and the few that do not respond satisfactorily can be then tried separately on set exercises.

Occupational therapy, the third method of treatment mentioned by Mr. Nicoll, is probably the most difficult to attempt in a clinic recruited from all and sundry. For instance, at the Albert Dock clinic a garden was started, but the majority of men required a bribe of beer to work in it. They thought that their time would be better spent in their own home gardens. On one occasion, when the men were asked to help remove a heap of coal that had been dumped accidentally on the playing area; there was a complaint leading to a conflict with the local trade union leaders.

A fourth and most important part of treatment is psychology: in fact, it may be said that all forms of physical treatment will often fail if this is neglected. First, as Mr. Nicoll emphasizes, the workman must be convinced that getting well is hard work and a whole-time job. Secondly, every attempt should be made to relieve his mind of financial worries and despair of getting another job when he is discharged from hospital. Under the influence of these two factors, slight pain and physical impairment, insufficient in themselves to prevent a return to work, can cause total disability and make futile all efforts directed solely to bone alignment and muscle function. They contribute largely to the considerable time-gap (sometimes years) that exists between the duration of hospital treatment (regarded by many clinics in their statistics as the date of cure) and the time off work. No injured workman can be honestly regarded as recovered until he is actually doing work of a similar nature to his pre-accident employment. The ideal to aim at is never to discharge a workman except into a job that is waiting for him, and then to be prepared to take him back for further treatment if, after a week or so, he finds he is still unable to do the work. This is the only way that true statistics can be obtained. It would play havoc with many claims of successful end-results and quick recovery times, but it would greatly diminish the large number of compensation claims heard in the courts one, two, or even three years after the patient has been discharged fit for work from the hospital. The man returns to work sooner, knowing that if any residual pain and stiffness prove disabling he will be taken back by the hospital without prejudicing his compensation payments or his position with his firm.

At the Albert Dock Hospital considerable success has been achieved in obtaining the co-operation of employers, by means of which a man can be told that a job is waiting for him as soon as he is fit, thus removing from his mind at the commencement of physical treatment a very real obstacle to recovery. On one or two occasions men were so worried about debts incurred since their accident that all attempts to get them fit for work failed, and they seemed bound to join the ranks of the permanently incapacitated. The offer of a

sympathetic employer to settle their small debts and provide them with work caused a dramatic recovery, and a happy, competent workman was restored to industry.

There are very few true malingerers, and the number that deliberately seek compensation claims can be materially reduced by suitable psychological treatment. However, there is a serious danger to success from the touting agents of certain firms of solicitors. These hang around fracture clinics attempting to undermine the patient's confidence in the disinterestedness of the medical staff, and persuade him to put his "case" in the hands of the solicitors they represent. I have known patients to fall under the influence of these men immediately on arrival at the hospital, even before they have been seen by the doctor on duty.

In conclusion, may I suggest that the value of rehabilitation treatment is not confined to the recently injured. Old cases, perhaps of years' duration, with gross deformity, and apparently a permanent liability on the State, often do surprisingly well. The knowledge that at last someone is taking an interest in their "case," combined with the strengthening of muscles allowed to grow weak from disuse and the atmosphere of cheerful expectation of recovery that should pervade every rehabilitation clinic, will sometimes restore a hopeless chronic to partial or full work in a surprisingly short time. One or two of these cases in a year will handsomely repay a firm for any financial aid they give to the clinic or the injured workman.—I am, etc.,

G. R. BUTTERFIELD, F.R.C.S.Ed.,
Late First Assistant, Albert Dock Hospital
Fracture and Rehabilitation Clinic.

London, April 17.

Transfusion of Red Cells

SIR,—In the present emergency the frequent occurrence of shock in patients injured in air raids necessitates the maintenance of large stocks of plasma in blood "banks." When plasma is prepared the erythrocytes are usually discarded. It is apparently not widely realized that the red cells can be used effectively for raising the haemoglobin level in anaemic patients not suffering from shock. In fact, concentrated cell suspensions have certain definite advantages over whole blood for patients whose haemoglobin is low but whose blood volume is not reduced—for example, pernicious anaemia, aplastic anaemia, haemolytic anaemia, purpura, or post-haemorrhagic anaemia when the bleeding has stopped and the blood volume has been restored from the tissue fluids.

Since the volume of cells from 500 c.cm. of whole blood is approximately 250 c.cm., including the residual plasma (the exact volume depending on how completely the plasma has been separated), it follows that the rise in haemoglobin after the transfusion of a certain volume of cells is about twice that which follows the transfusion of the same volume of whole blood. Alternatively, to produce a given rise in haemoglobin it is necessary to transfuse red cells in only half the volume of whole blood required for this purpose. Accordingly, the transfusion can be completed much more rapidly with decreased risk of left ventricular failure and pulmonary oedema.

It should be pointed out that the red cells should be utilized as soon as sedimentation is far enough advanced for plasma separation—twenty-four to forty-eight hours after withdrawal of the blood, which is stored for this period at about 4° C. The cell suspension then contains the majority of the white cells and thrombocytes, and the residual plasma contains complement. Hence the suspension of red cells from a litre of blood has been found as effective in controlling haemorrhage as half a litre of fresh blood. It might be thought that a concentrated red-cell suspension of this kind would be more difficult to transfuse than whole blood and might involve increased danger of capillary blockage. Actually, we have not found this to be the case, using an efficient filter such as is supplied by most transfusion services. As a rule, however, we add about 100 c.cm. of sterile saline to the cells from each pint of blood; this reduces viscosity and the saline leaves the circulation before the transfusion is completed.

We have given transfusions of concentrated red-cell suspensions to many patients suffering from primary and post-haemorrhagic anaemia, invariably with satisfactory results. Single transfusions of red cells from two to five pints of blood have been given in one to two hours, the exact amount depending on the severity of the anaemia.

The object of this letter is to call attention to a method of transfusion which combines economy of blood with, in suitable cases, actual therapeutic advantages.—We are, etc.,

STANLEY DAVIDSON.
C. P. STEWART.

The University, Edinburgh, April 17.

Crush Injuries

SIR,—In common with your other correspondents I would like to congratulate the various authors for their work carried out in difficult circumstances on uraemia following crush injuries. There would appear to be a general idea that the syndrome has existed unobserved in civil practice, and pit accidents are put forward as a likely source. However, no instances have been cited since the articles appeared in the *Journal* of March 22, and I write to call attention to two cases published under the title of "Renal Lesions from Traumatic Shock," by Husfeldt and Bjering in 1937 (*Acta med. scand.*, 1937, **91**, 279). Both patients sustained fracture of the pelvis and damage to soft tissues. Shock developed in both, yielding to transfusion of citrated blood. Death occurred on the eighth day with a rising blood urea, hypertension, oedema (in one case), and general signs of uraemia. The urine was very scanty, of low specific gravity, and contained casts and a few erythrocytes. Renal function tests gave very low results. At necropsy no injury to kidneys or urinary tract was found. Microscopically the chief lesions were emptiness of the glomerular capillaries and degeneration of the epithelium of the tubules, in some of which granular-coloured pigment was present. Husfeldt and Bjering showed that incompatibility of blood could be reasonably ruled out in their cases by the preliminary tests, and further stated that the clinical manifestations and necropsy findings were not those characteristic of a fatality following a transfusion with an incompatible blood. In two of the cases reported by the M.R.C. Subcommittee in the *Journal* neither blood nor one of its derivatives was employed in treatment. This makes it improbable that one of these substances is responsible for the uraemic manifestations. In contrast to the air-raid casualties the duration of crushing was short—a matter of minutes rather than hours—and shock treatment was instituted soon after injury.—I am, etc.,

J. BASIL RENNIE.

Glasgow, April 15.

Limb Compression Ending Fatally in Uraemia

SIR,—With reference to the case of limb compression ending fatally in uraemia, which was especially reported in the *Journal* of March 22 (p. 434) by Drs. R. Mayon-White and O. M. Solandt because no blood transfusion had been given, I noticed that the child had had three transfusions of four-times-normal serum made from the pooled sera of Group A, B, and AB donors. I realize that the serum from AB donors is free from agglutinins, and also that serum taken from a mixture of A and B bloods may be practically free from agglutinins, but I see no reason to suppose that agglutinins are in any way lessened by mixing A and B sera after the agglutinogens in the red cells have already been withdrawn, as had apparently been done in this case.

It would appear to me that the serum used was possibly not free from agglutinins, and when given intravenously in concentrated form would be excreted almost immediately by the kidneys and might cause haemolysis of the recipient's red cells. This may be another explanation of the possible cause of "transfusion kidney" reported in so many cases of limb compression. I should like to know if serum and plasma are tested for the presence of agglutinins before being issued.

Crush injuries due to falls of roof are not uncommon in colliery districts; I have always treated them with rectal hypotonic saline and glucose as well as intravenous treatment, and I am wondering why more use was not made of rectal saline in the cases reported. These cases of anuria are apparently due to blockage of the renal tubules. It has occurred to me that dilatation of the renal tubules in an established case might be attempted by spinal or splanchnic anaesthesia.—I am, etc.,

J. T. RICE EDWARDS.

Newport, Mon., April 12.

Crush Injuries and Renal Failure

SIR,—In the cases of crush injury reported in the *Journal* of March 22 there is evidence to suggest that, whatever the mechanism, the result of the injury is to produce intravascular haemolysis. Many of the patients passed blood-stained urine soon after admission to hospital. Though jaundice has been reported so far the blood bilirubin in the case quoted by Beall, Bywaters, Belsey, and Miles was slightly raised.

Prof. Baker has shown[1] that post-transfusional urinary suppression is due to excretion of haemoglobin with a urine of high acidity and salt concentration. Under these conditions the excreted haemoglobin is converted to a granular deposit of haematin which obstructs the renal tubules. He also showed that, conversely, if the urine be alkaline no haematin granules are formed.

Thus it would seem that in these crush injuries more attention might profitably be given to the reaction of the urine, and that the aim of treatment should be to maintain an alkaline urine.—I am, etc.,

T. DINSDALE,
Surgeon Lieutenant, R.N.V.R.

March 29.

Blast Injury to Lung

SIR,—I should be grateful if you would allow me space to comment on certain matters of fact raised by Dr. G. R. Osborn (April 5, p. 506).

1. When a bomb bursts in a confined space reflections from the walls increase both the impulse of the blast wave and the time for which high-pressure values are sustained. Assuming that the walls are blown out, this increase in time is, however, only a matter of some thousandths of a second. On the other hand, if the force of an explosion is insufficient to break the walls in an "average" house (that is, if the explosion is a small one) the blast wave is reflected from wall to wall until its energy is absorbed and its pressure falls to that of the normal atmosphere. In the first case blast injuries would be of little clinical interest, since people in the room with the bomb would almost certainly either be killed or also suffer from severer injury due to agencies other than blast. In the second case it is unlikely that people in the room would be directly hurt by the blast, for, as both experiment and critical field observation have shown, if the pressure is insufficient to knock down walls of ordinary thickness and construction it would also be below the threshold at which lung damage occurs.

Dr. Osborn is misleading in treating a house in which an explosion takes place as a single unit. Lest his remarks about the extensive risk of the direct effects of blast in houses cause alarm, it should be stated that when a bomb of small or medium calibre bursts in a room so much energy of the blast is absorbed in shattering the walls that the pressure outside the room is as a rule relatively small, and relatively harmless from the medical point of view. This has been found both by experiment and by careful analysis of actual incidents in which people have been in rooms adjacent to one in which a bomb has burst and blown out the intervening walls. With all except the very heavy types of bomb, primary blast injuries are unlikely outside the room in which an explosion occurs or in open passages leading from such a room. Primary blast injuries in houses from bombs falling outside are only likely when the bomb is so big and the pressures so great that the houses are completely demolished.

2. Dr. Osborn states that there is "no justification" for my reported remark (*Journal*, January 18, p. 94) that at sixty or seventy feet the blast pressures in the open from a "large" bomb cannot directly harm even though they may be sufficient to damage walls and windows. Paradoxically, he also states that this view is usually true. The justification for the statement is that it is based on actual observation. It is not usual to publish the sizes of bombs. Nevertheless it can be stated that since it is necessary to multiply the charge eight times to double the distance at which a given pressure will occur (a law to which I referred in my paper to the Royal Society of Medicine[2]) the threshold distance for "primary-blast" lung injuries even for the largest bombs now occasionally used is unlikely to exceed, say, 150 feet in the open.

Human beings are very much more resistant to the primary effects of blast than are most building materials. Furthermore, in so far as an evaluation of the position is possible on the available facts it can be stated that, at the same distances and from the point of view of the direct effects of blast, a man in a room in which an explosion occurs is worse off than a man in the open; whereas a man in a room adjoining one in which an explosion occurs is better off than he would be in the open.

3. Not academic interest but practical need made it urgent to discover how blast exercises its primary effects on the body and to what extent its direct effects can be observed in air-raid casualties. We have taken no pains to belittle, as Dr. Osborn suggests we have, or to exaggerate the importance of, the problem. Owing perhaps to lack of knowledge of the circumstances under which his cases were injured, knowledge which Dr Osborn suggests is not only unnecessary but perhaps misleading, it is doubtful, as my colleague Dr. Krohn suggests below, whether Dr. Osborn's paper has in fact much to do with the direct effects of blast—except in so far as it speculates about the subject. His cases reveal no evidence of direct blast injury as the term should be used, and much evidence of more understandable forms of trauma due to secondary and tertiary effects of blast—violent displacement, falling masonry, and secondary missiles, any or all of which, as I have emphasized before, may cause lung injuries that in many respects resemble those caused directly by blast.[3] It is probably to such agencies mainly that most lung injuries in air-raid casualties are due. Whatever their cause, however, it is necessary, as Dr. Osborn points out, that their presence should not be overlooked.—I am, etc.,

S. ZUCKERMAN.

Department of Human Anatomy, Oxford, April 21.

SIR,—There can be no question that many varied forms of trauma to the thorax, as well as the blast from high-explosive bombs, can produce haemorrhagic lesions in the lungs without causing any obvious injury to the surface of the chest. It is also clear that, whether the direct action of blast, or falling on to a hard surface, or the impact of flying masonry is responsible for the injury in air-raid casualties, all three immediate causes depend on the explosion of a bomb. Finally, it is apparent that, however the lung injury is caused, the means of diagnosing it clinically and the methods of treatment are likely to be similar.

These general points Dr. G. R. Osborn rightly brings out in his article in the *Journal* of April 5 (p. 506). He appears, however, to deprecate attempts to look more closely into the matter, and *ex cathedra* suggests that, as a rule, blast plays a direct part in causing injuries to people removed from bombed buildings (presumably forgetting that explosions have not occurred in a very high proportion of what are called bombed buildings).

It is permissible to use Dr. Osborn's series of eight fatal cases to test this generalization. No details about external or internal injuries are available for one case. Of the remaining seven: Three had fractured skulls—one of these cases, a girl of 17, appears to be the same as that described by Osborne in a previous paper.[4] In the present account Osborn states that a fractured skull was the only external injury. In his earlier paper he refers to abrasions of the right hand. One had a fractured skull and fractured ribs. One had multiple injuries from secondary missiles, with a penetrating wound of the chest, and a forearm "blown off." One had multiple penetrating wounds, four of which perforated the skull, and four ribs were also fractured. One had a perforating wound of the chest.

Some degree of intrapulmonary haemorrhage was found in all but one of the seven cases (the exceptional case being one of the three with only a fractured skull). Of these six, four had either perforating wounds of the chest or fractured ribs. These obvious chest injuries (and falls or crushes probably associated with them) might well have been the cause of the observed intrapulmonary haemorrhages.[5] Clearly, too, the remaining two cases with fractured skulls must have suffered

[1] "Urinary Suppression following Blood Transfusion." S. L. Baker, *Lancet*, 1937, 1, 1390.
[2] Zuckerman, S., *Proc. roy. Soc. Med.*, 1941, 34, 171.
[3] Osborn, G. R., *British Medical Journal*, 1940, 2, 317.

violent external trauma, which, it is also known, may cause lung damage without any apparent external injury.

It is, of course, possible that part or all of the observed lung lesions may have been direct effects of blast. Since, however, this possibility must remain speculation, it is surely safer to suppose that the more obvious trauma to which the casualties were subjected was responsible for the pulmonary lesions, and that blast played only a secondary part, if any part at all.

Another point in Dr. Osborn's account which suggests this conclusion is the fact that Cases 1 and 2 were beside each other when the house they were in collapsed. The blast pressures sustained by these two casualties were probably identical, and while there is individual variation in the lesions caused by a given pressure, probably the most satisfactory explanation of the different degree of lung damage would be that the injuries were not due to blast acting on people of different physique, but to falling masonry or debris, the effects of which might well have been different for the two persons. It is particularly in this sort of case that the exact history of the incident, which is rejected as misleading by Dr. Osborn, would in fact have been of value—not perhaps to the clinician, for the patient soon died—but perhaps to the pathologist and experimental worker.

Furthermore, Dr. Osborn emphasizes the importance of the severe damage to abdominal organs which occurred in four of his cases. It should be noted that while about 40% of animals exposed to blast showed abdominal lesions these were usually only small patches of petechial haemorrhages in the intestinal wall; serious tears or ruptures of abdominal organs were rare.[2] Since the animals were undoubtedly blasted (in the sense that the term relates to explosions) and yet failed to show serious damage to the abdominal organs, it appears possible that the severe visceral lesions described by Dr. Osborn were not due to the blast but to the impact of a more obvious crushing agent.

Dr. Osborn remarks that lung injuries are "now only too common in hospital practice," even though the number of such cases reported already would seem to be remarkably small. The publication of detailed information concerning these cases would be very valuable and more likely to bring solution of the problems closer than speculation unaccompanied by experiment. It may be added that Dr. Payne reports in the *Journal* of April 12 that he has seen no blast injuries in a series of 226 air-raid casualties.

There are two methods which may help us to decide the importance of blast in causing injury. (1) Rupture of the tympanic membrane will often be present if the patient were close enough to suffer at all seriously from the effects of blast. The eardrums of air-raid casualties should always be examined. (2) While fat embolism does not appear to play any part in causing the experimental lesions due to blast,[2] there is evidence that it does so in cases due to direct trauma. Robb-Smith's simple and effective post-mortem test[4] for the presence of fat emboli may help to differentiate the two types of injury.

Some other issues raised by Dr. Osborn are perhaps treated more dogmatically than is justified at present. Thus the question of whether the haemorrhage into the lungs is progressive or not cannot be answered by a plain yes or no. Any haemorrhage in any part of the body may be arrested or may continue. There can hardly be more justification for saying that all haemorrhages will stop than for saying that all will be progressive. Moreover, while it is very likely that the pressure component of the blast wave is the important factor in causing injury, the physics associated with the sudden and extremely brief impact of a wave of high pressure on such a complicated system as the thoracic contents are anything but obvious. Dr. Osborn writes that "to understand the lesions described for blast in animals and man there is no need to assume that blast has any mysterious properties." Yet he refers later to "the peculiar behaviour of blast on houses." This is an unusual inversion of the more reasonable doctrine that, while we can often define with accuracy the effects of a given agent on inanimate objects, the responses of the human body to the same stimulus are generally more difficult to unravel.

Finally, surely Dr. Osborn does not really mean us to believe that in determining the severity of injuries "the state of the patient is probably of greater importance than the size of the bomb or the distance from it." Whether the bomb is 500 lb. or 50 lb., and the distance 50 ft. or 10 ft., a surely more important than being thin and naked, or obese and heavily clothed, at either of those distances.—I am, etc.,

P. L. KROHN.

Department of Human Anatomy, Oxford, April 15.

[4] Robb-Smith, A. H. T., *Lancet*, 1941, 1, 135.

Treatment of Burns and Scalds

SIR,—From the numerous letters that have appeared in the *Journal* recently on the treatment of burns, and from the number of local remedies advocated, one can only conclude that up to the present no local application has been found that can be safely recommended to the profession for the routine treatment of burns. Everyone seems to be agreed that tannic acid rightly applied—that is, after thorough cleansing of the skin—is probably the best remedy of all. But what appalling results one meets with after the indiscriminate use of that extremely excellent application tannic acid jelly, which is now to be found in every household!

The question arises, then, Is there any application that one can safely recommend in all cases? Almost more important still, Is there any application that one can safely recommend to first-aid parties? I believe that the only preparation that meets all the requirements, not only as a first-aid measure but also as a routine treatment of burns, is acriflavine emulsion, 1 in 1,000. I have used this preparation now for a considerable time to the exclusion of all other forms of local treatment and have never been disappointed. It possesses the following merits: it is safe, it is soothing, it is antiseptic, and healing takes places more quickly than with any other local application that I am acquainted with.—I am, etc.,

T. J. HOLLINS.

Battle, April 13.

Epidemic Gastro-enteritis

SIR,—The problem of epidemic gastro-enteritis, such as described in the report by Lieut.-Colonel A. H. D. Smith and Captain D. J. Davies (April 12, p. 554), is one which has confronted all general practitioners during the past winter, and the value of the report seems to lie in the negative bacteriological and epidemiological findings. As the writers state, these findings suggest perhaps a virus infection allied to influenza, or perhaps influenzal gastro-enteritis itself. Identical cases to those reported have been frequent this year, and the opportunity of observation in a military camp is valuable, since large numbers are not seen in general practice, nor are the opportunities of laboratory aids open to the busy practitioner.

The cases seen have shown many diverse symptoms, some of which are not mentioned in the report and which may or may not be related to the one infection, but at any rate they occurred in the same patient, either at the same time or more frequently preceded or followed on the gastro-enteritis.

The following appear to have been the main types: respiratory catarrh, bronchitis and pneumonia, vomiting and/or diarrhoea, epigastric discomfort and nausea, myositis and fibrositis ("muscular rheumatism," especially interscapular), neuritis (localized—e.g., supra-orbital or external popliteal), and low back pain chiefly affecting the sacro-iliac joints (this persisting for one or two weeks). Two patients developed joint swellings similar to acute rheumatism. In addition I have noted several cases of acute conjunctivitis of moderate severity, one case commencing with this and developing the gastric symptoms three days later. Almost all the patients had one constant feature—namely, redness and soreness of the fauces. All the cases seen cleared up rapidly, with the exception of those more severe respiratory affections, chiefly in the older patients. Several cases showed definite localized tenderness in the right iliac fossa and were difficult to differentiate from acute appendicitis, but the associated symptoms, and often accompanying tenderness over the epigastric region, were as a rule present. This appendicular tenderness, it is reasonable to suppose, was due to involvement of the lymphoid tissue in the appendix similar to that of the tonsils or fauces. In these cases among the general public the incubation period and infection by direct contact were noted to be similar to those mentioned by the writers of the report, but in some cases the contact developed the related, and not the identical, type of symptoms.

Finally, as mentioned above, the opportunity of pathological investigation presented in the military camp is valuable, and seems to stress the need for a medical service on the lines suggested earlier by Dr. S. Terry Pybus (*Supplement*, March 15, p. 29) in which central clinics and laboratories would give those opportunities of investigation at present denied to a busy general practitioner.—I am, etc.,

Brierfield, Lancs, April 14. H. C. PALIN.

Incubation Period in Cases of Gastro-enteritis

SIR,—Lieut.-Colonel A. H. D. Smith and Captain D. J. Davies (April 12, p. 554) give an interesting account of an outbreak of gastro-enteritis among troops.

I have seen forty-seven cases this winter with symptoms and signs as they describe. I have not the facility for examination of the stools in each case, but I have had negative reports in four cases. These observers put the incubation period at thirty-six hours to seven days. Many of the cases I have seen have had an incubation period of twenty-four hours. I have no recollection or record of any case in which it was longer than four days. In one family the father had been away on business and stayed with a family where the infection was in progress. He returned home one evening and was himself ill in the night. Exactly twenty-four hours after his return home one child took ill, and the other three persons in the house were all attacked within four days. These, of course, may have been infected by the husband or by later infected persons in the household. All had been inoculated with T.A.B. two months previously. This family history is almost typical.

I agree, too, with the sporadic distribution of the infection. I cannot narrow it down to contamination of milk or food.—I am, etc.,

Leeds, April 14. R. A. MURRAY SCOTT, M.B., B.Ch.

Digestive Disorders in the Forces

SIR,—I was very interested in the article by Lieut.-Colonel J. Gibson Graham and Captain J. D. Olav Kerr on digestive disorders in the Forces (March 29, p. 473). We do not fully understand the cause of peptic ulceration yet, but the stress and strain of modern life seems to be a predisposing factor in many cases. Hence it seems astonishing that men should be accepted for service who have had definite ulceration previously, not to mention haematemeses, perforations, and gastro-enterostomies.

Surely it is plain to see that a few weeks of Army life may undo perhaps years of treatment. As the authors point out, many of these men were able with care to carry out a normal and useful civil life. If such men are accepted they will rapidly be occupying hospital beds, be no use at all as soldiers, and have weeks of treatment in front of them before they are able to return to their civil occupation again.

It is to be hoped that medical boards will in future reject all who suffer or have suffered from this serious and painful complaint.—I am, etc.,

Sheffield, April 13. J. A. WOOD.

Obscure Nervous Effects of Air Raids

SIR,—I have read with great interest Mr. Tom Harrisson's letter on this subject (April 12, p. 573). If it could be arranged for these cases to be examined by a competent rhinologist I believe it would be found that all, or nearly all, of them were suffering from chronic sinusitis. The combination of concussion—whether blast or impact—with sinusitis seems to produce a *forme fruste* of encephalitis lethargica.—I am, etc.,

London, W., April 16. H. CRICHTON-MILLER.

Malarial Therapy for Epilepsy

SIR,—With reference to your annotation on the treatment of G.P.I. (March 29, p. 486), the late J. C. Ramsay (*J. ment. Sci.*, 1929, **75**, 257) treated with malaria at Claybury Mental Hospital six cases of epilepsy, four of which showed the haemoclastic crisis. Four patients showed a temporary reduction of fits with a subsequent increase during observation periods exceeding seventy-five days after the final malarial paroxysm. In two cases amelioration of the mental condition occurred.—I am, etc.,

April 2. G. DE M. RUDOLF.

Convulsion Therapy by Electricity

SIR,—Dr. James S. McGregor (April 12, p. 571) takes as the basis for his criticism of faradic shock therapy his own statement that this treatment was fully investigated in the nineteenth century. And a casual reader might be justified in assuming that in advocating it I am as culpable as if I had proposed to reintroduce the strait-jacket and the whip into psychiatric practice. But on closer investigation one soon realizes that the nineteenth-century methods were not identical with those described in my article. The details of Allbutt's technique, which Dr. McGregor describes, illustrate this point very well. Allbutt (1872) passed a galvanic current for ten minutes through the patient's head in order to obtain a "tranquillizing effect." This is surely quite different from the method that I described, the differentiating features of which are: (*a*) that the procedure is used as an aid to psychotherapy; and (*b*) that a period of psychological stimulation is produced by a series of short faradic shocks, followed by a period of depression produced by barbiturate anaesthesia. In fact the only similarity I myself can see between these two methods is that both make some use of electricity in the treatment of mental disease. And incidentally they have this point in common with the electric convulsion therapy which Dr. McGregor champions so ardently. Surely if we are going to follow Dr. McGregor in condemning faradic shock therapy because something vaguely similar was practised in the nineteenth century, we must also decry Berger's electroencephalography because Caton in 1875 showed that electrical changes occurred in the brain, and his work aroused very little comment.

I was interested to read Dr. McGregor's explanation of the method of production of the convulsion which I described. He says "it was possibly brought about by summation of subliminal stimuli." But the "subliminal stimuli" were applied at intervals of twenty-four hours, and summation is generally not supposed to occur if the interval is longer than twenty-thousandths of a second. So I feel that in making this suggestion he is taking up rather an unorthodox attitude to the accepted views on the physiology of the nervous system.

As for Dr. McGregor's allegation that my statements regarding the dangers of convulsion therapy were "unwarranted" and "misleading," it seems that he wrote his letter without bothering to consult the four references which I gave in support of those statements. And also it is apparent that, although he is so well acquainted with the West Riding Lunatic Asylum Medical Report for 1872, he is unfamiliar with the issue of the *Journal of Mental Science* for 1941 (p. 230) in which Cook and Sands give eleven references to papers on spinal fractures resulting from convulsion therapy. I envy Dr. McGregor his good luck in having induced 1,800 major fits without the occurrence of any complications. But at Winson Green Hospital we make a routine radiological examination of every patient before and after a course of convulsion therapy, and I am sorry to say that out of 101 patients, with 1,015 convulsions, we have had 21% of cases of fractured vertebrae. A more detailed account of these facts is in preparation for publication.

Finally, I must refer to the only valid criticism contained in Dr. McGregor's letter—namely, that faradic shock therapy is rather painful and unpleasant to the patient. I am of the opinion that it is no more unpleasant than chemical convulsant therapy, but some patients certainly do become apprehensive and express their dislike for the treatment in no uncertain terms. However, the unpleasantness *per se* cannot be regarded as a contraindication to any treatment, otherwise we would have to veto a large number of the routine manipulations of surgery. The important factor in every case is the therapeutic efficacy of the treatment, and if the results are good enough they may well justify a degree of unpleasantness far exceeding that of faradic shock therapy.

In conclusion, I would say that at the present time our ignorance in this field of shock therapy far outweighs our knowledge. We do not know how the convulsions are caused, we do not know why they produce therapeutic results, there has been no final evaluation of those results, nor do we yet know all the dangers of the treatment. This being the case, every investigation is welcome which attempts to throw light on the problem. And the results of such an investigation should be criticized in a scientific manner, in order to distil from them whatever small particle of truth they may contain. —I am, etc.,

Birmingham, April 15. GERALD CAPLAN.

Treatment of Scabies

SIR,—The aetiological agent of scabies is the itch mite, or acarus. The acarus lives upon the skin, which is penetrated only by the female parasite. The male dies after copulation and the female after the ova (fifty in number) are laid. In four to eight days the larvae are hatched and the cycle from egg to adult takes seven to thirteen days.[1] The ova are laid in burrows in the epidermis, and the larvae on hatching bore into the sides and floor of the main burrow.

The parasiticide must be brought into contact with the ova, larvae, nymphs, and parasites, or these must be removed mechanically in order to effect cure. This is materially assisted by using a soap, such as soft soap, with an oleate or stearate of potash, which is a strong keratolytic.

The classical treatment of scabies uses sulphur as the parasiticide, but opinions vary as to the strength to be employed. Roxburgh[1] advises 5 to 10%, Andrews[2] 10 to 15%, and Hoffmann[3] 25%. The customary course takes three days. Modifications of the sulphur treatment have been used, such as mitigal and kathiolan. The treatment with sulphur has in recent years been to some extent superseded by benzyl benzoate (a distillate of balsam of Peru). The benzyl benzoate is prescribed with equal parts of soft soap and isopropyl alcohol. A course of this treatment takes twenty-four hours. A rotenone preparation has recently been put on the market. This treatment requires two and a half days.

The aim in the treatment of scabies is the achievement of cure in the shortest time possible without the production of dermatitis medicamentosa. It is an established fact that sulphur will produce dermatitis, but this should not occur if the treatment is limited to three days. It is claimed[4] that the benzyl benzoate treatment, lasting for one day only, is free from the danger of dermatitis, and it was hoped that similarly the rotenone preparation would not cause irritation in the two and a half days required for treatment. In my own experience I have found that sulphur will produce a cure in three days, and that with few exceptions there is no following dermatitis. In the case of the rotenone preparation, however, two and a half days' treatment appears almost invariably to give rise to dermatitis. Benzyl benzoate treatment if limited to twenty-four hours is apparently free from following dermatitis. I am not satisfied, however, that a cure is achieved. The reason for this statement is that I cannot conceive, nor have I found in practice, that all the ova, larvae, nymphs, and parasites are reached by the parasiticide. As the larvae are in subsidiary burrows running from the main burrow, it seems to me impossible that all these subsidiary burrows are opened up and all the larvae killed. If some larvae remain untouched they will mature, and only if treatment is continued will they in their turn be killed. It is not the strength of the parasiticide that is important but its power of penetration. I believe that it would be illuminating to compare a series of cases treated with benzyl benzoate with one treated with sulphur, both over a period of twenty-four hours.

In conclusion I should mention that any twenty-four-hour treatment must be very thorough, and the preliminary bathing and breaking down of burrows must be effectively carried out. This appears to me to be difficult of attainment in ships at sea. On the other hand, any three-day treatment, depending to some extent on the maturing of the parasite, does not necessarily have to be so carefully done, nor is the bathing of immense importance. This type of treatment is, I feel suitable for use at sea.—I am, etc.,

R. WORKMAN CARSLA
April 7. Surgeon Lieutenant, R.N.

[1] Roxburgh, A. C. (1937). *Common Skin Diseases*, 4th ed., Lewis, London.
[2] Andrews, G. C. (1938). *Diseases of the Skin*, Saunders, Philadelphia.
[3] Hoffmann, E. (1937). *Die Behandlung der Haut- und Geschlechtskrankheiten*, Marcus and Weber, Berlin.
[4] King, R. E. (1940). *British Medical Journal*, 2, 626.

National Wheatmeal Bread

SIR,—There is to be found in this week's *Radio Ti* excellent half-page advertisement of the virtues of the grain flour. It is brief; it is non-technical; it is written: it is issued by the Ministry of Food. It end the words, "Order it from your baker." How encou when advertisers recommend to our people their an food and not the output of the patent medicine facturers. But how disappointing to find that the ba not "playing," for a tour of the bakers' shops aski national wheatmeal bread and quoting the Ministry of produced answers thus: (1) I am not baking this loaf; (brown loaf is practically the same; (3) There is no d for this. So now what? Is a good piece of public work to fail through non-collaboration at the retail end A little judicious canvassing by the profession would to be indicated here: a few kind words to the local b and in the houses of the patients a certain disapproval o mass of meaningless starch—the white loaf; a suggestio what was, until recently, the traditional food of E is a source of well-being and very pleasant to eat.—I am,

Henley-in-Arden, April 15. R. G. HOD

An Unusual Case of Diphtheria

SIR,—One of us (M. G.) was called out to a child, ag months, suffering from a "sore mouth." It had a tempe of 99.8°, and on examination a sore-looking sloughy patc seen surrounding the right central and lateral incisors. throat was absolutely clear. The patch did not look theritic, the face was not greyish, and there was, ir nothing about the case to suggest its true nature. The were discoloured at the point where the condition app to have started, which was not surprising, as the child been artificially fed and was somewhat rickety. The con was obviously not thrush, and a tentative diagnosis of Vin angina was made. Sulphapyridine was given, as it wa that the child was rather young for nicotinic acid. The condition improved markedly and the patient was obvi much better.

The case was so unusual and the appearance so unfan that the other of us was called into consultation. We unable to make up our minds definitely, although we felt that it must be either a Vincent's angina or an exte of some infection, probably streptococcal, from the mentioned. At this time the patch was roughly circular half an inch in diameter. It lay both behind and in fro the teeth. Diphtheria was considered, but, despite the gestive temperature, the general picture and the age of the virtually ruled it out. The same applied to thrush, the app ance alone settling the matter. We sent a swab from the sl to the county pathologist for examination, and were astoni to find that it yielded a pure culture of *B. diphtheriae*. further careful search was made for signs in the throat, there was nothing beyond a slight deepening of the usual colour. The child was given 20,000 units of antitoxin, and improvement which it was already showing on sulphapyri was much accelerated.

Neither of us is aware of another case like it; but we facilities for a search of the literature. We think that unusual site, the fact that it is the only case in a small t which was most thoroughly immunized by the County Med Services only last year, and that it was so atypical in appe ance make it worth recording. We see a fair amount diphtheria, much of it not typical, and we swab all thro in which there is any suggestion of a membrane or of follicu spots larger than the usual, however unlike diphtheria t may be. As the negative cases are usually streptococcal give sulphanilamide (or sulphapyridine if we think there mi be danger of pneumonia) in those which we judge to be diphtheritic, and antitoxin to the rest. Occasionally we wrong; but we have found that the drugs mentioned ha such a powerful curative effect on true diphtheria that when

get a positive diagnosis over the telephone the case is so much improved that we give antitoxin more as a matter of conscience than as a necessary remedy.—We are, etc.,

ANDREW KEFALAS, M.A., M.B
MAURICE GOLDIN, M.B.

Blaenavon, Mon.

Repair of Lacerated Eyes

SIR,—I read with great interest the paper by Mr R. Lindsay Rea (April 12, p. 555). The author of this ingenious operation is not Kuntze but Kuhnt. The success depends upon the flap of conjunctiva being not perforated. If the conjunctiva is torn, the bridge may be prepared with the base only being adherent, the top being free and being fixed to the raw or roughened wound of the eyeball. During the last war, in the Russian Army, I often had to operate on eyes where no conjunctiva was available or the conjunctiva was in a bad state as a result of trachoma. In my desperation I tried a free flap from the mucosa of the lips of the patient, carefully cutting away all fat and leaving only the mucosa and submucosa. The result was excellent and no infection followed. The submucosa surface, of course, is to be applied to the wound.—I am, etc.,

London, E.1, April 13. N. PINES.

Medical Planning Commission

SIR,—In this Division during the past months much time has been spent and will continue to be spent in general meetings of the profession and meetings of subcommittees in discussing the future of medicine. All members of the profession are invited to participate. By this means our knowledge and experience of the problems concerned are enlarged and our views are crystallized; we are in close touch with our local representative on the Planning Commission, who is thus kept informed of the opinions of his particular community, and it is proposed to submit any memorandum which may be drawn up as the result of our deliberations to the Commission and to publish it more widely. Apart from the benefits which we derive from these deliberations, and which we may be able to pass on to others, we feel that we are doing something to clear the ground for later action when those of our colleagues who are now away on Service return.

My committee has requested me to make this communication so that others—and especially those who are away on Service—may know that some constructive as well as destructive work is being done, and we have no doubt that similar work is being done in many other Divisions. The place of British medicine has always been high and in many respects unique. It is the responsibility of every member of the profession to contribute his part towards ensuring that changed social and economic conditions do not find us unprepared. There is such an abundance of work to be done that too many cannot be engaged upon the discussions and deliberations essential to the achievement of the best medical services.—I am, etc.,

JOHN T. INGRAM, M.D., F.R.C.P.,
Chairman, Leeds Division, B.M.A.

Leeds, April 15.

SIR,—The Chairman of the Council stated (April 12, p. 569) that the work of the Planning Commission will be tested as it proceeds "and the views of the Divisions and Branches will be invited before coming to any important conclusions." For this purpose it would be very useful if a summary of the data which the Commission and its committees use could be published in the *Journal* as soon as possible after they have been considered. This would give members time to weigh the evidence before meetings of Branches are held, and it would enable them to send to the Commission some information which might not otherwise reach it. The *Journal* might not be able to publish correspondence arising out of the summaries, but members would have a real chance to test the Commission's work by considering slowly—not hurriedly—the same evidence as the Commissioners.—I am, etc.,

London, W.1, April 15. J. M. ALSTON.

SIR,—In the weekly space devoted to the Medical Planning Commission it is a relief to note an increasing emphasis upon detailed suggestions likely to be helpful to the Commission as actually constituted. The Commission will, I feel, enjoy the fullest confidence of the profession as soon as its *modus operandi* is seen to be elastic and not hide-bound by precedent and tradition. Mr. H. S. Souttar in his reassuring letter (April 12, p. 569) voices the need for the fullest possible criticism of the Commission's findings whenever and however these come to be divulged; but he assumes too readily, in my opinion, that the ultimate submission of these findings to various branches of the profession and to B.M.A. Divisions will provide adequate discussion and consideration. The experience of many members with regard to two pre-war "reforms" does not bear this out: three years ago, over both the "Medical Service for the Nation" plan and the subsequent proposals for limited panels for medical aid in childbirth the profession as a whole was presented as nearly as possible with *faits accomplis*. In the former case the main details of the scheme were first seen by many doctors through public advertisements in the *Radio Times*, while in the latter the frantic eleventh-hour discussion which centred around "Ministry of Health Circular 1705" made it quite clear that the rank and file of medical practitioners felt they were being "sold," and in this they were loyally supported by their colleagues specializing in obstetrics and gynaecology. So much, then, for that method; it is unpopular here.

I feel strongly that the numerous complex problems raised by the present situation require the fullest possible ventilation in the light of day *before* any concrete proposals are put forward as well as afterwards. To say "the views of the Branches and Divisions have been fully consulted and are in agreement on all major points, etc.," is all very convincing in theory and, on paper, looks the height of democratic form and thoroughness; in actual fact, as a little anamnesis concerning the average B.M.A. Branch meeting on any vital issue will reveal, such a procedure is the very reverse of thorough. Need we so hastily condemn "the pathetic suggestion of a questionary"?

Without trespassing too freely on your valuable space I should like here to give vent to my own personal fears regarding the pitfalls of a State Service. I feel there is a real danger that all the bureaucracy of the present public health services will tend to be incorporated. Let me quote two examples: (*a*) Under the present E.M.S. arrangements surgical cases are transferred daily, often at an hour's notice, from beds in the voluntary hospital to a near-by municipally controlled hospital; yet, from this municipal hospital these same patients cannot be sent home for at least twenty-four hours after I have discharged them as fit. (*b*) Under the existing "inefficient" system, soon to be consigned to the museum of antiquities, a practitioner or surgeon is accessible, in person or by deputy, to all his patients for twenty-four hours a day and seven days a week untrammelled by a single inch of red tape. In many of the public medical services which have already invaded spheres of private practice the week-end and the bank holiday are as sacrosanct as in any shop or office, and—this is the vital point—but for the collateral operation of the old and tried "G.P." system the shortcomings of the newer service would have been more apparent than hitherto.

Finally, I think that the Commission as at present constituted and without access to *all* possible shades of opinion will tend to organize the new health services from specialist downwards instead of from the lowliest practitioner upwards. Let, therefore, our watchword be: "Seek ye first" the keen, observant clinician, unhampered by even as much bureaucratic control as under existing N.H.I. arrangements, with far better pay than under the present panel system (or, at any rate, with regional discrimination should capitation fees be adopted), a minimum of unessential clerical work and a maximum of opportunity for extending his knowledge and for applying his wealth of clinical material to scientific advancement; consummate this product of 3,000 years of patient evolution in every corner of the globe, the general practitioner; and you need have no fear for your hospital policy, your consultant and public health services, for "all these things shall be added unto you."—I am, etc.,

Huddersfield, April 14. W. E. THOMPSON.

SIR,—I believe that some of your correspondents are unduly disturbed about the high proportion of "consultants and specialists" appointed as members of the Medical Planning Commission. It has been my experience, acquired, I must

admit, very largely in the United States, that efforts to raise the standards of quality in medical care have usually come from men who have specialized. And the first consideration in planning the medicine of the future is that the quality of care shall be improved. This is the peculiar contribution which our profession is qualified to make. The administrative and economic aspects of medical care will, whether we like it or not, be largely determined by laymen. Since good medical care cannot be cheap, it will be an important function of your Commission to inform the public on the prerequisites of good care: the importance which we attach to hospital and laboratory facilities, and the need for every doctor to have access to these and to the opinion of his colleagues who have specialized whenever he feels such an opinion to be in the interest of his patient. Also we must insist on the importance of medical research.

I heartily agree that the younger members of the profession should be represented, since they have the greater stake in the future of our profession. If they are not adequately represented on the Planning Commission it is only reasonable to suppose that they will form their own organization and present, if they feel it necessary, their separate recommendations.—I am, etc.,

Delmar, New York, March 4. J. ROSSLYN EARP.

Safeguarding the Medical Services

SIR,—The maintenance of the medical services is of greater interest to the nation than is the welfare of individual practitioners. Only when the cumulative effect of an increased number of individual disasters threatens to jeopardize the efficiency of the services will the Government find reason for concern. In such case, what more natural course could it follow than take the whole profession under its wing and form a national medical service? The profession, in straits, would have little power to dictate terms.

Is it not the duty of those of us who have suffered little from the ravages of war to see to it that the position of the individual members of our profession is so secured that such a calamity becomes impossible. The steps so far taken to this end have been dictated by the experience of the last war, when it was discovered that absentee members suffered loss to the benefit of those who stayed at home. These measures have, for a variety of reasons, among which may be mentioned bombing and the migration of populations, come short of expectation. Some home members, for whom no provision has been made that is not subject to the haphazard of coincidence or accompanied by the stigma of charity, have suffered even greater loss than absentee members.

In this unprecedented situation the threat to the effective running of the medical services must be met with unprecedented, even novel and revolutionary, measures. The immediate threat is to individual members of the profession. But the maintenance of their welfare is as essential to the medical services as the care of the soldier is to the prowess of the battalion. As this is a matter in which the Government is interested, a claim to their co-operation in the following scheme is not unreasonable. The suggestion is briefly: That a demand for an additional percentage of his income-tax payment be made to each member of the profession (it does not seem likely that it will need to be a large one); that this additional payment go to the formation of a fund; that from this fund payments be made to medical men whose incomes, *ceteris paribus*, have fallen below a certain percentage of their pre-war incomes—say, below a half—to raise them to two-thirds (with certain limitations) or, alternatively, to ensure to each member a subsistence.

Such a scheme has the virtue of: (1) Being simple, unerring, and fair in its exaction of tribute. (2) Calling for no casuistry on the part of the home practitioner in determining between *meum* and *tuum* in his relationship with the absentee practitioner. (3) Affording more prospect than the present arrangement of a livelihood to the absentee on his return, and giving it to the home practitioner also (the retention of practices being dependent now not only upon the attitude of patients but also upon their migration). (4) Covering all grades of the profession—consultants, specialists, G.P.s. (5) Making more easy the transfer of anyone to the E.M.S., whether that transfer become necessary through national emergency or personal straits. (6) Abolishing the humiliation of receiving charity. (7) Protecting the profession from an impoverishment that might make it (or, at any rate, many of its members from necessity and others from commiseration) too ready to accept a national medical service that meets the requirements of an oligarchy of statisticians rather than the taste of the public and the profession itself. (8) Compensating the Government, via the Exchequer, for the clerical work entailed through the extra income it gathers from the taxation of the amounts allocated.—I am, etc.,

Glasgow, April 18. W. MELVILLE CHRISTIE.

Medical Man-power

SIR,—With reference to your leading article (April 12, p. 559) dealing with the very important question of our decreasing medical reserves, might I suggest that pooling of the talents of medical men and women in the civil and fighting Services is often possible, and that this would go a long way to solving our difficulties.

Fully and partially mobilized medical units are often stationed for considerable periods in the vicinity of towns with large and under-staffed civil hospitals. These units, comprising many hundreds of medical men, are for the most part in reserve and not functioning in a medical capacity. Their officers, separated from clinical work, tend to become bored, and, with the passage of time, their efficiency suffers. If they were temporarily attached to civil hospitals they would supply a pressing need and at the same time maintain unimpaired their clinical capacity. A few officers would have to be retained at their units for administrative purposes; the training of the medical personnel as a whole could be kept up by short concentrated courses, and their services lent when not so engaged.

A major objection to such a procedure might be that such units must be prepared at short notice to proceed to a theatre of war. Such a difficulty could be overcome by other units in the process of formation taking over the civil functions of their predecessors, or, where this is not possible, a pool of senior medical students could be on tap to fill the junior vacancies during the period of transition.

Doubtless there are many other ways in which co-operation could be effected, but the procedure outlined above, owing to the large numbers of medical personnel involved, should prove important.—I am, etc.,

Hatfield, April 14. H. L. DUNN.

Nurse Anaesthetists

SIR,—Mr. F. MacG. Loughnane (March 22, p. 463) has upheld the nurse anaesthetist. Surely, without any adverse criticism of the nursing profession, to hail the advent of the nurse anaesthetist to the hospitals of this country is a retrograde step. The calling of the anaesthetist specialist is an essential one. Those who have seen the tragedies and the difficulties which result from the badly administered anaesthetic, the tired anaesthetist flustered and perspiring, know that for the safety of the patient and the smooth working of the theatre the expert is an essential. I have found that the better the surgeon the greater the recognition given to the anaesthetist.

The surgeon's income is not derived alone from the operations he performs, but from consultations, examining students and graduates for higher degrees, arbitration on accident cases, etc. The anaesthetist who gives his whole time to his specialty has only the private anaesthetic from which to derive his income, and is lucky if he can claim one-tenth of the surgeon's operation fee. In many cases the necessity to augment the income by private general practice is the sole reason why the anaesthetist cannot undertake all hospital work.

The answer is that if anaesthesia is to be efficiently undertaken in hospitals the hospital authorities must pay the anaesthetist a reasonable salary, not £20 or £50 a year, as some do. The anaesthetist can then give his whole attention to his very important work; not only important to the patient, but also to the student, who so often learns to anaesthetize by his mistakes rather than by the advice of his teacher, and the surgeon, assistant surgeon, and clinical tutor would have a "real necessity", and not a "luxury" as Mr. Loughnane terms the specialists in anaesthetics.

Milton treatment of wounds

This treatment proceeds by three stages:—

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Thorough cleansing and mechanical removal of all infected plasma proteids, necrotic tissue and pus. Milton (up to 50% solution) dissolves this detritus and rapidly sterilises the clean surface. As a hypertonic saline it produces profuse fluid exudation.

> *"The process of mechanical cleansing is of "most advantage in wounds containing sloughs "and is well served by solutions containing "chlorine or liberating oxygen, both of which "tend to disintegrate and detach necrotic "tissue."—Lancet, May 4, 1940.**
>
> *"The most rapidly acting antiseptics are the "halogens and those liberating nascent "oxygen."—Lancet, April 27, 1940.**
>
> *"Profuse fluid exudation can be deliberately "produced by applying hypertonic solutions "of salt."—Lancet, May 4, 1940.**

2. MILTON 5% SOLUTION

The clean wound is kept sterile by an isotonic antiseptic protective layer, applied by dressing, irrigation or immersion. In this mild aqueous medium a normal granulation proceeds and exudation ceases.

> *"The proper vehicle for an antiseptic to be "applied to a wound is water, and the solution "should if possible be rendered isotonic."—Lancet, May 4, 1940.**

3. MILTON ½% SOLUTION

The Milton is then reduced to ½ per cent., at which dilution the hypochlorite has been found to actually stimulate cell-division and tissue-growth, with consequent rapid healing. After débridement, this course of treatment is normally painless.

This therapy cannot be carried out with full success by the use of Dakin's solution or of Liq. Sod. Chlorin., owing to their causticity, their deficient saline content and to their varying strength of hypochlorite.

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Action of Antiseptics on Wounds.

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THE TREATMENT OF INFECTION IN WOUNDS BY SULPHONAMIDES

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Great attention has recently been attached to a form of topical sulphonamide therapy in which a relatively large amount of the compound is placed inside a wound and allowed to remain there.

The clinical and experimental data available on the subject is at present inadequate for the proper evaluation of sulphonamide implantation, but articles already published in the medical press clearly show that it is not a procedure which can be dismissed without further consideration.

We have prepared a memorandum summarising the data at present available on the subject and presenting a critical review of the position. We will be pleased to send a copy to you on request.

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In the operating theatre the patient comes first. It is the patient's life which is in danger, so often from the anaesthetic and so seldom from the operation, and good anaesthesia is essential. An anaesthetist should be able to administer every type of anaesthetic, take charge of the patient should any incident arise, and should, in my opinion, feel competent to open the abdomen in order to carry out cardiac massage if need should arise. There are "ear and throat" and "eye" surgeons who, on their own admission to me, have never opened an abdomen, and ear and throat operations have a way of causing respiratory difficulties on occasions. To be competent to do this is asking a great deal of a young doctor and too much of any nurse. Anything less than this competence would tend to lower the already too slow increase in prestige which is due to the specialist anaesthetist.—I am, etc.

April 2. A. M. DUFF, Lieut.-Colonel, R.A.M.C.

SIR,—May I add one more opinion in favour of nurse anaesthetists from the surgeon's point of view. In America two years ago I had an opportunity of watching carefully the administration of anaesthetics by nurse anaesthetists in some of the most important surgical clinics there. The skill and efficiency of these technicians were remarkable. I have not seen in any European country such an all-round high standard. The objection to the present system in Great Britain and Ireland has been partially referred to by Mr. F. MacG. Loughnane (March 22, p. 463), where he stated that anaesthetists should attend at every hospital operation list. What about emergency operations, which frequently demand the greatest skill on the part of the anaesthetist as well as the surgeon? It was a rather uncommon occurrence in my student days—and probably is to-day—to see the official anaesthetist attending for emergency operations. It was found on those occasions that the house-surgeons could "carry on," yet on the mornings following, when the anaesthetist was in attendance, the house-surgeon had apparently lost the inspiration which Providence had bestowed on him the previous evening when it was not convenient for the anaesthetist to attend.

There are few branches of medicine more important and certainly none more neglected than anaesthetics. The position is bad enough in teaching hospitals, but is worse in hospitals situated in small centres like the county hospitals in Ireland, where, in many cases, the administration of anaesthetics is the *duty* of house-surgeons, who may be newly qualified, untrained doctors. I, personally, have performed operations with a doctor as anaesthetist who had never given an anaesthetic previously. I can go further and state that patients have died at operation, and I did not feel too sure that death was not due to an overdose of anaesthetic. The latter is a very difficult thing to prove, and no doctor wants to prove it. This system, it will be observed, is permitted in local government hospitals in Ireland, where the standard of anaesthesia is exceptionally poor.

Whatever may be said by doctors against nurse anaesthetists, I think few of us would voluntarily agree to an operation on ourselves with an untrained doctor giving an anaesthetic; on the other hand, few of us who have seen these technicians work would refuse an anaesthetic at their hands. There is an obvious economic difficulty in appointing doctors as anaesthetists to every hospital, particularly in small centres, but it seems to me that the sooner nurse anaesthetists are appointed in every hospital, with or without a doctor anaesthetist, the better for our patients and public health; we shall have far less "post-operative complications" and a reduction in "operative mortality."

I congratulate the Board of Addenbrooke's Hospital on their enterprise in appointing nurse anaesthetists; their action will be welcomed by the great majority of surgeons who, like myself, have not the "luxury" of special anaesthetists. None of us will deny the need for special anaesthetists and for research work in anaesthesia in suitable centres. The appointment of nurses who are competent to give anaesthetics will not hinder progress. On the contrary, it will produce a far wider use of several anaesthetics available to-day (but which we do not use); it will supplant the present deplorable system in many of our hospitals; and provide surgeons and patients alike with an essential now long overdue.—I am, etc.,

Croom, Co. Limerick, April 3. J. F. O'CONNOR, F.R.C.S.I.

The Services

COLONEL COMMANDANT, R.A.M.C.

Major-General H. P. W. Barrow, C.B., C.M.G., D.S.O., O.B.E., late R.A.M.C. (ret.), has been appointed Colonel Commandant, Royal Army Medical Corps, from August 27, in succession to Major-General R. S. Hannay, C.B., C.M.G., D.S.O., late R.A.M.C. (ret.), who has attained the age limit.

CASUALTIES IN THE MEDICAL SERVICES

INDIAN MEDICAL DEPARTMENT

The name of Lieut. E. A. COTTON is included as "Died" in an India Office Casualty List published on April 16.

INDIAN MEDICAL SERVICE

Wounded

Captain Charles Westland Greene
Captain H. C. Rogers.

DEATHS IN THE SERVICES

Colonel THOMAS BOSWELL BEACH, C.M.G., C.B.E., late R.A.M.C., died at Reading on April 3, aged 74. He was born at Brompton on May 28, 1866, the elder son of the Rev. Canon W. R. Beach, Chaplain to the Forces, and was educated at Bloxham and at King's College Hospital, where he gained the Warneford Scholarship and worked under Lister. He took the M.R.C.S., L.R.C.P. in 1889 and, after serving as house-physician at King's, entered the Army as surgeon in 1891, passing first both into and out of Netley. There he gained the Herbert Prize allotted to the best man of the term and the Montefiore Medal and Prize for Military Surgery. He became lieutenant-colonel in 1912, colonel in 1915, went on half-pay in August 1919 and retired four months later. He served in the South African War in 1899-1902, when he took part in the advance on Kimberley, including the actions at Belmont, Enslin, Modder River, and Magersfontein; and in operations in the Orange River Colony, including the actions at Paardeberg, Poplar Grove, Driefontein, Vet River, and Zand River; in the Transvaal, in the actions at Pretoria, Johannesburg, and Diamond Hill; and in Cape Colony. He was mentioned in dispatches in 1901, received the Queen's medal with seven clasps and the King's medal with two clasps, and was promoted major. In the war of 1914-18 he was mentioned in dispatches in 1916 and received the C.M.G. in the same year and the C.B.E. in 1918, after serving as A.D.M.S. at Alexandria. He had been a member of the British Medical Association for fifty years.

Lieut.-Colonel AUSTIN ROWLAND O'FLAHERTY, R.A.M.C. (ret.), died at Westward Ho! on April 8, aged 71. He was born on February 7, 1870, received his medical education at the London Hospital, and took the L.S.A. in 1897 and the M.R.C.S., L.R.C.P. in 1901. Entering the R.A.M.C. as lieutenant in 1898, he became lieutenant-colonel in 1915, and retired in 1921. After his retirement he was for many years in practice at Torrington, Devon, where he was surgeon to the cottage hospital and a member of Great Torrington Borough Council, serving as mayor in 1927-8. He served in the operations in Sierra Leone in 1898-9 (medal with clasp); in the latter part of the South African War in 1902, in operations in Cape Colony (Queen's medal with three clasps); and in the war of 1914-18, when he was mentioned in dispatches in 1917. He had been a member of the British Medical Association for thirty-nine years and was chairman of the Barnstaple Division in 1929-30.

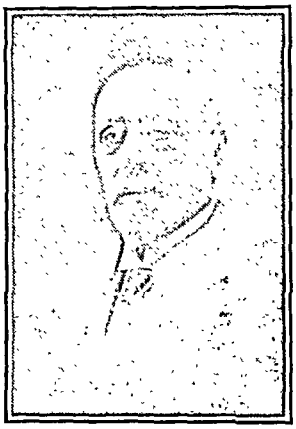
Lieut.-Colonel PERCY HILDEBRAND COLLINGWOOD, R.A.M.C. (ret.), died at Bristol on April 11, aged 60. He was born at Deesa, India, on April 2, 1881, received his medical education at St. Thomas's Hospital, and took the L.S.A. in 1897. Entering the Army as surgeon lieutenant in 1898, he became lieutenant-colonel in 1915, and retired in 1922. He served in the Nile campaign of 1898, receiving the medals and the Egyptian medal, and in the operations in 1903-4 in the Aden hinterland, where he was senior medical officer. He had been a member of the British Medical Association for seventeen years.

We have received from Messrs. Davis and Orioli, 1, St. Martins Street, Wallingford, Berks, a copy of their catalogue (No. 98) of historical books on genetics, evolution, and heredity, from the collection of Prof. R. C. Punnett, F.R.S., who has lately retired from the chair of genetics at Cambridge.

Obituary

PROFESSOR M. HAJEK

Prof. Markus Hajek, the famous laryngologist, whose death at the age of 79 we announced on April 12, was one of the most popular figures at international congresses, and one of the most popular teachers in the medical world. When, after having attained the legal age limit, he had to resign his clinical position, a special volume of the *Monatsschrift für Ohrenheilkunde*, etc., was dedicated to him; it contained 150 contributions by authors all of whom were former pupils of Hajek. The following appreciation is from the pen of a British colleague:



With the death in London of Prof. Hajek there passes the last of the professors of laryngology who made Vienna the Mecca of that specialty, ever since Türck in 1858 demonstrated the clinical application and value of Garcia's invention of laryngoscopy in 1855. Türck instructed Morell Mackenzie in the new art, and his beautiful album of water-colour drawings of the laryngeal conditions it rendered visible were piously shown to successive generations of students down to our own days. He was succeeded by such pioneers in the art as Schrötter, Stoerck, and Chiari. When the two chairs of laryngology were amalgamated with the two of otology—made famous by the work of Politzer and Gruber—one of the clinics of oto-laryngology was put under the direction of Hajek and the other under the popular and successful Neumann, who died recently in New York, also, like Hajek, an outlaw and an exile from their beloved Vienna.

In the nineties of last century Hajek began his career as assistant in the Poliklinik to Schnitzler, whose daughter became his devoted wife. His brother-in-law was the well-known dramatic author Arthur Schnitzler. It was at the Poliklinik that Hajek laid the basis of his life's work, by making the beautiful dissections of the anatomy of the nose and accessory sinuses which he demonstrated to his large class of students, often composed of numbers of English and Americans. Zuckerlandl's classical work on nasal anatomy, and Onodi's atlas of the same subject, had then been published, and these works and Hajek's teaching were the principal factors in spreading the knowledge of this region of the body, which until the end of last century had been only incompletely explored. Hajek, in his lectures, did much to demonstrate the clinical importance of personal and direct acquaintance with the anatomical arrangements and the frequent irregularity of this region, where danger and disaster are so ready to attend any mistaken route or any intrepid interference. His class was held at 8 o'clock in the morning, and was always full. It was followed by his clinic.

He taught with enthusiasm and with great clearness of demonstration, urging his pupils to seize every opportunity for handling wet specimens, of making their own collection, and inviting them always to note the frequency in the size, shape, and extent of the paranasal cavities, as well as the occasional absence of one or more of them. During these years he was also accumulating the material for his classical work on diseases of the nose. His large publication on diseases of the larynx—which has been translated into English—was based on later work when he had left the Poliklinik for the Allgemeines Krankenhaus. Here he remained, teaching gradually dwindling classes during the post-war period. Hajek visited London when he delivered the Semon Lecture in 1928. He foresaw the clouds gathering for the second great war. Years ago he told the writer of this notice that Austria must inevitably fall into the clutches of either Germany or Russia. When the first of these catastrophes fell on Vienna, and the savage ill-treatment of the Jews started there, he appealed for help to this country. His fellow laryngologists and his old pupils here, as well as in Canada and America, enabled Hajek and his wife to reach London in 1938. The whole amount of money they were allowed to bring out of Austria was 10 marks each, and the only gold permitted was that of their wedding rings. He had to dispose of his gold watch before leaving Vienna. Among the few personal belongings he carefully brought over were some of his original anatomical specimens, which he gratefully presented to the Museum of the Royal College of Surgeons. The library there also accepted some original notes of his lectures made by a visitor to the Poliklinik in 1893. He arrived here broken in health, but his dwindling years were made as comfortable as circumstances would permit. He was most appreciative of his reception and of his welcome in the Section of Laryngology of the Royal Society of Medicine, of which he was one of the few Honorary Members. It was touching to hear how cheered he was simply by the sense of freedom and liberty in this country, explaining that this was daily shown by his being permitted to sit down on any seat, in any public park or garden, without being driven off by a member of the Gestapo.

Hajek was not commercially minded. His enthusiasm was for research, for writing, and particularly for attracting and teaching students. This teaching was made welcome by his evident eagerness to demonstrate the importance of intimate knowledge of anatomy in the practice of our art. In his work, his writings, and the inspiration of his pupils he was what the French call "*un grand maître*." It is distressing to think that the last two professors in what used to be the most famous school of laryngology in the world were driven from Vienna to die in exile. We have some little comfort in recollecting that they found welcome shelter in the two great democracies.

SIC. T.

DAVID FORSYTH, M.D., D.Sc., F.R.C.P.

Consulting Physician to Charing Cross Hospital

We regret to announce that Dr. David Forsyth, for many years physician to Charing Cross Hospital and the Evelina Hospital for Children, died on April 10 at his home in Weymouth Street. He was a general physician who made a special study of childhood and whole-heartedly embraced the doctrine and technique of psycho-analysis.

David Forsyth, son of Alexander Forsyth, M.D., was born at Greenwich on November 24, 1877. He studied medicine at Guy's Hospital and won the Rogers prize of the University of London after graduating in medicine in 1902; he took the M.D. degree in the following year and the D.Sc. in 1908, and became a Fellow of the Royal College of Physicians of London in 1910. After serving as demonstrator of physiology at Guy's he was elected to the visiting staff at Charing Cross and later at the Evelina Hospital, and for many years worked in the out-patient department and wards of both institutions. As a teacher at Charing Cross Dr. Forsyth made friends with generations of students and won their affectionate regard. He was a past-president of the Section of Psychiatry of the Royal Society of Medicine, and after the last war served as senior physician to the Psychiatric Clinic of the Ministry of Pensions. He was a member of the Child Study Society, the British Psychological Society, and the International Psycho-Analytical Association. His earliest book was *Children in Health and Disease*, published in 1909; *The Technique of Psycho-Analysis* followed in 1922, and *Psychology and Religion* in 1935. Among his many papers on the mental aspects of health and disease may be mentioned those on



diagnosis of neurotic conditions in general practice published in the *British Medical Journal* and on the psychological effects of illness on children published in the *Lancet*, also contributions on psycho-analysis to the *British Journal of Psychology* and the *Psycho-Analytical Review*. He was the author of a paper on the care of children under school age in the *Journal of State Medicine*, a report to the Ministry of Health on the mental health of the child, and of sections on the medical inspection of children in the City of Westminster Health Society's annual reports 1912–16.

"M.B." writes:

It must have needed great courage, twenty-five years ago, for a physician in a teaching hospital publicly to declare himself favourable to Freud's doctrines. All medical circles would nowadays accept (with more or less graciousness) much that formerly provoked ridicule and contumely. Such prejudice Dr Forsyth was willing and able to bear, and consequently generations of students were enabled to diagnose and appreciate the "psychogenic" symptom many years ahead of accepted teaching. Forsyth's uncompromising advocacy of clear and progressive thinking inevitably led to some unpopular conclusions concerning not only medicine, but politics and religion also. While not insensitive to *public feeling, his battling with custom, prejudice, and disease* remained unmodified. Hospital work offered no scope for the psycho-analytic therapy in which he excelled, so that it is left, perhaps, even more to his patients than his colleagues to appreciate the fineness of his therapeutic gifts, his soundness of judgment, and his integrity. His loss will touch many people very deeply.

[The photograph reproduced is by Elliott and Fry, Ltd.]

A. STANLEY GRIFFITH, C.B.E., M.D.

We regret to announce the death on April 9 of Dr. A. Stanley Griffith, whose important scientific studies of tuberculosis earned him the Weber-Parkes prize and medal of the Royal College of Physicians in 1927. He had lived for many years past at Newnham Croft, Cambridge, working at the University Field Laboratories as a member of the scientific staff of the Medical Research Council.

Arthur Stanley Griffith was born in 1875 and graduated M.B., B.Ch. of the Victoria University, with honours, in 1897, whereupon he was awarded the Derby exhibition at the Liverpool School of Medicine. In 1901, after holding for two years the Alexander Fellowship in Pathology at the Thompson Yates laboratory in Liverpool, he proceeded M.D. and obtained the D.P.H. of the English Royal Colleges. Stanley Griffith's quality as a bacteriologist then found recognition and congenial employment for seven years (1903–10) as resident scientific investigator under the Royal Commission on Tuberculosis; when that task came to an end with publication of the Commission's final report he continued to work at his subject with a Grocers' research scholarship, and held this for three years until he joined the scientific staff of the Medical Research Committee, as it was then known. The University of Cambridge gave him the Ph.D. degree in 1926, and his services to medical sciences and public health were publicly acknowledged by the award of the C.B.E. Stanley Griffith was a member of the Pathological Society of Great Britain and had been a member of the British Medical Association for forty-one years.

Sir Arthur MacNalty writes:

In 1900 Koch startled the world by his announcement that bovine tuberculosis was comparatively harmless to man. The British Government set up a Royal Commission to investigate the subject. Their chief workers at the Commission's experimental farm were Arthur Eastwood, a distinguished pathologist, and two young brothers, A. Stanley and F. Griffith, whose investigations at the Liverpool School had already revealed their brilliance and skill as research bacteriologists. In 1909, when resident medical officer at Brompton Hospital, I supplied material for the Royal Commission's investigation. It was then that I made the acquaintance of A. Stanley Griffith and his brother, an acquaintance which soon ripened into friendship in the years of co-operative work which were to come. The work of the Royal Commission, recorded in its reports, proved the pathogenicity of bovine tubercle to man. Much of this conclusion was due to Stanley Griffith's admirable technique for isolating and identifying bovine strains of the tubercle bacillus, and all the workers enhanced their scientific reputations. The Royal Commission's work finished, Eastwood and F. Griffith accepted appointments in the Pathological Laboratories of the Local Government Board (afterwards the Ministry of Health), and Stanley Griffith continued his research work on tuberculosis as a whole-time worker for the Medical Research Council at the University of Cambridge Field Laboratories, Milton, near Cambridge. As organizer and secretary of the Tuberculosis Committees of the Medical Research Council, I found his help and advice of the greatest possible value in investigating the many problems which came before these Committees.

Stanley Griffith whole-heartedly devoted himself to typing the tubercle bacilli found in various forms of non-pulmonary tuberculosis. In 1937 he reviewed the position in *Tubercle* (August issue, pp. 529–43) and gave a comprehensive table showing the percentage of cases infected with the bovine type of bacillus, the result of some twenty-six years' intensive and meticulous work. Some years previously W. T. Munro had drawn my attention to his discovery of bovine types of the bacillus in cases of pulmonary tuberculosis in Scotland. Dr Munro and Griffith worked at this problem together, and in 1938 the latter (in a paper with Smith) showed that 9.1% of 342 pulmonary cases from rural and small urban districts in the north-east of Scotland and 4.4% of 294 pulmonary cases from the City of Aberdeen yielded tubercle bacilli of the bovine type (*Lancet*, 1938, **1**, 739). In addition to this laborious work Griffith worked with Prof. J. B. Buxton on B.C.G., and was the author of important reports to the Medical Research Council on this subject.

Stanley Griffith was a stern critic not only of other men's work but of his own. He had a high standard of scientific excellence in the light of which he worked. He "shunned delights and lived laborious days," often, one fears, at the expense of his own mental and physical powers. Tall and thin, with clear-cut intellectual features, he was modest and retiring and the kindest of men. His published papers, fundamental as they are, reveal but a tithe of the great knowledge he possessed of the bacteriology of tuberculosis. Of late years he had broken down in health, and the end when it came was a source of sorrow but no surprise to his friends.

Since writing this the sad news has come that F. Griffith and W. M. Scott, my former colleagues at the Ministry of Health, have been killed by enemy action. F. Griffith wrote to me a few days ago about his brother's patience during his long illness. The brothers were devoted to one another and in death they have not been divided.

DUDLEY M. STONE, M.R.C.S.

Senior Assistant Medical Officer, *X*-Ray Department, St. Bartholomew's Hospital

We regret to announce that Dr. Dudley Macaulay Stone, well known for his work in radiography, died on April 15, after a long illness.

He was born in London on March 3, 1881, the son of John H. Stone, M.A., F.L.S., and from Bedford School entered St. Bartholomew's Hospital, where he became very popular and distinguished himself at football and other sports. He was also an expert yachtsman, and his skill in photography went far beyond that of an amateur. After qualifying M.R.C.S., L.R.C.P. he worked as house-surgeon at the Metropolitan Hospital and then began to specialize in radiology, becoming medical officer in charge of the *x*-ray department of the City of London Hospital for Diseases of the Chest and radiologist to St. Paul's Hospital. Throughout the last war he served in France, with a number of Bart's friends, at Le Touquet, where he had charge of the *x*-ray and electrotherapeutic departments of No. 1 British Red Cross Hospital. His mastery of the technique of photography had been recognized by Dr. Lewis Jones and Dr. Hugh Walsham while he was a student, and on returning to civil life after the war he rejoined

the *x*-ray department at St. Bartholomew's as chief assistant. In private practice in Harley Street, Dudley Stone gave valued help to the patients of many colleagues, medical, surgical, and dental. Among his few published papers was one on a method of preventing dust from getting between the fluorescent screen and the lead glass, written for the *Archives of Radiology and Electro-Therapy*.

K. M. W. writes:

Dudley Macaulay Stone's death at the age of 60 removes from St. Bartholomew's Hospital a familiar figure. For forty-two years "Dobbs" has been seen there, ever since he entered King Henry the Eighth's gateway as a student of 18 fresh from Bedford Grammar School. Only during the four years of the last war was he absent from Bart's, when he was serving as radiologist to the Duchess of Westminster's Hospital at Le Touquet. Indeed, Dobbs was very rarely absent from duty. If he had not adopted a medical career he would have found a congenial career in the Navy. He had that devotion to duty, that thoroughness in the discharge of anything he had undertaken, which are characteristic of most sea-going men. And the sea had a strong fascination for him. He sailed his yacht with the same mastery with which he manipulated his *x*-ray plant. No slipshod methods were tolerated on board, as the writer, who once undertook the washing-up of plates in the forecastle, can well testify. High standards were set by the skipper and expected also of the crew. (The plates were rewashed.)

Stone could have made a success of several careers, among others as a business man. But there is no doubt that he selected the right one. Keenly interested in all forms of apparatus and a first-class amateur photographer, the growing *x*-ray department of the hospital claimed him as naturally as a pond claims a duckling. He neither attempted nor achieved any high medical distinction, for practice was of more importance to him than theory. And what an immense amount of work he got through without any fuss or bother! Nobody ever saw him ruffled, nor did the humorous glint ever depart from his eye. An extra barium meal on a morning that was already overcrowded was, after all, only a trifle. It had to be done and it *was* done. He will be more difficult to replace than many a man with glittering academic distinctions.

And he will be missed in other circles than that of St. Bartholomew's, for he was a man of many hobbies. Yachtsmen, philatelists, and business men alike will feel that a "character" has disappeared from among them. Stories will be retold, reminiscences of old Stone exchanged, memories of good times together revived. Good-bye, Dobbs. You would never have liked the usual platitudes in your obituary notice. You liked the plain unvarnished truth.

J. GRAHAM FORBES, M.D., F.R.C.P.

We regret to announce the death on April 8 of Dr. J. Graham Forbes, late Senior Medical Officer in the Public Health Department, L.C.C. James Graham Forbes was educated at Cambridge and St. Bartholomew's Hospital, qualifying M.B., B.Ch. in 1898; he proceeded to the M.D. in 1901, taking his D.P.H. in the same year. In 1904 he took the M.R.C.P., and was elected to the Fellowship in 1920. Dr. Forbes was house-physician and assistant demonstrator in pathology at St. Bartholomew's, and clinical pathologist and bacteriologist to the Hospital for Sick Children, Great Ormond Street. Among his publications was the well-known *Diphtheria, Past and Present: its Aetiology, Distribution, and Prevention*, published in 1932. We are indebted to a former colleague for the following appreciation:

The outstanding features of Forbes's character which were conspicuous in later life were those of individualism and drive, and these often made him a determined critic. These characteristics he no doubt owed to the fact that he was the son of a well-known high churchman and received his early education at Clifton. Although not of his year, I remember him as a medical student at Cambridge, where he belonged to a particular clique of students. Association, however, was more intimate in the dissecting room and in the histological laboratory, and here one was able to see the beginning of those characteristics which were so prominent in later life. I lost contact with him when he became a student at St. Bartholomew's Hospital, and association did not come again until he was pathologist at the Children's Hospital at Great Ormond Street. There is no doubt, however, that he continued his successful career at St. Bartholomew's. He held appointments there both of house-physician and of assistant demonstrator of pathology, and afterwards held various outside appointments such as surgeon to the Royal Blue Regiment, medical officer to the Anglo-French Boundary Commission, where he no doubt learned much of tropical diseases, and later again as assistant physician to the London Royal Chest Hospital. Physically Forbes never was strong, and it is surprising what an amount of energy and vigour he threw into his life's work in spite of poor health, which kept him away from duty for at least two long periods. Pathology and work in a laboratory were undoubtedly the types of work for which his mind was developed, and this is shown by the good work he did for the Children's Hospital, where he acted as their pathologist. One of his most valuable contributions as pathologist was his report on the prevalence of the gonococcus in the genitals of apparently healthy children admitted to the wards. It is a great pity that this report was never made public, for it would have saved the reputation of many doctors working in hospital and would have silenced the always too ready criticisms of lay members of hospitals, who obviously do not know anything of medicine and yet in their ignorance are only too ready to criticize and condemn the medical profession for ineptitude.

Most unwisely some of Dr. Forbes's friends advised him to give up pathology and become a school doctor under the L.C.C., for he had no interest whatever in administrative work, and the years he devoted to this task were no doubt wasted. In due time, however, an opportunity arose to transfer him to the County's Pathological Laboratory at County Hall, where he assisted the Principal Assistant Medical Officer in controlling infectious diseases in schools and carrying out the laboratory diagnostic work. It was here that he came into contact with the diphtheria control in schools. He very soon saw that diphtheria outbreaks in schools could not be controlled either by swabbing of contacts or by seclusion of carriers, and that the only remedy was universal artificial immunization of all susceptibles. From then on he made it his duty to preach this doctrine on every available occasion. Diphtheria control was the subject of his Milroy Lecture in 1929, and he made the amplification of this lecture his life's work, first in a publication by the Medical Research Council and finally in the publication of his monumental work on diphtheria, which to-day still holds the record.

Dr. Forbes retired from the Council service on attaining the retiring age in 1938, and his friends are happy to think that he was able to enjoy some three years of quiet and leisured life. To his friends he will always be remembered as a vigorous and outspoken critic on subjects of which he had made a deep and toilsome study.

EDMUND BARKER, L.R.C.P. & S.Ed., L.R.F.P.S.G.

For many years one of the best-known medical figures throughout the East Riding of Yorkshire, Dr. Edmund Barker died suddenly in his chair on April 10, having just finished his morning surgery.

A Yorkshireman in the truest sense, Dr. Barker was born at Hovingham 71 years ago and, although his father was a farmer, he came of a medical family, for his grandfather, Dr. Thomas H. Barker, was a noted surgeon of York. Before qualifying in Glasgow in 1895 he had been a medical student at Belfast and Leeds. He had previously served as a medical apprentice at Doncaster Infirmary and was for some time an unqualified assistant in general practice. When, therefore, he started practice in the Hessle Road district of Hull over forty years ago he was a man of very wide experience. His geniality and kindly interest in everything and everybody in his district gave him an amazing knowledge of the community among whose members he spent so long a period. Edmund Barker had an unsurpassed knowledge of the Yorkshire dialect, and his amusing tales of his experiences in practice will long be remembered by many of his colleagues.

For many years he took a very active interest in all things med[illegible] in the city. He was an original member of the Hull Insurance Committee and Local Medical and Panel Committee, of which he was chairman for some years. He was a past-president of the Hull Medical Society, and was a keen member of the British Medical Association until increasing difficulty in getting about compelled him to give up active participation in local medical affairs. He possessed a wonderful memory and was an exceedingly clear thinker; his advice was, therefore, frequently sought by his colleagues on difficulties in practice of all kinds. A unique tribute to his great popularity with his fellow practitioners was paid to him when he retired from committee work, for he was entertained to dinner and presented with a piece of plate to commemorate the occasion. He is survived by his second wife and his only daughter, who is the wife of Dr. Stanley Worthington of the Ministry of Health Regional Medical Service.

Edmund Barker, writes "J. N.," was known as one of the oldest doctors still in active practice in Hull. And in his practice he always was active and energetic. He took considerable interest in medical politics, from the time when he was a participator in "the battle of the clubs" when in practice in Northumberland down to the early stormy days of the National Health Insurance Act. When panel practice was an accomplished fact he became a member of the Hull Panel and Local Committee. He also served on the local Insurance Committee up to his retirement from all committees a few years ago. He was a good committeeman, though not a particularly good speaker. His own way of putting it was that he was all right sitting at a table and talking: but that when he had to stand up he was too nervous to be any good. Barker was versatile in his tastes and temperament. He exhibited many of the best characteristics of the good Yorkshireman that he was. In business matters keen and a good bargainer; in his personal and social side hospitable, generous, and ever ready to help lame dogs over stiles. He loved the company of friends, and being a good raconteur, with a great fund not merely of tales and stories but of general knowledge, his friends found in him a good companion. He was largely a follower of Belloc and Chesterton; and loved the old-fashioned country inn far above any of the modern monstrosities with plush and chromium decorations, and was a genuine authority on the old inns of the North of England. He had many tastes, interests, hobbies. A good botanist, he had specialized to a considerable extent in the study of ferns. Like many brought up in the country, he knew much about bird life, not so much from the scientific point of view as from the aesthetic side. He was a good fisherman; and when he practised in Northumberland was a member of the Conservancy Board, on which he did good work for the preservation of piscine life and the care of trout and other streams. In fact, he was interested in almost every aspect of country and outdoor life: and for anyone who had similar tastes he was a delightful and instructive companion. In the more quiet aspects of life he had also many interests. He had been an ardent philatelist. He was well and widely read, his knowledge of the literature of Yorkshire especially being extensive; while he was devoted to certain types of Irish literature, and books dealing with that country—which he loved best after his own native Yorkshire. Barker was a stout believer in the traditions of his profession: and was never known to act in any unprofessional way towards a colleague. He was very human, alike in his faults and his virtues; always optimistic, and in his dealings with his fellows ever ready to believe the best and see the best side of anyone, until or unless experience undeceived him. He was a staunch friend, and in that capacity he will be sorely missed by one who had been admitted to his close friendship to such a degree that we two came to be described as "stable companions."

G. W. C. KAYE, D.Sc., F.R.S.

The death of Dr. George William Clarkson Kaye, F.R.S., on April 16 at the age of 61 removes a distinguished physicist who had many and important contacts with medical science, and through it with medical practice. Dr. Kaye had been superintendent of the physics department of the National Physical Laboratory, Teddington, for nearly twenty years. Among the many high offices held by him were those of president of the Roentgen Society and of the British Institute of Radiology, secretary of the International X-ray and Radium Protection Committee, member of the National Radium Commission and its secretary for four years, member of the Grand Council of the British Empire Cancer Campaign, chairman of the Noise Investigation Committee appointed by the Minister of Transport, and honorary editor of the *British Journal of Radiology* for thirteen years. He had also been Mackenzie Davidson lecturer and medallist and Stanley Melville memorial lecturer and medallist, and thus commemorated two pioneers in medical radiology.

ERIC SNELL, M.A., M.B.

The medical profession in Nottingham has sustained a great loss by the death of Dr. Eric Snell, which took place on April 6 after a long illness patiently borne.

James Eric Boobbyer Snell, who was 63 years of age, came of a medical family of the East Midlands. He was himself the son of a doctor, Dr. Enoch Snell, and two of his brothers are members of the medical profession—Dr. Montague Snell of Nottingham, and Dr. Rupert Snell of Wimbledon. One of his two sons, Surgeon Lieut. Thomas Brooking Snell, R.N.V.R., has kept up the medical tradition of the family; his other son is a flying officer in the R.A.F.

The late Dr. Snell was associated with Nottingham during the whole of his life. He was educated at the High School there, afterwards going on to Caius College, Cambridge. In 1898 he took the Natural Sciences Tripos with honours, and continued his medical education in London at St. Thomas's Hospital. He qualified in 1902 and settled down in practice in his own Nottingham, where he quickly gained wide esteem as a family practitioner among both his patients and his medical colleagues. The large and representative assembly which filled the church at Edwalton, the village where he had lived in recent years, on the occasion of his funeral was a testimony to the regard in which he was held.

Dr. Snell had been a member of the British Medical Association for thirty-seven years. When the Association held its Annual Meeting in Nottingham in 1926 he was co-editor with Dr. Galloway of the admirable *Book of Nottingham* prepared for the occasion. He was an active member of the Nottingham Medico-Chirurgical Society, and was identified in various ways with University College and with the branch of the British Red Cross Society. His three daughters are serving in a Red Cross hospital. His illness began in a severe form in the autumn of 1939. He knew that it could have only one end, but his attitude was one of such oustanding courage as to cheer and inspire all who came in contact with him in recent months. He married the daughter of the late Sir Thomas Shipstone, a well-known Nottingham philanthropist closely associated with the Nottingham General Hospital, who survives him.

RUBY BLACKLOCK THOMSON, M.B., Ch.B., D.P.H.

Dr. Ruby Thomson was born in May, 1889, at Hong Kong, the elder daughter of Dr. J. C. Thomson, a member of the Government Medical Service of that Colony. She came to England at the age of ten, and in 1912 graduated in medicine at Edinburgh University, and in 1923 took the D.P.H. (Ed. and Glasg.). She held appointments at Toxteth Infirmary, Liverpool, at Victoria Hospital for Sick Children, Hull, and under the County Council of Staffordshire, and during the last war was resident medical officer at Woolwich Arsenal. In 1919 she served for some months under Dr. George Buchan at Willesden, and in July of that year was appointed medical officer in charge of maternity and child welfare to the Metropolitan Borough of Fulham. This post she held till last June, when she retired on account of ill-health. She had been a member of the B.M.A. for twenty-eight years.

Dr. Thomson writes A. H. N.) was known to suffer from high blood pressure. During the evening of April 2, while chatting with friends, she suddenly complained of giddiness, slid from her chair unconscious, and by shortly after midnight had slipped out

of life, leaving an appreciable gap in the senior ranks of the Public Health Service and a wider one in the hearts of her many friends. On the intellectual side Dr. Thomson inherited an excellent brain of the accurate order and always had a complete grasp of the administrative and clinical details of her work. She did not "think," she knew, and one could go to her, as indeed many did, in the confidence that information would be most willingly given and would be correct. The same applied to matters of general knowledge, in which her interests were wide. In the Borough of Fulham she set and maintained a high standard of work and had the full respect and confidence of councillors, officials, and public. At medical meetings she did not often speak, but when she did it was to the point. It was, however, in her personal relationships that Dr. Thomson made her greatest impression. She had character and personality in an unusual degree. With the highest code of personal and professional conduct that never condoned slackness or inefficiency in herself or in others, a shrewd and realistic judgment of persons and motives, and a directness of speech which in others might have given offence, she combined much social tact and a generous, enthusiastic, and lovable nature that won friends and willing service wherever she went and among all sorts of people, not least among the poor mothers of Fulham.

It was with a great sense of shock and grief (writes J. A. S.) that the many friends of Dr. Ruby Thomson heard of her sudden death. Dr. Thomson worked in Fulham from the earliest days of maternity and child welfare activity in the borough, and took her full share in the inauguration of the Council's first maternity home, infant welfare clinics, day nursery, and babies' hospital. Her single-minded devotion to her work and her untiring efforts for the welfare of the mothers and babies in Fulham will long be remembered both by her colleagues and her patients, for whom she had a high sense of responsibility and whose personal troubles she so often shared. Dr. Thomson was for many years the Council's representative on the National Baby Week Council and the Association of Maternity and Child Welfare Centres. Her activities in these spheres brought her a wide circle of friends and acquaintances. Her loss will be widely felt, for her honesty of purpose and enthusiastic interest in every phase of maternity and child welfare work endeared her to all.

Universities and Colleges

UNIVERSITY OF GLASGOW

A graduation ceremony was held on April 19, when the following medical degrees were conferred:

M.D.—*Margaret D. Crawford, *A. C. Lendrum, †R. S. Barclay, ‡D. C. Dewar, ‡A. Hutchison, ‡J. S. McGregor, ‡J. McIntosh, ‡ §I. M. Scott, §J. C. Hogarth, §J. E. McClemont, D. A. McCracken, §J. L. Rennie, §A. M. Spence.

M.B., CH.B.—‡R. L. T. Hill, J. Alexander, A. Bancewicz, W. G. Barrie, P. Barron, A. S. Biggart, J. D. Blair, Agnes M. Brogan, J. T. S. Brown, May M. Brown, R. J. Cairns, W. Chambers, Christina C. Christie, W. McC. Crawford, D. C. Devine, W. D. W. Dick, A. B. Donald, J. McD. Glennie, A. Gordon, W. McL. Gregor, H. R. C. Hay, A. L. Henderson, H. D. Hewitt, Catherine T. Howat, A. S. Hunter, Frances M. J. Hutchinson, A. Jamieson, Mary C. Kilpatrick, Dorothy A. Knox, J. D. Laurie, M. B. Leitch, J. Lockie, T. McCarroll, I. R. McCaul, R. O. O. McCrone, H. M. Macfie, J. Mackechnie, S. Y. MacKechnie, A. MacLachlan, L. G. MacLachlan, A. McLaren, Christina R. C. MacLean, N. McLean, Pearl A. I. MacLeod, I. F. MacMath, A. H. Miller, A. G. B. Miller, D. G. Munro, A. A. Murray, A. F. Nelson, J. A. Ogilvy, W. Rankin, F. C. Rodger, T. Sergeant, M. Shafar, A. H. Smith, S. Soldberg, W. Steele, J. S. Stevenson, W. J. B. Templeton, Eleanor Tennant, Janet Waugh, J. B. de V. Weir, G. D. Wilson, D. Wright.

The following prizes, among others, were awarded:

University Prizes.—Bellahouston Medals: Theodore Crawford, A. S. Rogen, A. T. M. Wilson. Captain H. S. Ranken, V.C., Memorial Prize: D. Jamieson.

Special Class Prize.—Surgery, Macleod Medal: R. A. P. Brown.

* With honours. † With high commendation.
‡ With commendation. § *In absentia.*

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a quarterly meeting of the Council of the Royal College of Surgeons of England, held on April 17, with the President, Sir Hugh Lett, in the chair, the Walker Prize for Cancer Research was awarded to Dr. Peyton Rous of the Rockefeller Institute, New York, for his discovery and systematic investigation of filterable tumours.

It was decided to use the bequest from the late Sir Charles Tomes as an endowment for a lectureship on some subject connected with odontology.

Mr. H. S. Souttar was re-elected a member of the Court of Examiners for the ensuing year.

Mrs. Antoinette Pirie, Ph.D., was appointed a Leverhulme Scholar to work in the laboratories of the Imperial Cancer Research Fund on "The Effect of the Spreading Factor on the Reaction between Tumour Viruses and the Cells which they Infect and in which they Multiply."

The Cartwright Prize for 1936-40 was not awarded. The subject for essays for the years 1941-5 is "The Replacement of Lost Tissues following Injuries of the Jaws."

Mr. J. W. Walker and Mr. T. H. Butler, being members of the College of over twenty years' standing, were elected Fellows of the College.

A letter was received from the Imperial Cancer Research Fund expressing appreciation of the award by the College of two lectureships annually to members of the scientific staff of the Fund.

It was decided that in the forthcoming Primary and Final Examinations for the Fellowship the papers may be written alternatively in Manchester or London and the viva voce will be in London only. There will be no Final Examination for the Fellowship in February, 1942.

Diplomas

Diplomas of Membership were granted to G. C. Purslow and J. R. J. Winter.

Diplomas in Child Health were granted, jointly with the Royal College of Physicians of London, to the following candidates:

C. L. Davidson, Mary G. Tate, Brenda M. Jones, H. W. Bradford, Beryl E. Barsby, J. J. Linehan, G. P. McLaughlan, Margaret E. M. McLaughlin, F. C. Oliphant.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examinations, have been admitted L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P. and S.Glasg.:

A. Abrahams, Marguerite S. Annett, J. Bhageerutty, J. W. Bringan, L. G. Christopher, H. O. Engel, A. W. Paterson, E. C. Richardson, H. Sandler, B. Schaefer, J. M. Sherriff, A. Shields, R. J. G. Sinclair, W. J. Y. Speedy, W. F. Vancrosson, J. H. Wakely, W. Waterston, O. M. Watt, G. A. Y. West, J. P. Weiss, V. G. Whelan, J. M. Yablonowitz.

The following graduates of recognized foreign universities were also admitted Licentiates:

S. Frank, Margarete J. Hildebrand, T. Horowitz, Liselotte Lennhoff, Kate Maunsell, O. Olbrich, E. R. Schuster.

Medical News

The Harveian Lecture for 1941 on "The Coroner, the Doctor, and the Public" will be delivered by Dr. John Taylor, at 26, Portland Place, W., on Monday, May 5, at 2.30 p.m.

The Dr. Mann Lectures for 1940-1 on "Chemotherapy" will be delivered before the Royal Society of Arts (John Adam Street, Adelphi, W.C.) by Dr. G. Stafford Whitby, director of the Chemical Research Laboratory, Teddington, on Mondays, April 28 and May 5, at 2.30 p.m.

The special afternoon lectures to be given this spring at the Royal Institution, 21, Albemarle Street, W.1, include one on Tuesday, May 20, by Sir Joseph Barcroft, F.R.S., on the "Development of Function in the Mammalian Organism," and another, on May 27, by Dr. C. F. A. Pantin, F.R.S., on "The Origin of Life"; both at 5.15 p.m.

Major-General Sir John Kennedy, vice-chairman of the Executive Committee of the British Red Cross and St. John War Organization, will read a paper on "The Red Cross in War" before the Royal Society of Arts (John Adam Street, Adelphi, W.C.) on Wednesday, May 7, at 2.30 p.m.

A general meeting of the Medical Society for the Study of Venereal Diseases will be held at 11, Chandos Street, W., on Tuesday, April 29, at 2.30 p.m., when there will be a discussion on "How to Get the Infected Woman under Treatment," to be opened by Dr. Morna Rawlins.

Important discussions in London on questions relating to prisoners of war, including that of getting food to them, have taken place between the British Red Cross and St John War Organization and two delegates of the International Red Cross now on their way back to Geneva. Mlle. Lucie Odier, member of the International Committee of the Red Cross, and Dr. Marcel Junod, the chief delegate, who has seen British prisoners of war and interned civilians in Germany and Occupied France, have established an even closer contact with all Red Cross and St. John Departments and have cleared up a number of matters regarding prisoners of war and internees in enemy hands.

We have received the first number of a new American medical periodical entitled the *Journal of Clinical Endocrinology*, which is to be issued monthly at an annual subscription rate of $6.50. It is published under the auspices of the Association for the Study of Internal Secretions, and is intended to be complementary to the association's older journal, *Endocrinology*, which was first published in 1937.

Dr. Mazyck P. Ravenel, editor-in-chief of the *American Journal of Public Health*, has been made editor emeritus, and is succeeded by Dr. Harry Stoll Mustard, director of the De Lamar Institute of Public Health of Columbia University, New York.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

During the week under review the incidence of whooping-cough has increased and that of measles decreased. The number of notifications for the other common infectious diseases has not been materially altered. Cerebrospinal fever continues to decline: the provisional figures for the two weeks ending April 5 and 12 are 335 and 282 respectively.

Whooping-cough

The further rise in the number of cases reported during the week has been due mainly to the increase in the notifications from London and the Home Counties. Of the three counties which showed the largest increase last week, Lancaster and Leicestershire recorded a fall of 39 and 12 cases respectively, whilst Yorkshire, West Riding, had a further increase, 20 more than in the previous week. The principal increases in this county were from Huddersfield C.B. 20, and Batley M.B. 18.

Measles

Although the incidence of measles decreased for the country as a whole, London and the surrounding counties had an increased number of cases on the previous week. The increases were Bedfordshire 5, Berkshire 35, Hertfordshire 63, Kent 47, London 21, Middlesex 214. The large rise in Middlesex was due to the increased incidence in Edmonton M.B., where the cases rose from 109 to 215, and Enfield U.D. with a rise from 59 to 189.

Dysentery

The total number of cases showed an increase of 12 on the total for the previous week. The most notable of the localized outbreaks are Kent, Dartford R.D. 9; Leicestershire, Leicester C.B. 19; Glamorganshire, Cardiff R.D. 21. No cases were reported from these areas in the preceding week.

Paratyphoid Fever

Ninety-one cases of paratyphoid have been reported from Scotland during the week under review, making a total of 173 for the last two weeks. The counties of Angus 13, Inverness 48, Moray and Nairn 15, and Ross and Cromarty 87, account for practically all the cases during these two weeks.

Scabies

From several areas in England and Scotland reports have shown an increase in the incidence of scabies: the spread of this disease has caused concern to local authorities. Cases of scabies have been increasing during recent years and have proved intractable. The fact that it is not notifiable and that local health departments have no statutory powers for dealing with it makes the condition extremely difficult to control.

No. 13

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 29, 1941.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941					1940 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)*	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	319	22	72	4		475	52	106	2	9
Deaths		3	2				6	11		
Diphtheria	1,033	42	257	32		678	31	245	50	32
Deaths	30	1	8	3	2	20	1	5	—	3
Dysentery	140	23	27			28	2	63		—
Deaths			—	—				—	—	—
Encephalitis lethargica, acute	5	—	—			4	—	1		—
Deaths		1	—				—	1		
Enteric (typhoid and paratyphoid) fever	20	6	93	5		29	3	189	2	—
Deaths	1	—	—	—		2	1	1	—	—
Erysipelas			35	3				52	3	1
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years	30	4	12	6	7	35	2	11	12	7
Deaths										
Measles	14,589	270	142			4,111	51	58		190
Deaths	20	1	—	—		7	—	1	1	3
Ophthalmia neonatorum	79	2	20		*	83	6	25		2
Deaths										
Pneumonia, influenzal†	1,264	53	28	10		1,296	63	26	11	9
Deaths (from influenza)	87	9	8	1	8	221	16	15	7	11
Pneumonia, primary ..			533	21				255	7	
Deaths		—		13	24		69		21	25
Polio-encephalitis, acute	2	—				1	—			
Deaths		—					—			
Poliomyelitis, acute ..	3	—	1	1		4	—	2		—
Deaths		—	—				—	—		
Puerperal fever ..	—	3	29	5		1	1	13	2	—
Deaths		—					—			
Puerperal pyrexia ..	154	9	37			169	7	24		—
Deaths										
Relapsing fever ..	—	—				—	—			—
Deaths										
Scarlet fever	1,212	53	145	39		770	29	129	33	55
Deaths	—	—	1	—	1	2	—	1	—	—
Small-pox	—	—	—	—		—	—	—	—	—
Deaths		—	—				—	—	—	—
Typhus fever	—	—	—	1		—	—	—	—	—
Deaths			—	—				—	—	—
Whooping-cough ..	4,440	84	855			449	14	17		32
Deaths	39	2	18	4	1	7	—	2	—	1
Deaths (0-1 year) ..	418	41	129	36	24	452	55	75	43	45
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	6,360	965	793	236	203	6,153	929	809	214	194
Annual death rate (per 1,000 persons living)			17.4	15.7	18.2			15.1	14.3	17.0
Live births	5,165	423	847	340	246	5,526	490	780	271	201
Annual rate per 1,000 persons living ..			17.1	22.6	21.5			15.5	18.1	17.7
Stillbirths	247	15	46	—		252	29	35		
Rate per 1,000 total births (including stillborn)			52					43		

* *No returns received from Northern Ireland for this week.*

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

E.M.S. PAYMENT FOR SECOND OPINION OR SPECIAL INVESTIGATION IN SERVICE CASES

The Ministry of Health asks that Circular 2326, which is printed below, be substituted for that bearing the same number which was issued on April 2 and summarized in these columns on April 12 (p. 44).

"I am directed by the Minister of Health to refer to paragraph 3 (e) of Circular 2176, in which it is stated that where, in respect of Service casualties or sick referred to out-patient departments for the purpose, a second opinion or special investigation (or both), including, if required, a report in writing, is necessary, a payment of £1 1s. may be made by the hospital to the practitioner conducting the examination. It appears from inquiries which the Minister has received that there is doubt as to the type of case in which a guinea payment should be made. Subject to any revision of the terms of the circular that may be announced, the following conditions must be satisfied in order to bring a case within paragraph 3 (e):

1. A request for a second opinion clearly implies that a first opinion on the patient's medical condition (and not merely a statement of his symptoms) must be furnished by the medical officer of his unit or of the hospital referring him. Normally this should be in writing and accompanied by a written statement of the matters on which a second opinion or investigation is required.

2. Normally the patient must have been seen by a physician or surgeon at the hospital to which he is referred. Where, however, it is the custom of the hospital to allow patients to be referred at the request of an outside medical officer direct to a special department, the report and opinion from that department may be regarded as a 'second opinion,' subject to the condition set out in the preceding paragraph.

3. A second opinion, which would normally be in writing, reporting on the patient's condition (or reporting the results of the investigation) must have been returned to the referring medical officer.

4. In no case is more than one guinea payable in respect of a particular patient, even if it is necessary for him to see several members of the hospital staff or to attend on a number of occasions for the purpose of the required second opinion or special investigation.

When hospitals claim reimbursement of guinea payments on Form A.G.136 they will be required to certify that the four conditions set out above applied in every case. Where no such certificate can be given, as, for example, in the case of patients who are merely referred, with a statement of their symptoms, for such treatment as the hospital staff think proper, guinea payments cannot be reimbursed by the Department."

Medical Services of H.M. Forces Appointments

ROYAL NAVY

Surgeon Lieut. B. R. Alderson to be Surgeon Lieutenant-Commander.

Surgeon Lieut. E. James (Emergency) to be Surgeon Lieutenant-Commander (Emergency).

Surgeon Lieut. L. Merrill has been transferred to the Permanent List with original seniority of April 3, 1936.

ROYAL NAVAL VOLUNTEER RESERVE

Probationary Surgeon Lieut. N. M. Hancox to be Surgeon Lieutenant.

To be Temporary Surgeon Lieutenants: M. W. Bird, R. Browning, N. F. E. Burrows, J. A. Bowen-Jones, P. J. Byrne, A. D. Bell, E. R. Bowes, E. A. Bisson, J. Barr, R. A. Andrews, T. T. Baird, H. M. Balfour, J. A. O'Callaghan.

Probationary Temporary Surgeon Lieuts. R. E. D. Wheeler, R. C. S. Benson, M. J. Clow, G. K. Burton, N. A. C. Best, J. C. Ballantyne, F. R. Badenoch, D. R. Barry, T. E. Barwell, P. A. Bennett, J. L. Adlington, R. G. Allen, J. K. Armstrong, J. M. Berry, J. G. Brown, J. I. Cunningham, I. Chadderton, J. B. Longmore, P. C. Collinson, B. D. Stutter, D. M. F. Carter, C. H. Bartlett, P. A. Byrne, W. J. Drummond, M. W. Fletcher, H St C. C. Addis, R. G. Thomas, E. M. B. Clements, D. A. Jennings, G H Swapp, J. C. G. Abraham, F. C. Barlow, T. A. Best, G. N. Arthurs, G. B. Locke, A. J. Barrett, A. Ackroyd, R. G. S. Whitfield, C C. Kirby, W. J. Matheson, G. H. T. Williams, H D. McGorry, A E Sherwell, R. B. Mayfield, I. Miskelly, H. S. Provis, J. H. Garnett, A. H. Zair, R. S. P. Hawkins, M. McC. Weir, D. M. Morrisey, P. C. Lawson, D N Leeming, F. A. Henley, N. J. de V. Mather, C. B. Holland, J. H. Foxton, W. O. Thomas, N. S. Lockyer, D. H. Johnston, G. C. Haywood, W. B Jamieson, J. W. Wood, G. S. Wigley, J. F. Ramsden, C. J. Milligan, J D Manning, T. D. C. Ritchie, C. G. Campbell, R. P. Crick, J. McD. Christie, P R K. Coe, D. Craig, and H. H. Crabb to be Temporary Surgeon Lieutenants.

ARMY

Lieut.-Colonel (temporary Colonel) D. C. Monro, K.H.S., from R.A.M.C., to be Colonel.

Colonel A C. H. Gray, O.B.E., retired pay, late R.A.M.C., has reverted to the rank of Major whilst employed during the present emergency.

ROYAL ARMY MEDICAL CORPS

Major and Brevet Lieut.-Colonel (temporary Lieut.-Colonel) A. E. Richmond, O B E., to be Lieutenant-Colonel.

Lieut.-Colonels A. N. Dickson, M.C., retired, I.M.S., and M. R. C. McWatters, retired, I.M.S., have reverted to the rank of Major whilst employed during the present emergency.

Captains (temporary Majors) F K Bush and E. S. Tweedy to be Majors.

Captain W. L. O'Donnell has relinquished his short-service commission on account of ill-health.

Short Service Commission. Lieut. (on probation) J. E. Miller has been confirmed in his rank.

REGULAR ARMY RESERVE OF OFFICERS

Colonel A. E. S. Irvine, D.S.O., late R.A.M.C., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

ROYAL ARMY MEDICAL CORPS

Lieut.-Colonel I. R. Hudlestone, D.S.O., has ceased to belong to the Reserve of Officers on account of ill-health.

Captain C. W. Simpson has ceased to belong to the Reserve of Officers on account of ill-health.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

War Substantive Captain R. Dormer has relinquished his commission on account of ill-health.

ROYAL AIR FORCE

Air Marshal Sir A. V. J. Richardson, K.B.E., C.B., K.H.S., has been placed on the retired list at his own request.

Postgraduate News

A series of special lectures has been arranged under the auspices of the Honyman Gillespie Trust to be held in the West Medical Theatre, Edinburgh Royal Infirmary, on Thursdays, at 4.30 p.m., from May 8 to June 12, both dates inclusive. The lectures are open to all graduates and senior students, and details will be published in the postgraduate diary column of the *Supplement* week by week.

WEEKLY POSTGRADUATE DIARY

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.—*Daily*, 10 a.m. to 4 p.m., Medical Clinics, Surgical Clinics and Operations, Obstetrical and Gynaecological Clinics and Operations. *Daily*, 1.30 p.m., Post-mortem demonstrations. *Tues.*, 11 a.m., Paediatric Clinic, Dr. R. Lightwood. *Wed.*, 11.30 a.m., Clinico-pathological Conference (Medical). *Thurs.*, 2 p.m., Dermatological Clinic, Dr. R. T. Brain; 2 p.m., Radiological Demonstration, Dr. Duncan White. *Fri.*, 12 noon, Clinico-pathological Conference (Surgical); 2 p.m., Clinico-pathological Conference (Gynaecological); 3 p.m., Sterility Clinic, Mr. V. B. Green-Armytage.

DIARY OF SOCIETIES AND LECTURES

ROYAL SOCIETY OF MEDICINE

Section of Odontology.—Mon., 2.30 p.m. Paper by Mr. Edgar B. Manley: Experimental Investigation into the Early Effects of Various Filling Materials on the Human Pulp. Film by Mrs. Shirley Hughes: Development of Rodent Teeth.

Section of Psychiatry.—Tues., 4.30 p.m. Discussion: The Possibility of predicting Breakdown under Service Conditions. Openers, Surgeon Captain Desmond Curran, R.N.V.R., Wing Commander R. D. Gillespie, R.A.F., Colonel J. R. Rees, A.M.S., and Dr. Eliot Slater.

Sections of Otology and Laryngology.—Fri. Combined annual general meeting. Election of officers and council for 1941-2. 10.30 a.m., Discussion: Chemotherapy, Serotherapy, and Haemotherapy in Otology and Laryngology. Openers, Col. L. E. H. Whitby, Dr. H. F. Brewer, Mr. J. Angell James, and Mr. N. Jory. Short paper by Sir Milsom Rees: The Role of the Labyrinth in Man and Animals. A clinical meeting will be held in the afternoon.

Section of Anaesthetics.—Fri., 2.30 p.m. Annual general meeting. Election of officers and council for 1941-2. Short papers by Dr. K. C. McCarthy (Toledo, U.S.A.), Dr. E. A. G. Goldie, Dr. Francis Evans, and Dr. F. B. Mallinson.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, W.—*Tues.*, 2.30 p.m. General meeting. Discussion: How to get the Infected Woman under Treatment. To be opened by Dr. Morna Rawlins.

ROYAL SOCIETY OF ARTS, John Adam Street, Adelphi, W.C.—*Mon.*, 2.30 p.m. Dr. Mann Lecture by Dr. G. Stafford Whitby: Chemotherapy. *Wed.*, 2.30 p.m. Dr. O. R. Tisdall: The General Practitioner and Scientific Thought.

SHAFTESBURY MILITARY HOSPITAL MEDICAL SOCIETY.—*Tues.*, 3 p.m. Prof. J. A. Nixon: The Treatment of Serious Gas Casualties.

Diary of B.M.A. Central Meetings

MAY

1 Thurs. Journal Board, 2.15 p.m.

B.M.A.: Branch and Division Meetings to be Held

WILTSHIRE BRANCH: SWINDON DIVISION.—At Victoria Hospital, Swindon, Wednesday, April 30, 8.30 p.m. Meeting. Address by Dr. I. G. Davies (Bristol).

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

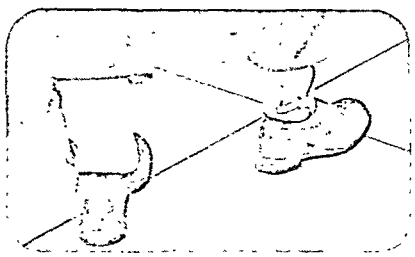
BIRTHS

ACTON.—On April 9, 1941, at Exeter, to Muriel (*née* Gent), wife of Dr. Hugh Acton, of Okehampton, Devon, a son (David John).

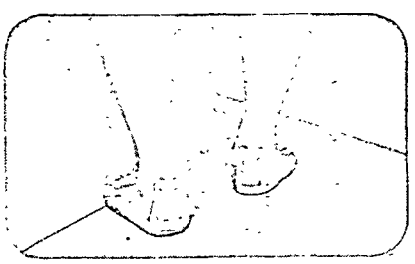
LAMMING.—At the Jane Crookall Maternity Home, Douglas, I.O.M., on April 13, 1941, to Dr. Olive Mary Lamming (*née* Callow) and Captain Robert L. Lamming, F.R.C.S., R.A.M.C., a daughter.

DEATH

WOODMAN.—On April 15, 1941, suddenly, at Jersey, Carmen Sylva Road, Llandudno, (late of Baghdad) Gordon Stewart Woodman, F.R.C.S., beloved husband of Kathleen Woodman.



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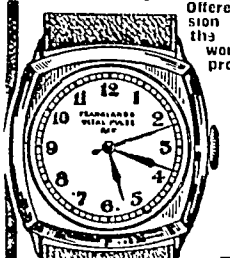
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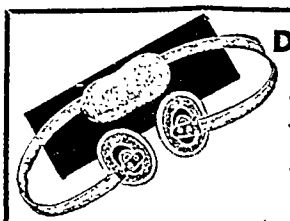
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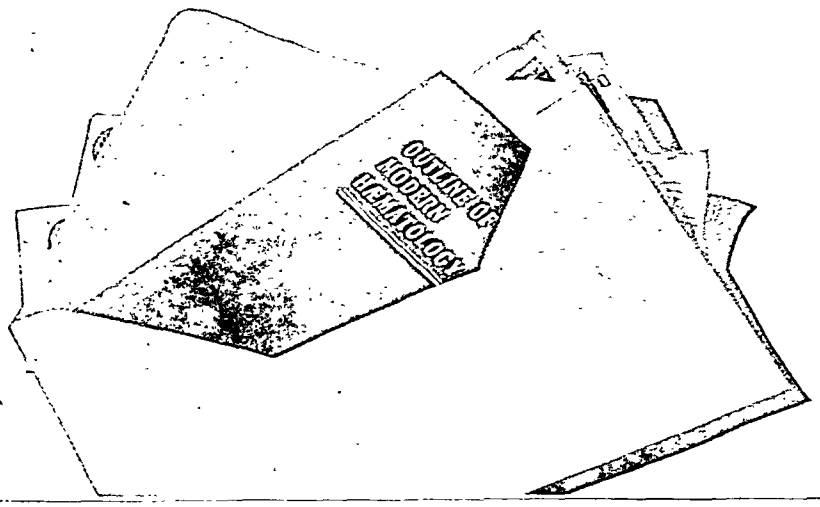
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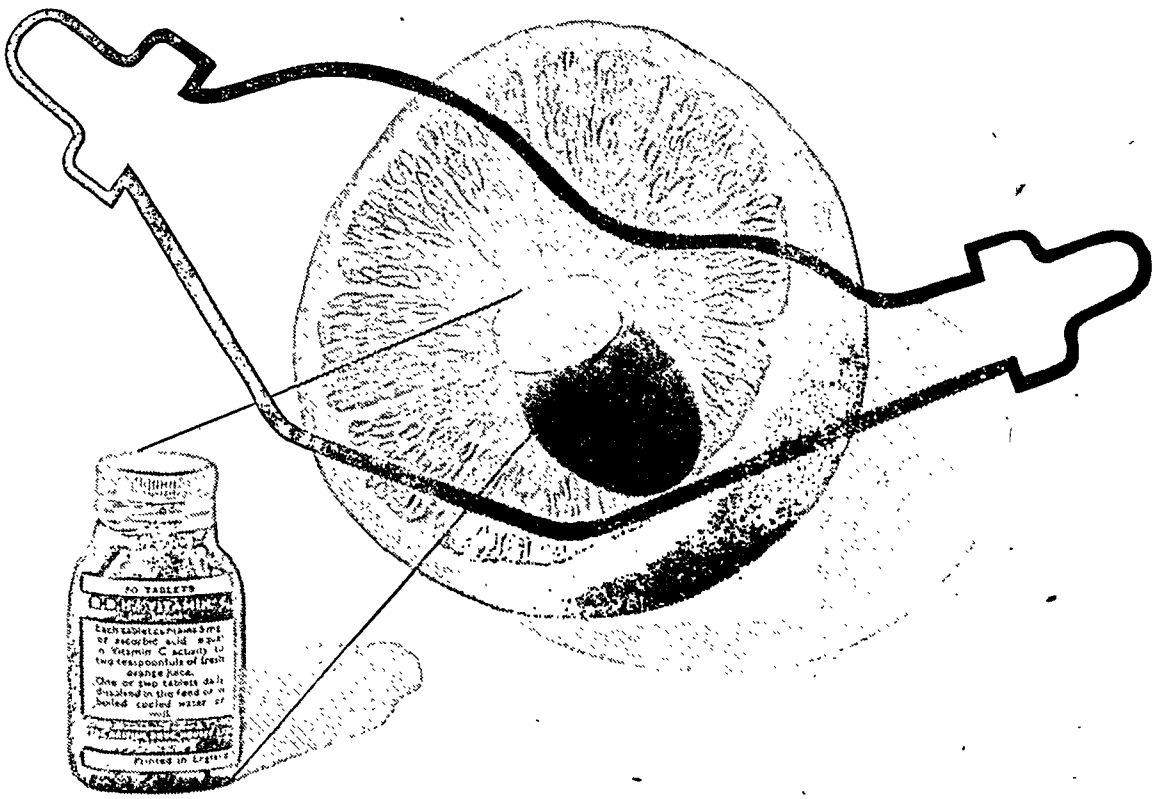
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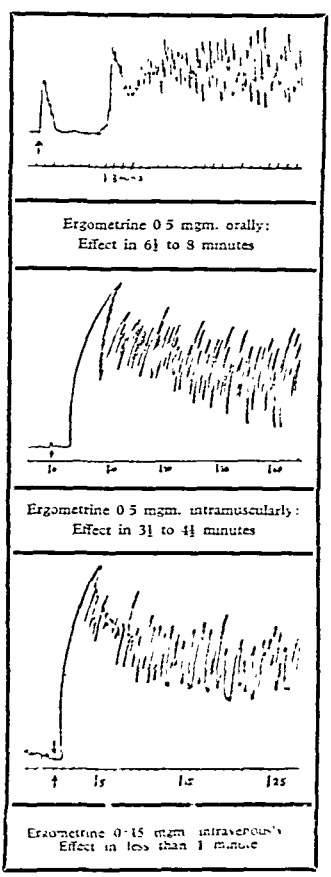
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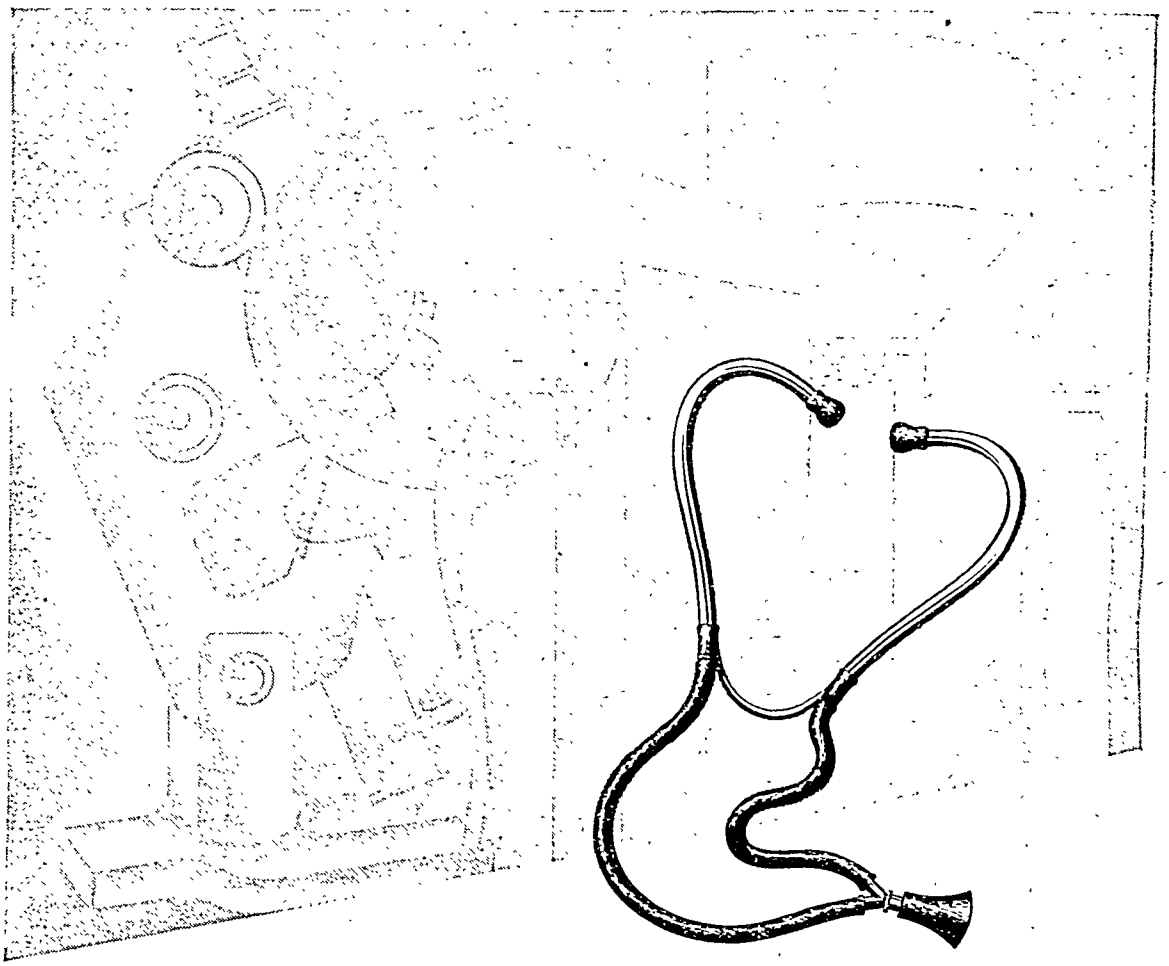
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 3 1941

INJURY AND INTERNAL DISEASE

BY

G. F. WALKER, M.D., M.R.C.P.

When a person alleges that a disease was brought on by injury truth may reside in one or other of the following:

TABLE I

(*a*) Injury may cause disease.
(*b*) Injury may precipitate disease.
(*c*) Injury may aggravate disease.
(*d*) Disease may promote injury (Ewing's "traumatic determinism").
(*e*) Injury may reveal disease.
(*f*) The association may be a pure coincidence.
(*g*) In post-traumatic debility and invalidism sundry maladies and degenerations may be installed.

In an assessment of any case certain minimal data must be forthcoming—namely:

TABLE II

(*a*) An authentic and tested statement of particulars of the injury.
(*b*) A full record of clinical chronology covering the pre-accident period, the injury, and the post-traumatic period.
(*c*) Accurate observation of all clinical phenomena, identification of the disease beyond all doubt, and a knowledge of the morbid processes at work.

With this framework we can first turn to the literature, and at once a few generalizations stand out:

TABLE III

(*a*) There is hardly any internal disease which has not by someone somewhere been attributed to injury.
(*b*) A very great deal of plagiarism and uncritical acceptance of authority has taken place.
(*c*) There is often a hopeless conflict of opinion between pathologists and clinicians.
(*d*) Many flimsy pieces of evidence have been copied from book to book for years.

Cancer

The first internal malady worthy of study is cancer, and here we are faced with conflicts of opinion. Briefly, three views can be found in the literature on the subject of injury causing cancer—namely: (1) Such an event is opposed to all known principles, but it may occasionally happen. (2) It not only may occasionally happen but in certain types of cancer it frequently does happen. (3) Wherever truth may lie between propositions 1 and 2, here, at least, is an authentic and well-tested case, or series of cases, without comment.

The main leaders of proposition 1 have been Phelps (1910), who, however, excluded sarcoma from his survey; Stephens (1928); Knox (1929), whose paper was an incisive and hostile counterblast to the writings of Coley; Mock and Ellis (1926); and more especially Ewing (1926, 1928).

As is well known, the chief exponent of proposition 2—namely, that injury is often associated causally with cancer—has always been Coley, who began his observations more than forty years ago. When Knox suggested that the protocols of Coley and others were nothing but a parcel of anecdotes and vague impressions Coley (1929) replied with the obvious retort that many authors make too great an effort to discredit the direct statements of intelligent patients. It is a fact that Coley's cases are always minutely described, and one often has a feeling that scepticism about his conclusions would be the very antithesis of science.

Class 3—namely, cases of post-traumatic cancer described by clinicians without comment—cause little difficulty. They are very scarce in medical literature as a whole. Among the best examples are those of Levy (1927) (sarcoma), Wainwright (1928) (carcinoma), Paul (1929) (rodent ulcer), Wells and Cannon (1930) (carcinoma of lung), Haler (1931) (sarcoma), Haler (1932) (sarcoma), Shaw (1935) (sarcoma), Willan (1930–1) (sarcoma).

The whole literature on cerebral tumour allegedly following injury was carefully reviewed by Marburg in 1934. The only possible conclusion from this typical pre-anschluss Viennese monograph is that head injury is extremely rare and unimportant as a cause of cerebral tumour. Parker and Kernohan (1931) found in a series of 431 cases of glioma of the brain that 58 (13.4%) reported injury as a cause. In a series of 431 patients without tumours of the brain there was a history of injury to the head in 45 (10.4%). In 200 normal persons 71 (35.5%) reported injury to the head. On further examining the 58 the history could be disregarded in all but 21—i.e., 5%.

Lastly, in the matter of comparative pathology it is very notable that Volume XCIII, 1931, of *Annals of Surgery*, which was devoted to an international study of cancer, contained little or nothing about acute traumatic malignancy. Slye (1931) recorded observation on seemingly very quarrelsome mice. Of 14,000 necropsies on these animals, 1,301 showed indisputable neoplastic growths. Of the 1,301, 51 arose under observation at the sites of recorded gross trauma sustained in fighting. Slye thought little of this, but believed more in heredity and gave good reasons.

Organic Nervous Disease

We can now pass to a consideration of organic nervous disease, exclusive of epilepsy and mental disorder, which will be dealt with later.

Here again three types of views are discernible in the very extensive literature—namely: (*a*) Trauma plays no part at all in the installation of organic nervous disease. (*b*) In certain cases trauma is the decisive precipitating factor. (*c*) Wherever truth may lie between *a* and *b*, here is a thought-provoking case.

The great authority of Kinnier Wilson (1923) stands behind proposition *a*. Addressing the American Medical Association at San Francisco in 1923, he expressed himself as hostile to the notion that trauma might initiate morbid neurological processes, especially progressive lesions. He denounced suggestions of the existence of traumatic cerebral tumour, but grudgingly admitted that a few cases of disseminated sclerosis and a very few cases of tabes and dementia paralytica might seem to be initiated by trauma. Very similar views have been expressed by Crouzon (1931), Jelliffe (1935), and many others of less standing.

There is a very rich seam of literature in support of proposition *b*—namely, that trauma may in certain cases initiate organic nervous disease. Harris (1933) quotes what he calls the "astounding difference" in the views given on the traumatic factor in progressive muscular atrophy in the second and the fourth editions of Price's *Textbook of Medicine*, and points out the fallacies of condemning the possibilities of trauma. He quotes his own cases in great detail, and these support proposition *b*. Harris sums up his personal experience as follows: "My own view is that when symptoms develop directly after an injury in a previously healthy individual we have no right whatever to assume that the injury has no causal connexion with the development of the disease." Very similar views were expressed by Hinds-Howell (1932) and Garland (1938).

Coming to proposition *c*—namely, simply recorded cases—we find the following: Jelliffe (1935) reported one case (not seen by him) of alleged traumatic amyotrophic lateral sclerosis together with some learned comments on contradictions and evasions by neurologists. The bulk of his paper is a summary recapitulation of 90 similar cases from the literature with comment such as "doubtful" or "too remote," but no substantial discussion. In another further study of alleged traumatic amyotrophic lateral sclerosis Waggoner and Löwenberg (1939) published a remarkable case of a patient exhibiting *both* amyotrophic lateral sclerosis due to natural causes and a traumatic syndrome resembling amyotrophic lateral sclerosis. Elkington (1936) examined and reported on 41 cases of meningitis serosa circumscripta. He believed trauma to be the cause in 9. As for progressive muscular atrophy, Sutton (1938) recorded one case on rather attenuated evidence, and Walker (1938) mentioned four cases, in only one of which the traumatic cause was accepted without question by the party liable to pay compensation. Turner (1939) made a very careful survey and concluded that trauma might initiate progressive muscular atrophy in a certain small proportion of cases.

There are on record any number of cases of Parkinsonism allegedly due to trauma, and among the best examples are: Pommé and Liégeois (1931), following head injury; Ramond (1935), following concussion; Weinberg (1939), 2 cases following electric shock; Patrick and Levy (1922), general review; Grimberg (1934), head injury; Kulkov (1932), head injury; Bruetsch and De Armond (1935), head injury; Faure-Beaulieu (1932), peripheral injury; Naville and de Morsier (1932), review of 42 cases following peripheral injury; Hodgson (1937), peripheral gunshot wound; Walker (1937), peripheral industrial accident.

There is one other disease which I have always thought nervous rather than "rheumatic." I mean chorea. In 1934 I found myself in possession of minute notes of 200 cases of chorea, personally observed. In these 200 I found 26 definitely initiated by physical injury such as a scald, lacerated scalp, injuries in a fire, severe caning, dog-bite, etc. (Walker, 1935).

Myocardial and Pericardial Lesions

A very learned monograph on myocardial and pericardial lesions alleged to follow non-penetrating trauma was written by Warburg of Copenhagen in 1938. It is very interesting to peruse the reviews of this little book. In England the *Lancet* (October 22, 1938) was friendly, noncommittal, and uninformative, while the *British Medical Journal* (November 12, 1938) was hostile, critical, and sceptical about Warburg's conclusions. On the other hand, the *Journal of the American Medical Association* (November 12, 1938) willingly accepted Warburg's conclusions that blunt non-penetrating trauma to the chest may indeed install myocardial disease. The subject has been reviewed in modern fashion by Barber (1940), whose notes and references set out a clear exposition. Case records especially worthy of study (in addition to those quoted by Barber) are those of Kahn and Kahn (1929); Kahn (1930); Levison (1927); and Elkin (1935). The case which is reported by Priest (1939) is an especially interesting and curious one. The paper by Hay and Jones (1927) purporting to show the installation of auricular fibrillation by trauma met with severe criticism in that many cardiologists in effect insisted that the cases did not fulfil the requirements laid down at the beginning of this paper (Table II).

The best recent review of coronary disease and angina following strain or inordinate exertion is that of Boas (1939), who showed the relationship clearly in an admirably careful survey of 14 cases.

Mental After-effects of Head Injury

A consideration of the mental after-effects include a review of the literature on traumatic epilepsy, late traumatic apoplexy, psychosis, and chronic subdural haemorrhage. These are here considered in turn:

Of traumatic epilepsy Stevenson (1931) wrote:

> "The term 'traumatic epilepsy' should be limited to cases of epilepsy resulting from injury to the brain or its membranes. The term 'Jacksonian epilepsy' should be applied only to localized fits of cortical origin. . . . Traumatic epilepsy may develop as late as ten years or more after severe injury of the head, but usually there has been in the interval vertigo, paroxysmal headache, or other premonitory symptoms. Epilepsy following superficial wounds of the head is most often psychogenetic in origin. . . . The fits in traumatic epilepsy are, in most cases, clinically the same as in idiopathic epilepsy. Both major and minor attacks occur. Vertigo and mental deterioration are both more common in traumatic epilepsy than in idiopathic."

Similar observations can be found in the writings of Symonds (1935), Turner (1923), Wagstaffe (1928), and Elvidge (1939). Finally, Foerster and Penfield (1930) stressed the part played by progressive intracerebral scar formation.

The very large amount of literature on late traumatic apoplexy has been ably surveyed by Symonds (1940).

The literature on mental disturbance following head injury is truly formidable. Most papers are modelled on that of Mickle (1892), who recognized as possible sequelae

to head injury: (*a*) psychoneurosis, such as automatism, stupor, melancholia; (*b*) paranoia; (*c*) organic disease, with dementia; (*d*) functional disturbance. At the B.M.A. Meeting at Cardiff in 1937 the mental effects of head injury formed a topic of important discussion. Mapother (1937) referred to the lack of unanimity among authorities and the different views held by civil and military experts. He quoted a series of 5,000 private patients, of whom 123, or possibly slightly fewer, owed mental disorder to head injury. Other speakers mentioned the following possibilities:

(*a*) Pre-existing mental instability disposes to gross hysterical manifestation after head injury.

(*b*) Persons of cyclothymic or manic-depressive mental constitution are prone to an attack of depressive psychosis after head injury.

(*c*) Subarachnoid haemorrhage must always be considered in cases of mental disorder following head injury. Similarly, cerebral oedema often plays a part.

(*d*) Much vague mental disorder after head injury could be prevented by clear, decisive, prompt, and positive clinical and legal handling of the patient.

(*e*) Howsoever they arise (and much is obscure) schizoid psychoses are common sequels to head injuries.

Of "chronic subdural haemorrhage" there is little to be said beyond what Trotter (1914) originally stated. He defined the illness as consisting of a relatively mild injury, a latent period, headache, drowsiness, and remarkable transitions between full consciousness and coma. A very good recent summary, well illustrated, is given by Fleming and Jones (1932) with details of 8 cases. Another review of 22 cases is that of Gardner (1935). Other literature of importance is: Pearson (1928), head injury in two boys (sequel in each case was a regression to the symptoms and behaviour of an illness each had had in infancy); Mock (1929), similar to Mapother; Le Fevre (1933), morbid anatomy; Hoch and Davidoff (1939), role of previous personality in the development of traumatic psychosis.

Injury to Bones and Joints

The best recent summaries of disease processes induced by injury in bones and joints were given by Buchman (1929) and Brailsford in 1936. The latter stated that he was familiar with localized rarefying osteitis or "osteochondritis" in 21 different sites, and said: "After carefully weighing the evidence obtained from over 100 cases personally observed, I am of the opinion that trauma is the exciting cause of these conditions, but in view of the fact that it is the minority only of the cases of trauma in which the sequence of characteristic changes develop, I feel that there must be some other contributory factor."

Two post-traumatic osseous maladies call for special mention. The first is osteochondritis dissecans, and it is quite noteworthy that König, who first described this in 1888, and Burr, who followed with a modern description in 1939, both thought that trauma was not solely responsible. However, Fairbank (1933), in a very careful survey, said he believed that osteochondritis dissecans of the knee (the usual site) was caused by trauma "pure and simple," and he explained the mechanism as violent rotation inwards of the tibia, driving the tibial spine against the inner condyle. Monteith (1934) published a remarkable case in close support of this. Funsten and Kinser (1936) reported a substantial series of cases showing the preponderating influence of trauma and the appearance of osteochondritis dissecans in sites other than the knee.

The second malady is post-traumatic osteoporosis, which, if accompanied by pain, swelling, and vasomotor disturbance, is sometimes called Sudeck's atrophy. Good accounts of this have been published by Gurd (1935)—24 cases beautifully illustrated; Leriche and Fontaine (1936a, 1936b)—16 cases, also beautifully illustrated; Middleton and Bruce (1934)—7 cases; Middleton (1937)—full clinical description; Beyer, 1938; and Simpson (1937)—a very obscure and unusual case of painless decalcification.

Diabetes Mellitus

Trauma and diabetes mellitus furnish a very rich and contradictory literature. I recently published a case (Walker, 1940) of diabetes mellitus which I thought was directly and solely due to injury. The whole of the literature, and all ideas hitherto expounded on this problem, were summed up in a very lengthy general survey written by Viggo Thomsen in 1938. The author minutely examined 81 cases hitherto published as "traumatic diabetes" and brought forward a large series of highly controlled observations on the changes in carbohydrate metabolism following accident in normal and glycosuric patients. He concluded a very just and erudite monograph with a denial that trauma could ever cause diabetes mellitus. This view had the honour of laudatory acceptance in an unusually long editorial leading article in the *Journal of the American Medical Association* of April 22, 1939, but there remain clinical problems and recorded cases which Thomsen leaves utterly unsolved. It is noteworthy that all Thomsen's work was done before the part played by the pituitary was fully realized. Pedrazzini (1939) expressed conviction that true diabetes mellitus may be precipitated by any kind of injury, and gave fair evidence.

Tuberculosis

The installation of tuberculosis by trauma may take one of four forms, according to May (1928). He recognized: (*a*) recrudescence of a pre-existing focal tuberculous lesion; (*b*) miliary tuberculosis following trauma at the site of a tuberculous focus; (*c*) tuberculosis arising at the site of an injury without history of previous tuberculous disease; and (*d*) phthisis after a non-thoracic injury. Very much more detailed and attractive propositions have been published by Oliver (1915), who gave four seemingly clear cases of post-traumatic phthisis; Tattersall (1922), who described two very convincing cases; Tattersall (1928), who surveyed 300 cases of phthisis, with an authentic history of provocative injury in 4; Stoichitza (1934), who gave an account of two cases of traumatic phthisis and himself described the evidence as "clear, precise, and irrefutable"; and Mayer (1935).

Other Conditions

Leukaemia.—Trauma as a cause of leukaemia has been described by Lewsen (1930), Weil and Bousser (1936), and more particularly by Olovson (1939), who reviewed all published cases and added two of his own. Olovson was disposed to think that trauma may well precipitate myeloid leukaemia in a person already disposed to it.

Appendicitis.—Trauma as a factor in acute appendicitis has been described by Ludington (1923), Behan (1927), and Bissell (1928). The cases described by the last-named are much more credible than the single case described by Ludington. Very lengthy reviews and commentaries were made by Fowler in 1938 and Grettoe in 1939. The conclusion from these five authors is that "it may occasionally happen." Recent cases of traumatic appendicitis include those of Burgess (1938), Rogers (1938), and Goodyear (1938). A great deal of correspondence followed these cases, and the *Journal of the American Medical Association* (June 4, 1938) gave the view, cautiously, that trauma may indeed provoke appendicitis, usually of a grave and fulminating type.

Gastro-duodenal Ulcer.—No paper of this type would be complete without reference to gastro-duodenal ulcer.

Although textbooks of medicine and surgery often mention trauma vaguely in discussing the cause of these maladies, no sets of authentic cases have recently been recorded. But in this connexion, as also in connexion with perforation, many authentic cases are on record in which the stomach has been ruptured by external violence without gross evidence thereof.

Pneumonia.—The possibility of trauma causing pneumonia is always mentioned in textbooks of medicine. It has been referred to over and over again in successive editions of Osler's *Principles and Practice of Medicine.* According to Brockbank (1926) the possibility was known to Morgagni. It was well known to Allbutt, according to his *System.* Several authors mention Litten's series and Stern's series, but I have not found these in the original. On the other hand, Rufus Cole of the Rockefeller Institute, according to his article in *Nelson's Loose Leaf System,* saw 700 successive cases of pneumonia without any trace of trauma at all.

Syphilis.—Trauma in a syphilitic may determine the site of syphilitic lesions in almost all organs of the body. Cases were given by Klauder (1922) as follows (all in proved syphilitics): gumma at the site of a laceration; gumma at site of repeated trauma; gumma of testicle after trauma; change of a negative Wassermann reaction to positive again as a result of trauma (2 cases); aneurysm developing suddenly after violent physical effort; delayed recovery from lacerations; paresis following head injury (3 cases).

At the beginning of this paper I mentioned that there is hardly any disease which has not at some time or other been attributed to trauma. A few case records deserve mention:

Sundt (1921). Trauma as a predominant agent in many cases of pseudo-coxalgia.

Platt (1922). Dissents from Sundt.

Vance (1923). Traumatic lesions of the intestine caused by non-penetrating blunt force.

Hartley (1923). Similar to Sundt.

Moersch (1926). 2 cases of diffuse cerebral gliosis seemingly caused by concussion.

Buchman (1928). Osteoporosis of the carpal bones. (Clinical descriptions not to be found elsewhere.)

Sargent and Greenfield (1929). Close relationship between cranial trauma and haemangiomatous cysts of the cerebellum.

Bolton (1929). Rupture of the stomach from external non-penetrating violence with no sign of external injury.

Chandler (1931). 11 cases of spondylolisthesis (in a series of 18) in which trauma seemed to initiate the symptoms.

Kendall (1931). Traumatic nephrolithiasis.

Mouat, Wilkie, and Harding (1931). Importance of injury in Kienböck's disease.

Capener (1932). 9 cases of spondylolisthesis (in a series of 34) giving a history of injury.

Royal Society of Medicine (1933). Traumatic Argyll Robertson pupil.

Chandler (1934). Bilateral suprarenal apoplexy due to trauma.

Dodd (1934), Gardiner (1935), Hunter (1935). Ruptured spleen after trivial mishaps.

Cooke (1934). Traumatic rupture of lungs without signs of trauma in the chest wall.

Bramwell (1934). Auricular fibrillation caused by head injury.

Fagge (1934). Fatal ulcerative colitis following head injury.

Edström (1936). Five cases of rheumatic fever beginning at or near an injured joint.

Hill (1936). Traumatic oedema.

Muller (1937). Post-traumatic renal stone (in colliery and street accidents).

Thomson (1938). Sudden post-traumatic senility.

Moritz and Wartman (1938). Four cases of post-traumatic internal hydrocephalus.

Meyerding and Pollock (1938). March fracture. (A very full and useful account of a malady now reappearing.)

Monteith (1938). Myositis ossificans with favourable course.

Bedell (1939). Traumatic retinal angiopathy (not necessarily head injury).

Fallon (1940). Lung injury in an intact thorax.

Findlay and MacCallum (1940). Recurrent traumatic herpes.

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REACTIONS AFTER TRANSFUSION OF STORED BLOOD

BY

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The transfusion of stored blood for many conditions has now become an established practice, and it may therefore be worth while to record some observations made on the incidence of reactions after its use.

Reliable statistics about reaction rates both from stored and from fresh blood transfusions are exceedingly difficult to obtain, mainly because there is little uniformity of opinion as to what constitutes a "reaction." Moreover, the reaction rate will vary with the person who carries out the transfusion, the method employed, the rate of administration, and the condition of the patient. Two disasters which cannot rightly be termed "reactions" but which may develop equally after the use of either fresh or stored blood result from an incomplete understanding of the technique of blood transfusion. They are: (1) pulmonary oedema with cardiac failure, due to overloading of the circulation of a patient whose heart is already embarrassed; and (2) renal failure due to transfusion of blood of an incompatible group. The more usual type of reaction that is apt to occur after a blood transfusion is a febrile reaction. It is unnecessary here to discuss the theories of the causes of such a reaction, although it is generally thought that the introduction of foreign protein into the blood stream plays an important part.

Reactions after Transfusion of Fresh Blood

The febrile reaction may be of variable severity. A simple rise of temperature without shivering or rigor is exceedingly common. Kordenat and Smithies (1925) maintain that nearly all transfusions of fresh blood are associated with some rise of temperature, even though this may be symptomless. Riddell (1939) is in agreement with this statement. Other observers believe that about 50% of fresh blood transfusions are associated with a rise of temperature or a rigor. A mere rise of temperature without constitutional effects is of little significance, but a rigor is more distressing and may even precipitate cardiac failure.

In considering the incidence of transfusion reactions, therefore, it is necessary that the reactions be divided into grades. The following classification is made by Riddell: *Grade I*, associated with a rise of temperature to 100° F., but no other objective features. *Grade II*, associated with a similar or greater rise of temperature and subjectively with feeling cold and shivery, but without having an actual rigor. *Grade III*, associated with a definite rigor. Riddell, giving his figures for his last 100 transfusions with fresh blood, noted rigors (Grade III reaction) in 11%. Fell (1938), analysing 500 cases, found reports of rigors in 4.8%. Edwards and Davie (1940) gave the following statistics of reactions after 100 consecutive transfusions of fresh citrated blood at the Liverpool Royal Infirmary: none, 37%; doubtful, 15%; Grade I, 15%; Grade II, 25%; Grade III, 8%. Grade III reactions are the most striking and easily recognized. Their average incidence in these three careful investigations on the use of fresh blood is 7.9%.

Reactions after Transfusion of Stored Blood

Edwards and Davie report that out of 1,364 bottles of stored blood administered by numerous surgeons in a variety of hospitals 69 (5%) gave rise to a Grade III reaction. These and other results with preserved blood, some of which are quoted by them, are tabulated below:

	No. of Transfusions	Grade III Reactions
Liverpool Royal Infirmary (Edwards and Davie, 1940)	1,364	5.0%
Milton Road Infirmary " "	—	4.0%
Walton Hospital " "	—	12.0%
Lundy, Tuohy, and Adams (1937)	149	4.2%
Cameron and Ferguson (1939)	1,000	2.8%
Elliott, Macfarlane, and Vaughan (1939) ..	50	8.0%
Hamilton-Paterson (1939)	46	6.0%
Biddle and Langley (1939)	150	5.0%
DeGowin and Hardin (1940)	1,453	3.9%
Brewer, Manzels, Oliver, and Vaughan (1940) ..	56	5.4%

The average incidence of Grade III reactions in all these transfusions with stored blood is 5.6%.

In order to determine the reaction rate and other results of the use of stored blood from the North-East London depot a label was attached to every bottle of blood sent out. This label consisted of a detachable reply-paid postcard which the medical officer who gave the transfusion was asked to fill in and return. Investigations suggest that in perhaps half of the transfusions carried out this request was complied with. The first 700 labels returned have been analysed, with the following results:

TABLE I.—*Results of Transfusion of 700 Bottles of Stored Blood. Average Age of Blood, 10.8 Days*

No. of transfusions	389	
Grade I reactions	44 (11.3%)	
" II "	17 (4.4%) } 8.5%	= 19.8 per 100 transfusions
" III "	16 (4.1%) }	
Jaundice	6 cases	= 0.86%
Urticaria	4 cases	= 0.57%

Riddell's classification was slightly modified in that Grade I reactions were those in which any rise of temperature above 99° F. was reported but in which there was

no shivering or rigor. Grade II reactions included shivering attacks and mild chills. Grade III reactions were obvious rigors.

Thus the total incidence of Grade II and Grade III reactions was 8.5%, while marked rigors (Grade III reactions) occurred in only 4.1% of cases. These results compare favourably with those of the transfusion of fresh blood to which reference has already been made.

Because of the unreliability of statistics based on a comparatively small total number, and because of the uncertainty as to the proportion of labels that were returned after transfusions, each group of 100 labels was analysed separately, and it will be seen that the figures in each group are in fairly close agreement with each other (Table II). Each bottle contained 360 c.cm. of blood and 180 c.cm. of anticoagulant fluid (composed of 1.05% sodium citrate and 3% glucose in 0.85% sodium chloride solution). The Medical Research Council depots are now using a modification of this mixture (see M.R.C. War Memorandum No. 1, 1940).

TABLE II

Hundred Bottles:	First	Second	Third	Fourth
No. of transfusions	62	63	57	52
Grade I reactions	14.5%	14.3%	12.3%	7.7%
,, II ,,	1.6% } 6.4%	4.8% } 6.4%	5.3% } 8.8%	3.8% } 11.5%
,, III ,,	4.8%	1.6%	3.5%	7.7%
Total	20.9%	20.7%	21.1%	19.2%
Average age of blood	8.3 days	9.6 days	9 days	10.5 days

Hundred Bottles:	Fifth	Sixth	Seventh
No. of transfusions	52	49	54
Grade I reactions	11.5%	10.1%	7.4%
,, II ,,	5.8% } 5.8%	0 } 4.0%	9.3% } 16.7%
,, III ,,	0	4.0%	7.4%
Total	17.3%	14.1%	24.1%
Average age of blood	13.5 days	11.5 days	13.3 days

These findings bear out the opinion of other investigators such as Biddle and Langley, who state: "We are well satisfied that stored citrated blood produces no more complications than does fresh citrated blood, and the advantages of the former cannot be exaggerated." DeGowin and Hardin (1940) state that, in their experience, "no types of reaction were observed from the transfusion of preserved blood which were not already known to be associated with the use of fresh blood. . . . The incidence of various types of reaction did not increase or decrease with the period of storage of the blood mixtures."

In my own series 58 of the bottles of blood were 21 or more days old, but the average age of the blood causing Grade II reactions was 13.4 days, while the average age of the blood causing Grade III reactions was 12.7 days. Reactions were by no means confined to the older blood. Thus, shortly after receiving one bottle of 3-day-old blood one patient had a rigor for ten minutes with a sense of constriction in the chest and headache. On the other hand, two bottles of 21-day-old blood and one bottle of 28-day-old blood were given to another patient without any reactions developing. The oldest blood used consisted of two bottles that had been stored for 33 days. This was given to a patient with salpingitis and a urinary infection whose haemoglobin was 59%. There was no reaction or discomfort during the transfusion, but one hour afterwards she had a rigor. Her temperature fell to normal within forty-eight hours and remained so. There was no jaundice or other untoward reaction, and her haemoglobin had risen to 71% the day following the transfusion. Eight days after the transfusion she was given another bottle of blood—this time 28 days old. There was no rigor or discomfort on this occasion. Her temperature rose slightly (to 99.4° F.) in the evening, but the next day and thereafter it remained normal.

The 4 cases of urticaria resulted from transfusion of blood stored for 1 day, 3 days, 12 days, and 19 days. The six cases of jaundice, however, seemed to be the result of transfusion of somewhat older blood, since in all but one instance it had been stored for 14 or more days.

Red Cell Destruction

Since even fresh blood contains many aged erythrocytes, rapid destruction of these is to be expected after their transfusion. When stored blood is used the degree of destruction increases with the age of the blood. These facts have been demonstrated by Ashby's (1919) method of estimating cell survival after transfusion. Maizels and Hamilton-Paterson (1940) have found, however, that when the blood had been stored for 7 to 14 days more than 75% of the cells survived in the patients' blood stream after six days, and in some instances transfused cells were found months after transfusion. Mollison and Young (1940) found that when blood over 20 days old was transfused a great deal of destruction took place within a few hours of transfusion, although the time taken for the complete disappearance of the transfused cells was little less than that found for fresh blood.

It thus appears that the rapid initial fall in the number of transfused cells of stored blood is due to the destruction of effete corpuscles and that those that do not quickly succumb are relatively resistant to haemolysis. The early destruction of effete cells results in a transient increase in the bilirubin content of the patient's plasma and the presence of urobilin in the urine. If the amount of red cell destruction is excessive the patient may become jaundiced, but this is of very brief duration, since the excess of bilirubin is rapidly removed from the blood stream.

Using the preservative solution described it is found that most of the degenerative changes in the blood, other than the disintegration of the red cells, occur within the first two weeks of storage. Up to three weeks the amount of *in-vitro* haemolysis is negligible. The subsequent amount of haemolysis in previously undisturbed blood, estimated by the method described by Hudson (1940), was as follows:

TABLE III

Length of Storage	Average Haemolysis	No. of Bloods Examined
3 weeks	1.0%	9
4 ,,	2.9%	12
5 ,,	3.8%	13
6 ,,	8.1%	7

Further haemolysis is likely to occur when the stored blood is transfused into a patient, and this can be shown by pipetting off from a centrifuged specimen all the supernatant plasma and replacing it by isotonic saline or fresh normal serum. If this is gently mixed and allowed to stand or is centrifuged, considerable additional haemolysis is observed, and it is found on measurement to be more than that in the original plasma.

It is therefore important as a routine not to use blood preserved under present conditions for more than three weeks, since the haemolysis both *in vitro* and *in vivo* may result in transient jaundice and possibly be the cause of other reactions. Bushby, Kekwick, Marriott, and Whitby (1940) have proved that the increase in plasma bilirubin of the recipient is due not to free haemoglobin in the transfused specimen but to *in-vivo* haemolysis of transfused cells. Amberson (1937) concluded that haemoglobin is not toxic to vertebrates if it has been properly freed from stroma, and Duesberg (1934) has injected haemoglobin intravenously into man in amounts varying

from 2 to 6 grammes without ill effect. Hamilton Fairley (1940) has successfully injected considerably larger amounts after careful alkalinization of the urine.

It is therefore likely that the febrile reactions after transfusion of very old blood are due to products of red cell disruption and degeneration rather than to the mere presence of free haemoglobin in solution.

Though it is not relevant here to discuss the merits of various preservative solutions it is important to use mixtures that are most likely to prevent the early breakdown of the red cells. That haemolysis is impeded by the presence of glucose is now well known. Table IV shows the average haemolysis in five samples of blood, each preserved with and without glucose, over a period of six weeks.

TABLE IV.—*Comparison of Haemolysis with and without Glucose*

Weeks	With Glucose	Without Glucose
3	0.91%	4.99%
4	1.76%	13.24%
5	3.46%	24.75%
6	8.17%	37.4%

Blood preserved in solutions containing no glucose might therefore be expected to lead to a greater incidence of transfusion reactions owing to the additional *in-vitro* and *in-vivo* haemolysis, and this has been found to be so. Thus in the transfusion of fifty bottles of blood preserved without glucose the results of transfusion were as follows:

TABLE V.—*Fifty Bottles of Blood Preserved without Glucose. Average Age of Blood, 11.1 Days*

No. of transfusions	33	
Grade I reactions	18.2%	
,, II ,,	15.1% } 27.2%	= 45.5 per 100 transfusions
,, III ,,	12.1%	
Jaundice		1 case = 3%
Urticaria		1 case = 3%

The total number of bottles of non-glucose blood used is not large, but the reaction rate is considerably higher than in any group of 100 bottles of blood preserved with glucose.

Stored blood can never be better than fresh blood, but its ready availability is an immense advantage, particularly in an emergency, and this outweighs any slightly smaller rise of haemoglobin percentage in the recipient that may occur. The disadvantage of stored blood has been seen to resolve itself chiefly into the question of haemolysis, but with modifications of the preservative solution the life of the red cells can be further prolonged. Fortunately there is now less need to attempt to preserve emergency supplies of blood for long periods of time, since plasma or serum, capable of independent storage for many months, can be given as an emergency measure in place of whole blood in certain cases, when whole stored blood is not immediately available.

Conclusions

There is no significant difference in the nature or number of reactions which tend to occur after the transfusion of fresh blood and blood stored up to three weeks under standard M.R.C. conditions. Such difference as may occur seems to be in favour of stored blood.

When standard stored blood is used a febrile reaction is to be expected in about 20% of transfusions and an obvious rigor in about 5%.

The incidence of jaundice and febrile reactions tends to increase when blood more haemolysed than this is used. These reactions appear to be caused not so much by the free haemoglobin introduced as by the early disruption of effete red cells after transfusion.

Stored blood, as originally prepared, can safely be used for three weeks and in some cases for longer. Modifications of the preservative solution may further increase the useful life of the blood, though the introduction of preserved plasma and serum now renders this less necessary.

I am grateful to Dr. H. F. Brewer, Director of the North-East London Blood Supply Depot, for facilities in making these observations, and to the Medical Research Council for helpful criticisms of the paper.

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CARRIERS OF TUBERCULOSIS

BY

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The fact that many infectious diseases may be contracted from contact with individuals who are not themselves suffering from any of those diseases at the time of contact is well known. Typhoid fever, scarlet fever, and some other streptococcal infections, cerebrospinal fever, diphtheria, and acute poliomyelitis are examples that come to mind at once, but there may be many other diseases which are spread in this way. The exanthemata and even the common cold, though usually contracted in epidemics from known sources, sometimes appear in a sporadic form which suggests the possibility of contact with a carrier.

Types of Carrier

Clinically there are two types of carrier—the known and the unsuspected. A known carrier has had the disease in question and has never been shown to become bacteriologically negative, although he no longer suffers in any way from the infection; in such a case the organisms appear to be saprophytic only. Carriers of this type are usually kept under observation until eventually the organisms are eradicated by some means or other; in any case they are a known danger and can therefore be controlled to some extent. The unsuspected type of carrier is much more dangerous, for his very existence may not be even suspected until extensive damage has been done. Such persons may have had their infection in an abortive or aberrant form, the true nature of which was not recognized at the time, or, more difficult still, they may never have had the disease in their lives so far as the most careful clinical investigation can discover.

In view of the great amount of work which has been done on the carrier problem it is surprising to note that little attention has apparently been paid to the possibility of the existence of carriers of tuberculosis. Of course it is well known that sufferers from chronic pulmonary tuberculosis may eject tubercle bacilli in the sputum for years, but a point often overlooked is that those who have

ceased to suffer from the complaint—i.e., patients whose disease has been classed as and is in fact "arrested"—may do the same thing, either continuously or at intervals. Such patients may be perfectly fit in the physical sense, and every possible test which can be applied to detect the presence of tuberculous toxaemia or of progressive change in the lungs may be negative. There may be no fever even on great exertion, the weight may be steady and satisfactory, there may be no sputum except when a cold or a mild bronchial infection causes slight expectoration, the sedimentation rate may be normal, and the radiographs may show very little damage or, at any rate, no appreciable change over a period of years. It is likely that many individuals who are quite unaware that there is anything at all wrong with their lungs may be coughing up tubercle bacilli from time to time; it is even possible that this also occurs in the case of some in whom no amount of investigation would reveal any trace of disease. The existence of cases in this latter group would be very difficult to prove, for it would mean the wholesale examination of the sputum, almost on a national scale. The fact that, even to-day, phthisis is being recognized as such for the first time in persons who have had cough and sputum for many months, or even for years, suggests that neither the public nor the medical profession are yet educated to the proper standard in the application of this simple test.

The subject of pulmonary tuberculosis is of particular and pressing interest at the present time, both because of the care which has to be taken in order to exclude cases with early disease from the Forces and because of the risk of spread of the infection which is likely to result from contact in air-raid shelters. Much has been written about mass radiography; this is certainly desirable, and the results already have been of considerable value. But it must be remembered that radiographs demonstrate shadows only, and that the information gained solely refers to anatomical change in the tissues. Infectiousness is an entirely different problem, but it is one which is even more important, for it concerns that part of the population which is still not infected, and not a particular individual. The only test of the infectivity of any person is the examination of the sputum. It is not suggested that mass sputum examinations should replace mass radiography, but it seems necessary to point out that these examinations are of immeasurably greater value if both are considered together, and that a complete observation should therefore always be made when looking for tubercle.

Danger of Apparently Healed Cases

The object of the present paper is to point out that apparently completely healed cases of tuberculosis may still constitute a danger to the public health, and to suggest that the disease may even be spread by contact with people who themselves appear to be perfectly normal. While the second part of this thesis is likely to be difficult to prove, four cases are reported in which the disease showed not the least sign of activity and yet the patients were certainly infectious from time to time.

Case 1.—A widow aged 65 came to the out-patient department of the Royal Chest Hospital in 1929 complaining that she had suffered from cough, a little sputum, and increasing shortness of breath for the past three winters. On examination she appeared to be a typical chronic bronchitic. The past history was most instructive. She had had eleven children, of whom no fewer than six had died in infancy from acute forms of tuberculosis. In addition two grandchildren had died from the same complaint. The sputum was negative for tubercle bacilli, but the radiograph showed several small calcified deposits in both upper lobes. On careful questioning she would not admit to any previous period of illness in her life. It seemed perfectly clear that this woman had suffered from tuberculosis in a subclinical form, and that she had been a menace to her family for a considerable period of time.

Case 2.—A retired business man aged 80 was seen in consultation in 1938. His complaint was that he had become rather wheezy during the last three years and found it difficult to manage a complete round of golf, although he was still capable of playing nine holes without undue fatigue. In his case a diagnosis of active tuberculosis had been made in 1888, and tubercle bacilli had been found in the sputum at intervals since that time, although he had led a normally active life. Tubercle bacilli were still present in 1938. On examination there was evidence of fibrosis in both upper lobes, and this was confirmed by radiograph; there was, however, not the least evidence of active disease, and one had the impression that the condition had been stationary for a long time, although it was not possible to prove this as the previous films were not available for comparison. There was, however, evidence that the patient had been coughing up bacilli for half a century, and his clinical state appeared to indicate that the disease had not been progressive for many years. This case illustrates the type of carrier who has made a clinical recovery from the disease but has never become bacteriologically free.

Case 3.—A nursing sister aged 35 complained of a slight cough. In 1929 her sputum was slightly stained on three occasions. No records are available of the condition at that time, but a right artificial pneumothorax was induced and was kept up for two years, when it had to be abandoned owing to obliterative pleurisy. Since that time she had been nursing in a sanatorium and had apparently been in good health. In January, 1940, there was again slight staining of the sputum following a cold, and re-examination showed the presence of a few tubercle bacilli. There were no abnormal signs in the chest, and the radiograph showed only a little thickening of the pleura overlying the right lower lobe, consistent with the old obliterative pleurisy. So far as could be determined the lung fields themselves were normal and a tomogram did not reveal anything further. Between January and July the sputum was found to contain tubercle bacilli on three occasions, although it was negative on several others. In April, 1940, she was admitted to the Royal National Sanatorium, Bournemouth, where the sputum was found to be positive on two occasions. She was not complaining of any symptom except a slight cough with a minimal amount of sputum; her general condition was excellent; there were no abnormal physical signs, the radiograph showed nothing beyond slight pleural thickening over the right lower zone, and the sedimentation rate was 4 mm. in one hour. After keeping the patient under observation for some weeks it seemed impossible to conclude that she was suffering from active tuberculosis as the term is generally understood, and the view was taken that she was in fact a carrier of the disease.

Case 4.—A single woman aged 25 came to the out-patient department of the Royal Chest Hospital in 1932 "for an overhaul." Her brother had died from pulmonary tuberculosis two months previously. The patient appeared to be in perfect health, and physical examination was entirely negative. A radiograph of the chest showed nothing abnormal, but the sputum was reported to contain tubercle bacilli on two occasions, although many other tests proved negative. This patient was kept under observation for two years, during which time her condition remained unchanged and she appeared to be in perfect health. The sputum tests were carefully carried out and there does not seem to be any reason to consider that they were not genuine.

Discussion

These four cases are recorded in order to stimulate further investigation into the infectivity of tuberculosis among members of what appears to be the normal population. Naturally the cases described have been chiefly those in which there had been some story of contact with the disease to account for tubercle bacilli being looked for. In none of them, at the time of examination, could it be said that the patient was suffering from active tuberculosis, yet three were infectious and the fourth had clearly

infected others in the past. The diagnosis of pulmonary tuberculosis rests upon a correlation of symptoms, signs, radiological appearances, and pathological tests. No single one of these can be regarded as sufficient in itself for an assured diagnosis. It appears certain that, without confirmation from these other sources, the presence of tubercle bacilli in the sputum cannot be regarded as proving the contention that there is active disease. In other words, the expectoration of tubercle bacilli may be consistent with clinical health for a long period of time, and persons so expectorating may well act as carriers of the disease. Although not illustrated in this series of cases, it is quite likely that some of the patients who harbour the bacilli in their respiratory tract in this way are liable to relapse and to sustain further spread of the infection in their lungs.

The fact that these cases are infectious is a matter of great importance from the public health point of view Sometimes they are sent to a sanatorium; but sanatorium treatment is not likely to sterilize the respiratory tract, and actually we do not know of any measures that will render such a patient free from bacilli. Steps can be taken to make them as safe as possible by ensuring that they observe the same precautions as do other patients discharged from sanatorium with a positive sputum, the chief difference being that they can lead a normal life without restrictions.

Summary

This paper is not intended as a record of fresh observations, but rather as a presentation of known facts from a somewhat different angle. The object is to stimulate still further the search for the human sources of tuberculous infection, for it is only by their recognition and eventual elimination that the disease will be finally overcome. While it is well known that actively tuberculous patients are a present source of danger, it would help to emphasize the importance of the problem if those who, while clinically in perfect health, still cough up tubercle bacilli, either continuously or at intervals, were regarded as carriers of the disease from the point of view of the public health. Complete reliance on a negative radiograph may be misleading in some cases, and a more diligent search for tubercle bacilli in sputum would certainly yield valuable results.

Four cases are reported in which not the least sign of active tuberculosis was shown, but in which the patients were infectious from time to time.

The cases are discussed from the point of view of their danger to the public health.

As already announced, the Central Midwives Board for England and Wales has re-elected its chairman, Sir Comyns Berkeley. At the April meeting a letter was received from the Midwives' Institute stating that Miss A. A. I. Pollard felt unable to continue as a member of the Board after twenty years' service and that Miss C. K. Knott had been appointed in her place. The remaining members of the Board have been re-appointed. A resolution was passed by the Board expressing great regret at Miss Pollard's retirement and stating that she had devoted herself ungrudgingly to the service of the C.M.B. and of midwives for the past twenty years; in her the midwives of the country have had a representative who justly earned their affection and gratitude. "In championing the cause of midwives and of maternity and child welfare Miss Pollard has been aided by her wide and intimate knowledge of the midwifery profession and has been guided by her high regard for the dignity and responsibilities of that profession. Her enthusiasm for improvement has been tempered with wisdom and a shrewd appreciation of what was capable of early achievement. In all her dealings with her colleagues on the Board and with members of the profession she has displayed kindliness, sympathy, and a noble honesty of mind and purpose. It is a source of gratification to the Board that Miss Pollard has already seen success crown many of the movements she supported."

PELVIC ABSCESSES: DIAGNOSIS AND TREATMENT

BY

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There are few operations more satisfying to patient and surgeon alike than that of draining a pelvic abscess through the rectum. Collections of pus in the pouch of Douglas in the female and in the recto-vesical pouch in the male occur after any septic abdominal operation, but especially after a perforated appendix; less often they follow a perforated peptic ulcer, salpingitis, or suppurative diverticulitis. In a general surgical practice I meet about four cases a year; three will be caused by suppurative appendicitis with peritonitis, whilst the fourth will follow something less common. A recent instance developed after a partial gastrectomy for a huge gastric ulcer which was resected from the pancreas. An undetected pelvic abscess is one reason for a septic peritonitis not responding to sulphapyridine.

Diagnosis

The diagnosis of a pelvic abscess is straightforward. It is based mainly on the physical signs, for the symptoms as such seldom direct attention to the rectum. The story is approximately as follows:

After an abdominal operation the chart shows a raised pulse and temperature for about a week, then after two or three days of normal readings there is a return of the elevated pulse and of pyrexia to around 100° F. with a tendency to swing. The respirations throughout are unaffected, which negatives the possibility of a subphrenic abscess or respiratory sepsis. In a few days frequency of the bowels is noticed—perhaps four to six times a day. This is regarded as satisfactory at first, for it has often been preceded by constipation. Less often the bowels remain inactive. The stools consist mainly of mucus and a little fluid faeces. The patient is toxic, with colour pale or slightly grey, and the initial progress is obviously slowed down. The hand will be found coolish, the nails white instead of pink, and the pulse is small. The tongue is moist, smooth or shiny, and bright red, and the papillae have been shed: there is an exfoliative glossitis. It is interesting to watch this tongue condition recover when the pus has been drained: the whole of it may be affected, or occasionally only the tip or sides.

The abdomen is inclined to be tight, and to be full in the lower half, and the respiratory excursion is absent or even reversed—i.e., it is indrawn on inspiration instead of moving outwards. There is seldom abdominal tenderness or rigidity. In a thin patient visible peristalsis may be observed, raising the possibility of subacute intestinal obstruction; rarely a patient vomits, further strengthening this suspicion, but if there is the possibility of "pus somewhere" it must be sought out before considering intestinal obstruction, apart from an inflammatory paralysis of the bowel.

The diagnosis is clinched by inserting a finger into the rectum. According to the stage of development of the pelvic abscess when the examination is made, one of three states will be found. They are:

1. *The Early and Suspect Stage.*—The rectum will be found empty, dilated, and warm, and the mucous membrane is smoother than usual. The rectal wall at the tip of the finger is hard and unyielding, with induration. There is no fluctuation, and the impression formed is that the rectum is "set in felt."

2. *The Abscess Declared.*—A day or two later than the above, the findings will be the same except for a significant addition: at the tip of the finger, on the anterior wall, a dimpling spot will be discernible. This is the first sign of the rectal wall softening and the abscess pointing through it. The sensation to the pulp of the finger is almost identical with that experienced on palpating the tip of the nose—i.e., there is a soft spot between the two cartilages. It will be remembered that the reflection of the peritoneum is fully a finger's length away from the anus, so that in the early stages it is necessary to press up firmly to reach high enough, and that the finger will have to pass round the first fold of mucous membrane in the rectal wall; thus the examination is a painful one for the patient. I prefer to make it with the subject in the Fowler position and the knees wide apart. The dimpling spot having been detected, the time for operation has arrived, and this is the place through which to drain the abscess.

3. *The Abscess Obvious.*—The further development is when the rectal mucous membrane becomes oedematous and hot, the first valve of the rectum is obliterated, and there is an obvious bulging protrusion into the lumen. The tense bulge is so definite that fluid pointing into the bowel is undoubted.

The Abscess Ruptures.—A fourth stage, which should rarely occur, is that of a spontaneous evacuation of pus into the rectum, and this is passed into the bed-pan as a fluid stool. The abscess should be detected clinically before this.

An "Unusual" Presentation.—When the abscess points into the rectum from the peritoneal cavity it must traverse the pelvic cellular tissue. This usually becomes so indurated that spread along this plane is automatically limited. Rarely, however, in a debilitated patient the localization is not complete, and pus may break outwards and downwards through the sacro-sciatic foramen and point as an abscess on either buttock. The process is a quick one, and constant vigilance should be maintained to detect such a collection in a patient who is not progressing and who obviously has "pus somewhere." Another possibility is the abscess pointing in the groin at the pubic spine, having tracked along the round ligament or the vas deferens.

Vaginal Abscesses.—Pelvic abscesses also discharge through the vaginal fornices, but are rare in my experience, having seen only two in eighteen years of general surgical practice.

Opening a Pelvic Abscess

It is inadvisable to attempt the operation in bed. The patient is taken to the theatre and placed in the lithotomy position. The buttocks are elevated on a sandbag and protrude over the end of the operating table. This position is carefully arranged before the anaesthetic is given. Some surgeons perform the operation without an anaesthetic, with the patient in the knee-elbow position. Since the patient is already weak and toxic, as little anaesthetic as possible is given. A whiff of gas-and-oxygen or 3 to 6 c.cm. of 5% pentothal intravenously meets the need adequately.

The Operation.—The anus is dilated to admit two fingers, using plenty of lubricant. Tearing of the mucous membrane must be avoided: such fissures would be infected. A Sims duckbill speculum is inserted into the rectum, and the lumen is thoroughly cleansed of faeces and wiped out with antiseptic swabs. The dimpling or fluctuating spot on the anterior wall is located with the tip of the left index finger, and with this as a guide a long wide-bore needle attached to a 20-c.cm. syringe is confidently thrust through the suspicious area in the rectal wall. A hesitant penetration will fail to enter the abscess cavity. Aspiration will reveal the pus. If pus is not found, carefully check that the needle has been inserted through the softening place and that it has really penetrated the rectal wall. If no pus appears then the operation is not proceeded with, and observation on alternate days is maintained. When pus is found the syringe and needle are carefully held in position. A pair of uterine dressing forceps whose points are grooved on the inside are slid along the needle through the rectal wall and into the abscess cavity. Pus immediately emerges, often surprisingly fetid and in large quantities. As the flow shows, the syringe and needles are withdrawn and the forceps blades are opened in a north-and-south and then an east-and-west direction, thus making the opening in the rectal wall generous. In the early cases I used a large pair of Mayo scissors to open these abscesses. In one case a haemorrhage began which exsanguinated the patient and made a second operation necessary two hours later, followed by transfusion. It was surmised that the rectal wall, with a large vessel, was cut during the process of closing the scissors whilst turning them from north and south to east and west. Since then the uterine dressing forceps have always been used. They are more suitable, and no complication has been encountered.

The Drainage Tube.—The drainage tube is inserted through the anus and into the opening in the rectal wall; a stitch through the perianal skin anchors it for forty-eight hours, when it is removed and not replaced. A compress of perchloride of mercury 1 in 1,000 is applied externally and changed morning and evening.

After-treatment and Progress

The after-treatment is simple. The patient is nursed in the full Fowler position. On the day of operation only water is given, by mouth; the next day fruit drinks; citrated milk is added the day afterwards, and full milk and all fluids after this. At least six pints must be taken daily. So often a fluid diet is synonymous with starvation, and it is important to feed these patients adequately. The diet is steadily built up through semi-solids to one of fish and chicken.

The subsidence of the pulse, temperature, fullness of the abdomen, and general malaise is prompt and progressive. In only one patient have I seen a failure of resolution, when a pelvic collection of pus required draining three times. On each occasion the temperature and pulse fell for five or six days and then began to swing again.

No deaths have been seen after a drained pelvic abscess, but missed ones have been found at necropsy.

Summary

The clinical picture and treatment of intraperitoneal pelvic abscess following abdominal operations are detailed. A specially modified pair of uterine dressing forceps for opening the abscess are described. All instruments used in the operation must be long-handled, for the procedure is conducted through a narrow opening of some depth.

The annual general meeting of the Governors of the Imperial Cancer Research Fund was held at the Royal College of Surgeons on April 16, with Prof. H. R. Dean, Vice-Chairman of the Council, in the chair. The thirty-eighth annual report of the Fund was approved. [The report was summarized in the *Journal* of April 26, p. 639.] The Rt. Hon. Viscount Halifax was re-elected President for the year 1941–2, and Sir Holburt Waring, Bt., was re-elected Honorary Treasurer. Sir Cuthbert Wallace, Bt., was elected a member of the Council as a representative of the Board of Governors. The meeting passed a resolution of regret at the resignation of Sir Humphry Rolleston, Bt., who had been Chairman of the Council since 1924; he is now a Vice-President of the Fund.

A CASE OF AGRANULOCYTOSIS IN AN INFANT: RECOVERY

BY

H. CECIL BARLOW, M.B., L.R.C.P., M.R.C.S.

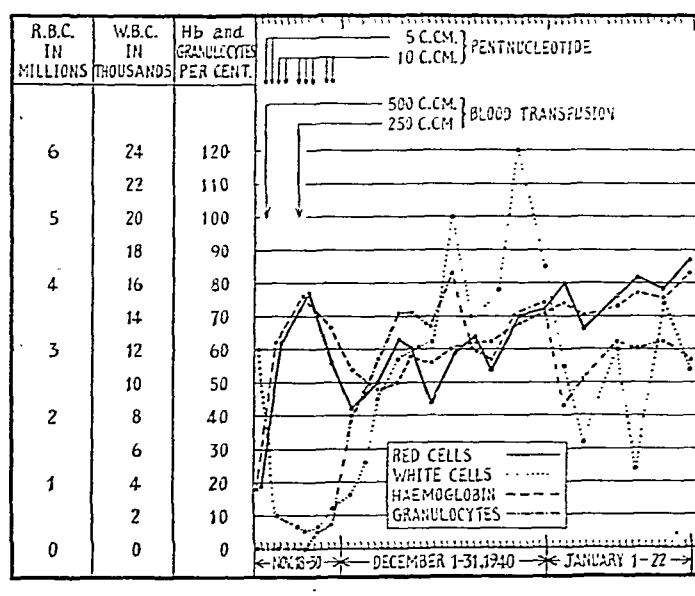
Honorary Physician, Lincoln County Hospital

The following case appears to warrant record because of its severity and the part played by blood transfusion and pentnucleotide in recovery.

Case Report

A girl aged 1 year and 11 months was admitted to hospital on November 16, 1940, obviously very ill. Dr. J. S. Topping, her doctor, gives the following account of her illness.

She was seen first on October 25, 1940. She was pale, seemed ill, and would not put any weight on the left leg; she appeared to have pain in the left knee. She was put to bed, the left leg was wrapped in wool, and she was given 7½ grains of sodium salicylate with 15 grains of sodium bicarbonate every four hours. On October 28 the temperature was 100° and the pulse 90, and she seemed better. Up to November 1 the temperature and pulse remained the same, but the leg was better and she could stand on it. On November 4 she began to have bouts of crying and kept putting her hand to her right ear; there was some congestion of the fauces and the right ear-drum was inflamed. The temperature was 101° and the pulse 100. For the next few days the bouts continued, and she was seen by an aural surgeon, Mr. J. J. Rainforth, who reported that there was no evidence of mastoiditis and advised sulphapyridine (M & B 693). During the whole of this part of the illness no other physical signs of disease were observed; in particular there was no enlargement of glands nor was the spleen to be felt. On November 11 she was given 0.125 gramme of sulphapyridine twice a day, and this was continued for five days, making a total of 1¼ grammes. The ear symptoms ceased, but she seemed so ill that she was sent to hospital.



On admission she was profoundly anaemic. Examination of the blood showed only 930,000 red cells per c.mm., and the haemoglobin was down to 18%. White cells were 12,000 per c.mm., with a differential count showing 5% large lymphocytes, 2% lymphoblasts, 93% small lymphocytes; no granulocytes could be found. She was poorly nourished, but apart from the extreme anaemia there was no evidence of disease in any organs. There was no ulceration of the mouth, fauces, or tonsils; neither the spleen nor the glands were enlarged, nor were they ever found to be enlarged during the whole course of her illness. The temperature for the first four days after admission ranged between 101° and normal; after then it ranged between 103° and 100° from November 20 to December 3, when it subsided by lysis and was normal on December 9. There was no obvious cause for the fever except the septic condition in the arms, at the sites of the blood transfusions. At one time there was a little bronchitis. The pulse ranged between 135 and 155.

On November 19 the patient received a transfusion of 500 c.cm. of citrated blood by the drip method and an intramuscular injection of 5 c.cm. of pentnucleotide. Her general condition improved immensely almost at once, but no granulocytes were to be found in the blood. The pentnucleotide was given twice a day for the following ten days and she had a further blood transfusion of 250 c.cm. on November 24.

The accompanying graph is a record of the blood picture from November 18, 1940, to January 22, 1941. It shows the rapid rise in the red cells and haemoglobin after the first blood transfusion. From November 18 to 25, after prolonged search, but not a single polymorph could be found in the blood films, although the pentnucleotide was being given regularly; and it was not until fourteen doses had been taken that any appeared, and then there was a rapid rise to 40%, fourteen days after the pentnucleotide had been begun. This rise steadily continued until a maximum of 83% was reached on December 17; after that there was a decline to normal. The number of white cells showed a remarkable fluctuation: from 12,000 on admission they fell rapidly to as low as 1,000 seven days later, after which they rose steadily to 12,000 by December 12; and, later, two counts of 20,000 and 24,000 were registered when sepsis was most marked in the transfusion wounds.

The general appearance of the child was remarkably improved after the first transfusion, but for a month she was listless and fretful, was difficult to feed, and showed a pronounced hypotonia. The sites of transfusion at the elbows became septic and sloughs appeared, and there was a complete agranulocytosis. The outlook seemed grave, but as soon as polymorphs began to be present the wounds became more healthy and slowly healed. A week after the second transfusion she became slightly jaundiced, but this cleared up in five days. In the beginning of January an indurated swelling appeared in the right buttock at the site of one of the injections of pentnucleotide; this was absorbed in ten days. During the last three weeks in hospital she steadily improved, and eventually could run about, took food well, and was happy and contented. A short course of light treatment seemed to help. She was discharged from hospital on February 1.

Commentary

At first the blood picture seemed to suggest an aleukaemic lymphatic leukaemia, but the progress of the case negatived any form of leukaemia. For several days, in spite of the most careful search, not a granulocyte could be found, and yet there were never any signs of throat infection. There is evidence that the child was anaemic before the sulphapyridine was given, and this condition, with a possible idiosyncrasy for the drug, may have so poisoned the marrow that it failed to produce any granulocytes. When the wounds at the elbows became septic it was feared that the infection would spread owing to lack of resistance. It was most noticeable how quickly the sores began to heal as soon as the polymorphs appeared. It is to be noted that after the transfusion the number of

ied cells and the percentage of haemoglobin greatly increased, but there was no improvement in the white cell count—rather the reverse. Another point to note is that the pentnucleotide was given for eight days before the polymorphs began to appear.

I am indebted to Mr. W. Chandler for the very careful blood counts.

Clinical Memoranda

Fatal Case of Burns Complicated by Gas Gangrene and Acute Duodenal Ulceration

The occurrence of two of the rarer complications of burns in the following case makes it worthy of note.

CASE RECORD

A man aged 60 incurred extensive third- and fourth-degree burns of the left leg and thigh owing to the scattering of the coals from his grate through a bomb explosion. The burns were cleansed under general anaesthesia, and tannic acid was applied. Two days later he was transferred to an emergency hospital. On the fourth day the general and local condition were satisfactory. At 11 a.m. on the fifth day gas and fluid were present in the calf of the leg. The pulse was 100 and the temperature 99°. One gramme of sulphapyridine (M & B 693) was injected intravenously. By 2 p.m., the time arranged for operation, the gas had spread to the mid-thigh. All muscle groups were invaded. A circular amputation 4 inches below the hip-joint was performed and the stump was covered with sulphanilamide powder. A further 1 gramme of sulphapyridine was injected intravenously. From the fifth to the eleventh day the patient was given 15 grammes of sulphapyridine orally and 5 grammes of prontosil album, the latter preparation being retained after the former had caused vomiting. 7.2 c.cm. of anti-gas-gangrene serum was also given. On the twelfth day his general condition was fair. The temperature was normal and the pulse 80. The stump was fairly clean, and there was no gas in the limb. Severe melaena developed on the sixteenth day and continued until his death nineteen days after the burns were incurred. Repeated blood transfusions had been given.

Swabs and a portion of muscle were examined on the day of operation. A film showed debris and Gram-positive bacilli. Anaerobic culture revealed large Gram-positive bacilli with subterminal spores and *B. pyocyaneus*, and demonstrated Gram-positive bacilli forming a stormy clot in milk—? *B. welchii*.

At necropsy an ulcer the size of a shilling was seen on the anterior wall of the first part of the duodenum. The second and third portions were moderately injected. There was old blood clot in the bowel. The stump was clean. There were no other pathological changes.

Microscopical examination revealed disintegrating mucosa. The surface epithelium had been shed, but glands were present in the submucosa. On the surface there was a suggestion of a serous exudate, with some round-celled infiltration. No evidence of fibrous tissue formation was observed, nor was there any other sign of chronic inflammation. The general appearances suggested some acute necrotic process.

This case and a similar one occurring previously have impressed upon me the importance of examining all cases of burns daily for gas infection. The rapidity of spread in the subcutaneous tissue—about eighteen inches in three hours—is remarkable. Whether the same rate of spread occurred in the muscles it is more difficult to assess.

JAMES MORONEY, M.B., Ch.B.,
Resident Surgical Officer to an Emergency Hospital.

Reviews

OFFICIAL HISTORY OF THE A.A.M.S.

The Australian Army Medical Services in the War of 1914–18. Vol. II. The Official History of the Australian Army Medical Service in the War 1914–18. The Western Front. By Colonel A. G. Butler, D.S.O., V.D., M.B., Ch.B. (Pp. 1,010; 212 illustrations, maps and graphs. 21s.) Canberra: Australian War Memorial. 1940.

The second volume of the story of the services of the A.A.M.C. in the last war is a worthy successor of the former one, which received our favourable comments. Colonel A. G. Butler, the editor, has taken a liberal view of his functions and has again given a fascinating story of the relation of the medical services to the fighting, this time on the Western Front, from the arrival of the Australians early in 1916, when the line had become fixed and trench warfare extended from the Belgian coast to the Swiss border, through the stage of attrition when heavy losses were suffered and a great number of casualties were caused by the attempts to batter the opposing lines, to the terminal war of movement, attack and counter-attack, which ended in the defeat of the German armies. The narrative chapters are followed by considerations of the special medical problems involved in each of these phases, and the administrative problems of the treatment and evacuation of lightly and severely wounded from France to the advanced base in the United Kingdom and ultimately to Australia. Changing problems required changed methods of tackling them, and high praise is given to the first Director of Australian Medical Services, Sir Neville Howse, and his staff for the way in which these problems were successfully solved. Details of surgical and medical treatment are naturally omitted, but a full discussion of the machinery of prevention of disease is given.

Colonel Butler is well qualified for the task he has carried through so successfully, because he saw service in the field as regimental medical officer, as commanding officer of a field ambulance, and as a member of the Corps staff. He has drawn his material from many sources, ranging from personal diaries and letters, written while the events described were shaping themselves, to the official medical histories of our allies and our enemies. The extracts made are apposite, illuminating the point under discussion, never redundant, and under the editor's skilled hand fitting aptly into the picture. It is interesting to trace the evolution of methods of evacuating the wounded under varying conditions of fighting on the Western Front and as experience grew. In this connexion reference is made to the distinguished service of Major-General G. W. Barber, D.D.M.S., Australian Corps, and his standing orders for the A.A.M.C. under his command are set out in full in an appendix. A special problem was that Great Britain was really an advanced base, and full tribute is paid to the work of Colonel D. M. McWhae in organizing the A.I.F. depots in the United Kingdom and dealing with the ultimate return of sick and wounded men to Australia. Throughout the volume the name of Sir Neville Howse recurs constantly, and the last chapter deals with the personality, policy, and outlook of the D.M.S., A.I.F., who wielded such power in the Australian Medical Services. It is a shrewd and well-informed appreciation of a great Australian.

Colonel Butler has produced a treatise rather than a history, and is to be congratulated on a valuable contribution to medical war literature of interest to many outside Australia. The print is clear, the illustrations (photographs, maps, diagrams, and sketches) are well chosen and

well produced. There is a comprehensive index, personal and general, and cross-references and notes are full and well arranged.

TEACHING THE DEAF CHILD TO SPEAK

Speech Training for the Deaf Child. By Sylvian M. Martin. With a foreword by W. Kingdon Ward. (Pp. 114 Cloth, 5s.; paper, 3s. 6d.) London: George Allen and Unwin, Ltd.

The situation of the deaf child is one of grave handicap at any time, and difficulties of transport must increase this seriously in time of war, for the special schools and clinics are not numerous. It is important, too, that the teaching of the child should begin as soon as the deafness is recognized, and also that the child should be taught in the right way. *Speech Training for the Deaf Child*, by Sylvian M. Martin, is a guide for mothers or relatives who may have to undertake the task of teaching a deaf child to speak. In concise and clear writing it is explained how this should be done, how the initial difficulties can be overcome, and how the training can be developed. The patience required to make the first contact with the mind of the deaf child by means of speech is emphasized repeatedly, and the teacher is encouraged by the assurance that often the child is absorbing quietly under an appearance of indifference, until it suddenly shows interest and responds.

The book is in two parts, the first dealing with the training of the deaf-mute child, and the second with the slightly deaf child. The explanations and examples of how the training should proceed are most thorough, and if they could be put into practice would enable the parent to teach the child so that the power of clear and intelligible speech is acquired. Anyone who has seen the patience, enthusiasm, and understanding which the skilled and trained teacher brings to her task must feel some doubt whether the parent can accomplish very much from the directions on the printed page, excellent as they are. If, however, circumstances are such that it must be done that way this little book by Miss Martin is an excellent guide and would be difficult to improve.

MANAGEMENT OF FRACTURES

A Complete Outline of Fractures (including Fractures of the Skull): For Students and Practitioners. By J. Grant Bonnin, M.B., B.S., F.R.C.S., M.R.C.O.G. (Pp. 508; illustrated. 25s. net.) London: William Heinemann (Medical Books), Ltd. 1941.

Of late several comprehensive works on fractures have appeared, perhaps as a reaction to the importance of the subject at the present juncture. The book under review is an addition whose form and content may be considered to justify its entering the field. Mr. Bonnin has managed to include a consideration of the whole subject within some 500 pages of a compact volume. In addition there are two short chapters on dislocations. There is nothing original in his approach to the various problems involved in the subject, but he gives a clear statement of the most recent views in these sections in which progress or change can be recorded during the past five or ten years. The essentially practical nature of the subject is clearly recognized, and the illustrations are mostly useful and assist in the clarification of the text.

The chapter on plaster technique is excellent and contains some commonsense observations on the dangers of unpadded casts. The author has not been frightened by the specialization devoted nowadays to head injuries and has produced a chapter on the subject which should fully serve the surgeon dealing with casualties. Acute traumatic bone atrophy receives some notice, but the author gives little intimation of the appearance of the condition elsewhere than in the hand. Admittedly the pathology of this condition remains obscure, but it is by no means rare in the lower extremity and in isolated long bones. The prognosis in these areas is better than is suggested in the volume under review.

The least convincing section is that on compound fractures. The author does not define clearly the limit of skin excision desirable in the operative treatment of these cases. He advocates the use of a window in the plaster over the wound—a practice which has little support in most circles at the present time. Again, his enthusiasm for primary suture will not be shared by all surgeons. It is perhaps unfair to make these criticisms of a textbook: the subject of wound treatment looms so large at the present time, and individual opinions on the subject are so firmly held, that close conformity of opinion on the subject is hardly to be expected. The absence of a definite recommendation in regard to the use of the sulphonamide group of drugs in prophylaxis and a somewhat sketchy paragraph on gas gangrene are subject to the above observations.

There is a suggestion in the introduction that the book is mainly designed for the use of students. It will certainly serve them well, but it also offers a sound working guide to those surgeons who are now perhaps unexpectedly concerned with the treatment of injuries.

PRACTICAL DIETETICS

Dietetics Simplified. The Use of Foods in Health and Disease. By L. Jean Bogert, Ph.D. With Laboratory Section by Mame T. Porter, M.A. Second edition. (Pp. 742. 12s. 6d. net.) New York and London: The Macmillan Company. 1940.

The best way to review a book is to use it, and as one who has made considerable use of the first edition of Bogert and Porter the reviewer can say that it is an extremely useful and practical manual of dietetics. The second edition maintains the virtues of the first, among which we may enumerate attractive format and illustrations, adequate but not excessive physiological and clinical details, and clearly described diet schemes and recipes. Each chapter is followed by "Discussion Questions and Problems," and though the book has been planned for nurses and medical students, as well as others interested in dietetics, we cannot help feeling that the average graduate in medicine in this country would fail on these quizzes. And this, it seems to us, reflects not so much the high ideals of educative practice in the U.S.A. as the distortion of the British medical curriculum. A recent analysis of the bed costs in a provincial teaching hospital showed that nearly three times as much per patient was spent on provisions as on drugs and surgical materials. Yet, whereas the student receives extensive instruction in the action and prescription of drugs and the dressing of wounds and fractures, he receives practically none in dietetics. Every layman knows that drugs and operations are of little value in the chronic diseases which vex mankind, such as rheumatism, chest diseases, dyspepsia, and psychoneurosis, but though the medical profession pays lip service to such ideas as prophylaxis, physiotherapy, mental healing, and improved nutrition, no corresponding revolution has occurred in the curriculum. The average faculty of medicine acts on the belief that what was good enough for Astley Cooper, Bright, and Addison is good enough for to-day. It is difficult to see how this excessive conservatism can be overcome without strong pressure from without, but books on dietetics so attractively written and produced as Bogert and Porter cannot fail to exert an influence for improvement.

Notes on Books

Clinical Pellagra, by Prof. SEALE HARRIS of Alabama, is a work of collaboration in which ten other people have taken part. Prof. E. V. McCollum, in a brief foreword, describes it as a "philosophic treatment of clinical and experimental data of many kinds, contributed by many able workers who have contributed to the development of our knowledge of the biochemistry of nutrition and of the biologic agencies which act in conjunction with malnutritional states to undermine and pervert physiologic functions of certain types." It is not until Chapters 18 and 19 are reached that the editor-in-chief gives his description of the symptomatology and clinical manifestations of pellagra, and the general presentation lacks sequence. This book, of nearly 500 pages with many illustrations, is published by Henry Kimpton at 35s.

The Educational Advisory Board of the British Social Hygiene Council has issued a memorandum entitled "Human Biology and the Crisis in the Public Schools." It is obtainable from the British Social Hygiene Council, Tavistock House South, Tavistock Square, W.C.1.

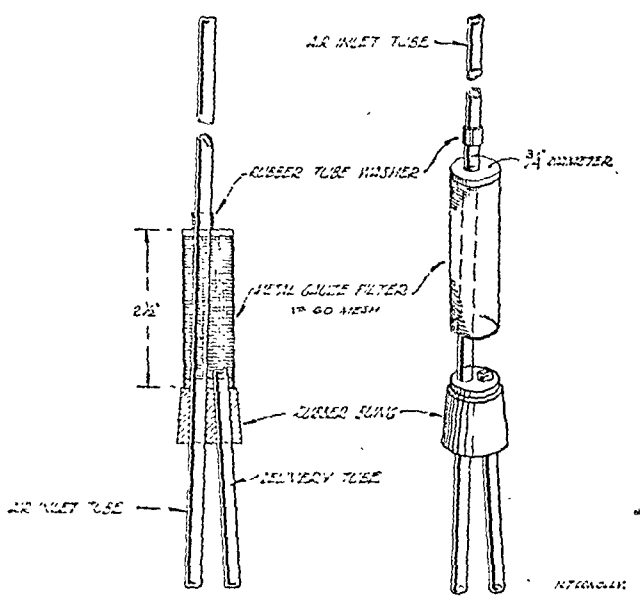
Preparations and Appliances

A SIMPLE FILTER FOR PLASMA OR STORED BLOOD TRANSFUSION

Mr. Thomas C. J. O'CONNELL, M.D., M.Ch., assistant surgeon to St. Vincent's Hospital, Dublin, writes:

Various methods have been used in the filtration of stored blood or plasma before it is delivered into the patient's vein. The presence of fibrin will, under certain circumstances, lead to the formation of "clots," which take the form of either large masses or small flakes distributed throughout the medium. Filters used for the removal of these clots have been classified briefly as those situated (*a*) in the bottle containing the fluid; (*b*) outside the bottle.

The popular "gas mantle" filter has the obvious disadvantage that it must be renewed after each delivery. Types



SECTION THROUGH ASSEMBLED FILTER *FILTER PARTLY DISMANTLED*

of this filter have been placed both in the bottle and in the delivery "line." Glass beads have also been used for the purposes of filtration. When placed outside the bottle they must be enclosed in a special glass container. They present certain difficulties in cleaning, and are of course vulnerable. Metal filters outside the bottle have been employed with success, but they must be enclosed in glass containers—a method which leads to complexity of design. It is felt that filters situated in the delivery "line" cannot be entirely successful. When fibrin masses are relatively large they may block the outlet from the bottle. Shaking the bottle may dislodge them, but as often as not the entire delivery set must be removed and cleaned.

A filter placed within the receptacle itself would solve many of these difficulties. It is important, however, that such a filter should form part of the "giving set," be easily removed for cleaning, and be relatively cheap. It should, of course, stand up to all sterilizing processes, but should not corrode.

A filter on these lines has been devised by me. It is designed for use with the M.R.C. bottles which are to a great extent employed in blood or plasma storage. In principle, however, it may be used with any form of delivery set. It consists of a cylindrical metal filter, loosely fitted to the rubber bung and retained in place by the air-inlet tube, on which a small piece of rubber tubing is placed. It offers a large filtration surface, is easily removed and cleaned, and is relatively cheap and sturdy. The filter is made from copper gauze of size 60 mesh. This metal was found to be quite satisfactory, but stainless steel is preferable. The exigencies of war, however, prevent its use.

The diagrams illustrate the dimensions and fitting of the filter, which is supplied by Fannin and Co., Grafton Street, Dublin.

PERCALCIN

"Percalcin" (Evans Sons Lescher and Webb, Ltd.) is a solution of calcium in combination with mixed acids derived from glucose. The solution contains the equivalent of 1 gramme of calcium hydroxide in 25 c.cm. This is two and a half times as strong a calcium concentration as that contained in 10% calcium gluconate. Non-irritant solutions of calcium of this type suitable for intravenous or intramuscular administration are finding an increasing number of therapeutic uses. They are known to be of value in such conditions as tetany and urticaria. The vendors have prepared a pamphlet on the subject in which they suggest the use of percalcin in a wide variety of diseases.

IMMUNIZATION AGAINST ENTERIC FEVER AND TETANUS

We have received from Messrs. Burroughs Wellcome and Co. samples of two new products for active immunization against enteric fever. "T.P.3" is the designation given to a vaccine of the ordinary type containing 1,000 million *Bact. typhosum* and 750 million each of *Bact. paratyphosum* A, B, and C in each c.cm. Of the two recommended systems of administration, doses of 0.5 and 1 c.cm. are those adopted in the Army; the extra trouble involved in giving 0.1, 0.5, and 0.75 c.cm. with the same interval of seven to ten days between them is repaid by reactions of reduced severity. This product is available in rubber-capped phials containing 1.5 c.cm. (enough for the immunization of one person) as well as in 25 c.cm. bottles.

"T.A.B.T." is a mixture of T.A.B. vaccine (*Bact. paratyphosum* C being omitted from this preparation) and tetanus toxoid, made in two different proportions, each containing 1 c.cm. of tetanus toxoid, while one mixture also includes the bacterial content of 0.5 c.cm. of T.A.B. vaccine, and the second that of 1 c.cm. These mixtures are available either in single doses or in 25 c.cm. bottles. It is recommended that the two doses be given with an interval of not less than one month. The efficiency of immunization with tetanus toxoid is now fully accepted, and combination with T.A.B. vaccine has been found to increase it. The combined product causes no more reaction than the vaccine alone.

COATED AMMONIUM CHLORIDE TABLOIDS

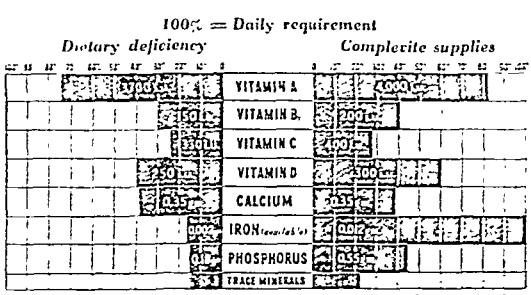
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VITAMIN AND MINERAL DEFICIENCIES

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Vitamin B_2 (riboflavin) ..	0.9 mg. per oz.
P.P. factor (nicotinic acid)	1.1 mg. per oz.
Vitamin B_6 (adermin) ..	Richest source.

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BRITISH MEDICAL JOURNAL
LONDON
SATURDAY MAY 3 1941

THE WINTER EPIDEMICS

At the beginning of the past winter the public health authorities, as a consequence of the drastic changes in the social habits of the population following the intensive air raids, had serious forebodings as to the health of the community. It was feared that owing to the herd life lived by those who frequented shelters the incidence of infections might reach alarming proportions. Epidemic diseases, apart from their epidemicity, have a seasonal incidence. Their prevalence increases in the autumn, reaches a maximum in the early spring, and falls to a minimum in the late summer. It is common knowledge that there was no major prevalence of any specific infectious disease during the past winter, but it is of interest to review the general position in some detail. A table showing the incidence of some of the notifiable diseases in England and Wales during the winters of the past five years is included in the Epidemiological Notes for the week.

Anything approaching an exact comparison of influenza mortality with preceding years cannot be made yet, as the death records available relate only to the large towns, and the population of these areas has been seriously disturbed by evacuation, especially in the larger cities. Greater London accounted for two-fifths of the total population of the 126 large towns in peacetime. There were 2,217 deaths registered from influenza in the great towns during the first quarter of 1941. This was less than one-third of the total registered in the corresponding period of 1937 and about one-fifth of that in 1933, years in which influenza was very prevalent. Even if the figures for the large towns in 1941 give a gross understatement of the true position, it is evident, without being able to specify the exact size of the epidemic, that influenza mortality has not differed much from that of peacetime and is certainly below the level of some recent outbreaks. In the past winter the number of cases of pneumonia notified was slightly less than in the preceding winter and decidedly below the average of the triennium before the war. The notifications of enteric fever were greater than in the preceding period, but below the average for the winters of 1936–9. Dysentery also showed an increased incidence; nearly three times more cases were recorded in the past half-year than in the first winter of war, but the total was below the average of the pre-war triennium. Notifications of dysentery during recent months showed that there have been fairly severe localized outbreaks in widely separated areas. The number of notifications of cerebrospinal fever, 6,138, was nine times greater than the average for the immediate pre-war period, and although it was 706 above the number reported in the preceding winter the epidemic was not so severe. The increased incidence was due to the disease remaining at a much higher endemic level after the outbreak in the beginning of 1940 than before it; in the last quarter of 1940 there were 1,806 cases reported, as compared with 339 in the last quarter of 1939. The maximum weekly notifications were 406 in 1941 and 603 in 1940, while for the preceding four years no weekly total exceeded 50.

Of the common infectious diseases of childhood, more cases of both scarlet fever and diphtheria have been reported than in the preceding winter, when the incidence of these diseases was very low. The notifications of scarlet fever were only three-quarters of the average for the three winters immediately preceding the war, while the incidence of diphtheria was 90%. These diseases have not displayed an epidemic peak but rather a fluctuating seasonal rise. With regard to measles and whooping-cough, these diseases were not generally notifiable until November, 1939, so that it would be necessary to use the mortality rates for making a comparison over a series of years, and these are available only for the large towns. For purposes of comparison, the objection raised in the case of influenza to the use of the deaths for these areas would be more serious in the case of diseases of childhood, as the transference of children from large cities to areas with a low density figure was the principal feature of the evacuation scheme. The number of cases of whooping-cough, 44,160, reported in the first quarter of 1941 was six times that in the corresponding period of 1940, and the incidence has shown a distinct rise in the last few weeks. This increase is in agreement with the trend of the mortality curve of peacetime, which displayed a maximum in the beginning of the second quarter. This peak was absent from the 1940 returns. Notifications of measles numbered 204,158 in the first quarter of 1941 and were four times those recorded in the same period of 1940. The recent trend of the measles curve has been of interest, the most striking feature being the failure of the biennial epidemic, expected in 1940, to appear. The obvious explanation—the evacuation of children to country areas—may not be the correct one, because, judging from the mortality, the usual high spring peak was absent in 1939. The trend of the curve of measles mortality was practically horizontal between the thirtieth week of 1938 and the thirtieth week of 1940.

Despite the herding together of large numbers of the population in air-raid shelters the epidemics of the past winter have been, on the whole, below the average. The rather unsatisfactory position of dysentery and the large increase in cerebrospinal fever were not due to conditions arising out of air raids. In the large towns the effects of the new conditions of life upon the incidence of the common nasopharyngeal infections, colds, chills, etc., can only be a matter of conjecture, as no data are available on this point.

ATTACK ON RHEUMATISM

Planning for a better world is popular at the present time, and is one of the most striking signs of the confidence felt by the nation in the ultimate outcome of the war. No dreams of aggrandizement are entertained, but a determination that the world shall be made a better place to live in. While there may be differences of opinion as to how this should be brought about, few will disagree that one of the first steps must be to build on the ruins created by the air-raids better houses in better surroundings, and in this and kindred ways to raise the standard of living and lessen the incidence of disease. With this aim in view, although the idea had its birth in pre-war days, Lord Horder, as chairman of the Empire Rheumatism Council, has drawn up a "Plan for National Action"[1] to deal with rheumatic diseases. The various forms of rheumatism present one of the most important unsolved medical problems in the community. The economic damage resulting from them is estimated to exceed £25,000,000 a year in England and Wales, while the toll of pain and disablement is enormous. The American Committee for the Control of Rheumatism in its *Primer on Rheumatism* (1934) stated: "Chronic arthritis is generally recognized in all European and North American countries as the most important problem that chronic disease presents. . . . A careful house-to-house survey in the State of Massachusetts has shown that there are more cases of chronic rheumatism to-day than of heart disease, tuberculosis, and cancer combined."

Some education authorities, notably the London County Council, have done important work and achieved striking results in dealing with rheumatism in children. The School Rheumatism Supervisory Scheme of the L.C.C. is probably the best of such existing organizations. But the figures already quoted refer to chronic rheumatism in adults. Little has been done to provide systematic treatment and, what is of equal importance, to instruct adults in the best preventive measures to take against rheumatic disease. The nature of specific infection in acute rheumatism has yet to be demonstrated, though important work is being carried out by one of the Research Fellows of the Empire Rheumatism Council and by other investigators. While there is much evidence that bacterial infection is important in rheumatoid arthritis, it is certain that there are other aetiological factors of equal or perhaps greater significance. Such factors are briefly discussed in the booklet describing Lord Horder's plan: heredity, occupation, diet, climate, housing conditions, and psychical influences are all of importance, and nerve strain must not be overlooked. It is to be seen whether the dietetic restrictions imposed by the war will in the long run be harmful or beneficial; but it is more than likely that as a result of war conditions rheumatism will be more prevalent, not only among troops exposed to the conditions of active service, but also among civilians as a result of shelter life, ruined homes, strenuous work in munition factories, warden duty, fire watching, and so on. In any case, a preventive campaign must stress the part which these various factors may play in aggravating the disease.

Lord Horder touches on these preventive measures, but his main purpose is curative: "to note the existing facilities for treatment and to suggest how they can be extended." The principal methods at present in vogue are critically considered, and it is concluded that some are likely to be used only in a small percentage of cases and that a national plan of treatment would at first provide only for those methods which are likely to be of service in the majority of cases. The principle suggested is the concentration, at a few appropriate centres, of specialist knowledge and equipment, with subsidiary centres grouped around them but situated in populous places. The specialized rheumatism treatment centres would use as a nucleus existing institutions such as the spa hospitals, the Red Cross and other clinics, and such general hospitals as have established special rheumatism departments. The function of these specialized centres would be to provide postgraduate training and to carry out research in its widest sense. They would have beds for the treatment of serious cases referred from the subsidiary centres, whose duty would be to provide material for clinical research and teaching. Although not specified in the "Plan," it would be an advantage to provide instruction for fifth-year students, because those who go into general practice will find rheumatic diseases responsible for a large proportion of their daily work.

The local treatment centres would work on the lines of an out-patient department. Equipment for the most useful forms of physical treatment would be required on an adequate scale. A staff of trained masseurs and of special service workers would also be needed. Their task would be to see that simple home treatment was properly carried out and to remedy so far as possible faulty conditions of living. The directors of the local centres would devote their whole time to the work and should have been specially trained for it. It would fall to their lot to determine how far the subjective symptoms not infrequently put forward by the "work-shy" were justified. The scheme should so far as possible allow the general practitioner to make use of the facilities available at the centre. Under present conditions physical measures, which are generally admitted to be of the first importance in the treatment of rheumatism, are available for very few. For juvenile rheumatism the existing machinery for maternity and child welfare could be readily expanded to include the resources of the special centres and to make these available for those who cannot be treated and supervised at home. But for rheumatism in the adult new machinery and equipment would in most places have to be established.

Already child welfare and ante-natal clinics, and in many districts the out-patient departments of the large general hospitals, have encroached on private practice, and it is clear that Lord Horder's scheme would, unless very carefully organized, make still another inroad. As already suggested, however, it should not be impossible to devise a scheme which would enable the patient's home doctor to participate in the treatment of his patients. He would in this way gain knowledge of the greatest value to him in his daily work. The "Plan" deserves careful study by all concerned.

[1] *Rheumatism: A Plan for National Action*, by Lord Horder. H. K. Lewis and Co., Ltd. (2s.)

METHODS OF AIR DISINFECTION

It will not have escaped the notice of any assiduous reader that since the war began strenuous attempts have been made by several groups of workers to perfect a method for disinfecting closed atmospheres chemically. Had any such method been in general use in air-raid shelters and elsewhere during the past winter, the incautious observer might have been tempted to attribute to it the low incidence of cerebrospinal fever, influenza, and pneumonia under conditions which were expected to produce severe epidemics. This is not to imply that the disinfection of air may not be a valuable safeguard when air-borne epidemics have in fact begun, and in the breathing space which summer conditions should afford it will be well to take stock of progress in this matter. It is perhaps not generally understood that no fewer than five distinct methods of disinfecting air have been proposed. Ultra-violet light so applied as to be efficient requires an installation of prohibitive cost for large-scale use, and as it is almost without effect on bacteria in dust particles filtration is also necessary. Smokes are advocated by C. C. Twort and A. H. Baker,[1] who arrived at their present conclusions by way of experiments to determine whether tobacco smoke would interfere with the action of disinfectants suspended in the air; this it did, and the smoke itself had no disinfecting action, in spite of popular belief to the contrary, but smoke from smouldering cardboard or incense was unexpectedly found to be highly bactericidal. They dryly remark that "the practice of burning incense during religious ceremonial has a rational basis," as if the priests of some three thousand years ago who introduced this practice were directed by the same instinct in matters of hygiene as seems to have inspired many injunctions in Leviticus and Deuteronomy. The three methods which on present evidence appear to have a more serious claim to attention all consist in projecting a spray of disinfectant solution in the form of fine droplets; the differences between them lie not so much in the nature of the solution used as in the behaviour of the droplets so formed. According to A. H. Dodd,[2] who does not specify the material to be used but may be understood to refer to an emulsified disinfectant of coal-tar origin, spraying of a dilute solution should be continued until the evaporation of finer droplets has saturated the atmosphere with water vapour; condensation then takes place on any solid particles containing bacteria, which are carried to the ground, where disinfection is completed in a fluid film also produced by the spraying. This proceeding, assuming that it can be made to act in this way, has the merit of dealing also with floor dust. The "aerosol" theory, on the other hand, postulates contact between minute droplets of disinfectant solution and bacteria or infected solid particles; this takes place in suspension in the air, and to achieve it the qualities demanded of the disinfectant droplet are small size and persistence; the latter quality has been attained by the use of glycerin or other non-evaporating solvents. It seems clear from the work of C. C. Twort and his colleagues[3] and C. H. Andrewes and others[4] that certain phenolic disinfectants used in this way are highly efficient: the best according to Andrewes is a solution of hexyl-resorcinol in propylene glycol, but these two substances are not at present available in adequate amounts for large-scale use. He accordingly recommends the use of a sodium hypochlorite solution, which is readily manufactured in unlimited quantities, is efficient, harmless, and almost odourless, and is itself a deodorant. This is the method which has been consistently advocated by A. T. Masterman,[5] who has now published a spirited rejoinder to the paper of A. H. Baker, S. R. Finn, and C. C. Twort,[6] in which they cast doubts on the efficiency and practicability of aerial disinfection by means of hypochlorite solutions. Their mistakes, according to Masterman, include not only technical imperfections such as the employment of inefficient atomizers, but the assumption that the "aerosol" theory is applicable to this method. He describes observations which show that minute droplets of a hypochlorite solution evaporate with extreme rapidity, and the product, owing to interaction with atmospheric carbon dioxide, is hypochlorous acid gas. This, then, is a third and totally distinct effect of spraying—the formation of a bactericidal gas. The advocates of these different methods stand at the three points of a controversial triangle of no small interest, and it would be premature to pass judgment on the differences between them. It may confidently be said, however, that the hypochlorite method has more experimental work behind it than any other: phenolic disinfectants acting as aerosols are efficient but expensive or in short supply, while the idea of washing bacteria out of the air and killing them on the ground at present lacks the support of adequate experimental data.

[1] *Lancet*, 1940, 2, 587.
[2] *Med. Officer*, 1940, 64, 149.
[3] *J. Hyg., Camb.*, 1940, 40, 253.
[4] *Lancet*, 1940, 2, 770.
[5] *J. Hyg., Camb.*, 1941, 41, 44.
[6] *Ibid.*, 1940, 40, 560.

DANGERS OF POSTERIOR PITUITARY EXTRACT IN LABOUR

A drug whose power was not fully appreciated became available when the action of extracts of the posterior lobe of the pituitary on uterine muscle was discovered. There were many who heralded the discovery as marking a new era in obstetrics, and in some clinics the available preparations were spoken of as being "physiological forceps." The physiologist has shown that the uterine response to pituitary stimulation is not so simple as was at first thought, and over twenty-five years of clinical experience have revealed dangers which were unsuspected. The use of pituitary extracts in labour was reviewed recently at the ninety-first Annual Session of the American Medical Association in New York, when papers were read before the Section of Obstetrics and Gynaecology by Drs. Sharkey, Pendleton, and DeLee.[7] In spite of the wide use of the hormone during the first and second stages of labour—a practice which was deplored by all three speakers—it is to be noted that in the discussion following the papers no speaker rose to defend this. DeLee referred to the increasing demand among American women for "streamlined labour," and stated characteristically that such a labour could be as safe as a streamlined parachute. Reynolds has shown that posterior pituitary preparations produce tetanic contractions of the uterus, and stress was laid on the dangers to the mother and the foetus when this happens during labour. Cerebral damage with stillbirth and neonatal death, maternal lacerations, uterine rupture, and damage to the pelvic floor with resultant prolapse are the most common complications. DeLee stated that the number of cases of uterine rupture due to the administration of pituitary extract would never be known, for either the cases were not reported or the patient was buried and the death recorded as being due to shock, haemorrhage, or embolism. Attention was drawn to the important fact that even doses as small as 3 minims (0.2 c.cm.) can be dangerous to the mother and the child, and it was claimed that there was no evidence to suggest that compound preparations such as thymophysin are any safer than

[7] *J. Amer. med. Ass.*, 1940, 115, 1315, 1318, 1320.

pituitrin or pitocin. In an analysis of the records of St. Vincent's Hospital, Kansas City, Dr. Pendleton found that when pituitary preparations were given during labour operative intervention was increased and the stillbirth and neonatal death rates were more than doubled. The speakers agreed that the use of pituitary preparations during labour placed a grave responsibility on the obstetrician, a responsibility which he is wise to avoid. While remembering the dangers associated with the abuse of these preparations, it is well to acknowledge the service they can safely render when employed with care. Pituitrin helps the uterus to expel its contents during the process of abortion, and in those cases in which evacuation of the uterus is necessary an initial injection of pituitrin into the cervix reduces haemorrhage to a minimum and greatly lessens the risk of perforation. Pituitrin is also of value in the induction of labour; but should be administered in small doses—for example, 0.25 c.cm.—which may be repeated at half-hourly intervals but must be discontinued if pains begin. It must not be given if a placenta praevia is suspected. During labour the hormone should not be used, and in a prolonged second stage an episiotomy or an instrumental delivery is safer than the "physiological forceps." In post-partum haemorrhage the drug is most valuable but has no advantage over ergometrine, and has the great disadvantage that on rare occasions it gives rise to severe shock.

INDIAN HEMP

The hemp drugs are derived from the resinous extract of the female flowers of the hemp plant, *Cannabis sativa*. Cannabis has for long been one of the paradoxes of pharmacology. Under a host of names, such as charas, hashish, bhang, ganja, marihuana, and Mary Jane, it is widely used as a drug of addiction, and there are many vivid descriptions of its action. Nevertheless, except for its use as a colouring agent in corn paints, it has never firmly established itself in human therapeutics; it has been removed from the *British Pharmacopoeia*, though it is still widely used in veterinary medicine. The reason for this lies in the inconstancy and frequent inactivity of the drug. Two recent reviews of the chemistry and the pharmacology of the hemp drugs by Todd[1] and Macdonald[2] give good cause for believing that these defects will soon be remedied. The Egyptian, Indian, and American hemp plants differ slightly from one another. Within each species there is a great variation in the content of active material. The active constituent is contained in the high-boiling portion of the resin, is nitrogen-free, and can be distilled in a high vacuum without decomposition. The earlier investigators made the mistake of believing that this portion was homogeneous, which is far from being the case. Moreover, they were handicapped by unsatisfactory methods of assay. It is now known that the reaction (called the Beam test) in which a red-violet colour appears with alcoholic potassium hydroxide is not given by the active constituents of the drug. Biological tests are therefore used: *Cannabis indica* produces in dogs a characteristic ataxia, and in cats there is also abolition of the corneal reflex. A number of chemical principles have been isolated from the resin. Cannin, the most recently discovered, shows the typical action of the drug in dogs. Cannabinol, cannabidiol, and its isomer cannabol are practically inert. These substances are cryptophenols, apparently derived from the condensation of a terpene and a resorcinol derivative. Synthetic tetrahydro cannabinols, of which a variety has now been produced, show hashish activity: it is more than likely that one of these will replace the crude drug in future therapeutics. The most important applications will probably lie in the field of mental illness. Macdonald describes *Cannabis indica* as the best drug for depressive mental conditions. Not even opium gives the same feeling of well-being, both physical and psychical, and opium is also inferior to hemp because of its tendency to addiction, its depressant action on respiration, its tendency to constipate, and the frequency of "hang-over" next day. Moreover, the power of hemp to revive old memories and recall in detail things long forgotten may be a powerful aid to psychotherapy. Difficulties may arise from the facts that there is great individual variation in susceptibility and that the response in the same individual may vary greatly at different times. Nevertheless we shall look forward with interest to the application in man of these important advances in the chemistry and pharmacology of *Cannabis indica*.

[1] *Nature*, 1940, 143, 829.
[2] Ibid., 1941, 147, 167.

FITNESS OF AIR PILOTS

It has long been recognized that only a small percentage, probably not more than 5, of air crashes are due to mechanical failure. It is not the aeroplane but its operation which is chiefly at fault. Ferree and Rand,[1] in a survey of the problem, stress the incongruity of maintaining an aeroplane in perfect condition and giving relatively little attention to the pilot. The fitness of the pilot is, of course, not a mechanical problem. There is, therefore, all the more reason for their recommendation that pilots should be frequently re-examined. The complexity of the problem makes it necessary to have tests of a number of different functions. The authors describe an instrument which should facilitate such tests. It should be possible with this instrument to gauge dynamic speed, capacity for night flying, reaction to changes in altitude, and susceptibility to ocular fatigue. The instrument is electrically operated, and it should be possible to carry out the examination in ten minutes. The problem is of importance; but Ferree and Rand appear to be speaking more of indifference to these questions in the United States than in this country, where the Medical Department of the Air Ministry has paid great attention to them from the time of its establishment. There is no reason to assume that the authorities here have either ignored or overlooked the fundamental difficulties stressed by the writers of this paper.

RHEUMATIC CEREBRAL DISEASE IN SCHIZOPHRENIA

There is something of the attitude of the defeatist in the willingness of many psychiatrists to accept the position that structural changes in the brains of schizophrenics cannot and never will be demonstrated. A paper describing a serious attempt to discover a structural basis for dementia praecox[2] therefore makes stimulating reading. Bruetsch found the post-mortem incidence of chronic rheumatic endocarditis in a series of cases of dementia praecox to be 9%. This is a high figure for a mental hospital population, as it does not include cases of acute rheumatism. The average incidence in general hospital populations, including acute cases, is considered to be well under 4%; and the incidence in a large American mental hospital (Indianapolis), including a high proportion of necropsies on cases of dementia praecox, was 5%. The basic fact, however, in Bruetsch's paper is not the apparent high incidence of chronic rheumatic endocard-

[1] *Brit. J. Ophthal.*, 1940, 24, 581.
[2] *Amer. J. Psychiat.*, 1940, 97, 276.

itis in schizophrenics, but the discovery that in all such cases there was diffuse rheumatic vascular disease of the small cerebral arteries. The histological evidence suggested that the infection was active and recurrent, and associated with the arterial lesions were areas of infarction and foci of neurogliosis. In all cases other possible factors such as cerebral arteriosclerosis and syphilis were absent. Bruetsch considers that the vascular and parenchymatous changes which he describes were as extensive as the cerebral damage seen in meningo-vascular syphilis and in cerebral arteriosclerosis accompanied by mental disease. He makes the claim that rheumatic cerebral vascular disease should be given a place in the aetiology of dementia praecox. This claim must be regarded seriously if it is accepted that dementia praecox, whilst being a clinical syndrome, is not an aetiological entity. Bruetsch discusses the relation of the cases to chorea. He notes that a history of chorea is always regarded on the basis of clinical experience as more than an incidental factor in the development of a psychosis, and suggests that if a rheumatic recrudescence involving the brain occurs in later years it may be that not chorea but mental symptoms will result. The paper records the results of a painstaking research and is well illustrated. The histological diagnostic criteria are based on the work of von Glahn and Pappenheimer,[1] Karsner and Bayless,[2] and Gross *et al.*[3] It is pointed out in conformity with the modern conception that rheumatic vascular disease may be widespread throughout the tissues, that lesions in the brain were first described by von Sántha in 1932.[4]

PITUITARY AND SENSITIVENESS TO INSULIN

For a number of years it has become increasingly clear that, although the majority of diabetics can be restored to a state approaching normal by appropriate diet and by injections of insulin, in a number of these the essential disorder is certainly not merely an inadequate production of their own insulin. Diabetics may be divided broadly into two groups according to their reactions to insulin. The first group—typically young diabetics prone to develop ketosis—is characterized by a response to insulin with a fall in blood sugar essentially similar to that of a normal person. It is possible that in this group failure of adequate secretion of insulin is the fundamental cause of their diabetes. In the second group a relative insensitivity to insulin is found, a dose of insulin causing little or no fall in blood sugar. To this group commonly belong the elderly diabetics in whom the disease runs a mild course with little tendency to ketosis. In members of this group insulin has not its normal power to facilitate the passage of sugar from the blood stream to the peripheral tissues. Some abnormality is apparently present which interferes with the action of insulin, and evidence gradually accumulates that this abnormality is in some way connected with the pituitary gland.

In many experimental animals a great increase in sensitivity to insulin results from removal of the pituitary gland. From the anterior lobe of the pituitary can be extracted Young's "glycotropic factor," and if this is injected into the hypophysectomized animals their sensitivity to insulin is much reduced. It seems, therefore, that in the normal animal the continued production of this factor prevents too great a fall in blood sugar after a dose of insulin. Injection of this glycotropic factor into normal animals leads, in a few hours, to a complete insensitivity to insulin, and yet the factor, when injected by itself, has no appreciable power to raise the blood sugar level. This glycotropic factor thus appears to act as a specific "anti-insulin," and as such is clearly likely to play an important part in the phenomena of diabetes, especially in that type which is relatively insensitive to insulin. Support for such a view was provided by de Wesselow and Griffiths,[1] who found that the serum of some diabetics, when injected into rabbits, diminished the animals' sensitivity to insulin in the same manner as does the glycotropic factor. Himsworth and Kerr[2] have recently been investigating the point. Having acquired experience in the detecting of glycotropic activity they applied this to a search for its presence in diabetic blood serum. Twenty-seven patients were examined, of whom twenty-two were of the insulin-insensitive type. In no case was any glycotropic activity found. They were, however, equally unable to demonstrate glycotropic activity in the serum of rabbits previously made insulin-insensitive by injection of the factor in large amounts. Their failure in the human subjects is therefore no proof that the glycotropic factor is not involved in this insulin-insensitivity. But the injected rabbits were found to excrete the glycotropic factor in their urine, and from this it could be concentrated by adsorption on benzoic acid. The urine of the human diabetics was then examined in the same manner, but this yielded no evidence of excretion of the glycotropic factor. The significance of this negative finding was greatly enhanced by the fact that the positive results were, in contrast, obtained with the urine of three cases of hyperpituitarism—one of acromegaly and two of Cushing's syndrome—which had sugar curves of diabetic type. But though no direct proof of the involvement of the glycotropic factor in insulin-insensitivity has thus been obtained, there nevertheless remains indirect evidence that some such mechanism exists. Himsworth[3] had shown that the sensitivity of a diabetic to insulin can be increased by a high carbohydrate diet or reduced by one low in carbohydrate. The same phenomenon can be observed in rabbits, and Himsworth and Scott[4] have demonstrated that this is dependent on an intact pituitary gland, since hypophysectomized rabbits, unlike normal ones, do not show reduced sensitivity to insulin when kept on a diet low in carbohydrate, whereas they do so if injected with the glycotropic extract of the pituitary. Thus although good evidence has been forthcoming that the pituitary is in some way responsible for some forms at least of insulin-insensitivity, the precise nature of its role still eludes clear demonstration. It is evident, however, that the discovery of insulin, important as it is from both theoretical and therapeutic standpoints, has still not revealed the actual cause of the diabetes it so effectively treats.

We record with pleasure that on April 24 Dr. G. C. Anderson, Secretary of the British Medical Association, and Dr. E. C. Morland, Editor of the *Lancet*, were elected Fellows of the Royal College of Physicians of London under By-law XXXIX (b), which enables the College to honour in this way those, not being Members, who have distinguished themselves in any branch of the science or practice of medicine.

We regret to announce the death of Mr. J. Hogarth Pringle, F.R.C.S., consulting surgeon to the Glasgow Royal Infirmary.

[1] *Amer. J. Path.*, 1926, **2**, 235.
[2] *Amer. Heart J.*, 1934, **9**, 557.
[3] *Amer. J. Path.*, 1935, **11**, 253.
[4] *Virchows Arch.*, 1932, **287**, 405.

[1] *Lancet*, 1936, **1**, 991.
[2] *Clin. Sci.*, 1940, **4**, 257.
[3] Ibid., 1935, **2**, 67.
[4] *J. Physiol.*, 1938, **91**, 447.

POST-WAR MEDICAL EDUCATION IN LONDON

WITH SPECIAL REFERENCE TO THE MUNICIPAL HOSPITALS

BY

SOMERVILLE HASTINGS, M.S., F.R.C.S.

The municipal hospitals of London have been so tucked away in back streets and obscure corners that few people realize that they contain in ordinary times thrice as many patients as the voluntary hospitals. It has long been felt that insufficient use has been made of the resources of these hospitals for teaching purposes. Accordingly it may not be without interest to state briefly what teaching has been done in them since the war began, and to make suggestions for their further use after the war. It is perhaps hardly necessary to point out that in anything I have to say I am expressing my own views only and in no way committing the London County Council, which is in control of the municipal hospitals of the County of London.

When I was a student we came in contact with the municipal hospitals in two directions only. On two afternoons a week for about two months we attended at one of the fever hospitals for lectures and demonstrations. We also occasionally visited a mental hospital for similar purposes. Most of us regarded these visits as pleasant interludes, but my chief recollection of them is in wondering what advantage was to be gained by the use of the much-soiled overalls at the fever hospital and how some of the apparently normal individuals at the mental hospital managed to find their way there.

To-day I learn that attendances have still to be made at fever and mental hospitals and that a good many students are no longer doing their midwifery "on the districts" as I did, but in municipal and other hospitals. From the medical point of view this is no doubt all to the good, but the sociological value of a month on "extern" must not be forgotten. In it the student, perhaps for the first time, comes into direct contact with poverty in all its nakedness and ugliness. Last summer before the "blitz" started each of twelve of the municipal hospitals of London was taking two to four medical students at a time from ten of the medical schools for midwifery training. In most cases the students attended the hospital for a fortnight only, but a good many remained three weeks or a month, and there is undoubtedly much to be said for this longer period of stay. With few exceptions the students lived in hospital, the Council making a charge of 30s. a week for board, lodging, and laundry. It is, in my opinion, important that the student should reside in hospital, as otherwise a good deal that is of interest and importance is certain to be missed. Since September last the number of confinements taking place in London has considerably decreased, and it has accordingly been found necessary to restrict the number of students in attendance.

Before the war a certain amount of undergraduate teaching was undertaken in L.C.C. hospitals, for the most part by teachers directly associated with the medical schools. On the declaration of war a large number of students were allocated to various municipal hospitals to act as casualty dressers under the Emergency Medical Scheme, and, although their services were not required to the extent that had been anticipated, many were glad to receive clinical instruction in the wards of these hospitals.

Clinical Teaching

The result of the war, so far as clinical teaching in the hospitals with medical schools is concerned, has been twofold: In the first place, the number of beds occupied by cases suitable for teaching has greatly decreased; secondly, the teaching staff have been dispersed and are in many cases either in the Services or working at hospitals remote from their medical schools. Accordingly a good many of the municipal hospitals of London were requested by those responsible for the medical schools to provide or increase their facilities for clinical teaching. Before the wanton destruction of hospitals began in September last, twenty-three municipal hospitals were receiving students from ten medical schools. In most hospitals medicine and surgery are taught, but where facilities are adequate gynaecology, pathology, and paediatrics are added, and in three anaesthetics and in one venereal diseases. The method of teaching varies. In some hospitals students act as clinical clerks in the wards; in others they attend daily or weekly rounds and demonstrations, or work in the operating theatres or receiving wards. In many instances they spend the morning in hospital and go to the medical schools for lectures or tuition in the afternoon. About half the students live in hospital: there is much to be said for this when accommodation is available, as so many emergencies have to be dealt with in the evening or at night.

The clinical teaching has in the past been undertaken (1) by the teaching staff of the medical school, who visit the Council hospital exclusively for this purpose; (2) by the consulting staff of the municipal hospital, who attend at regular times weekly (the position of these officers is slightly different from that of the consultant staff of a voluntary hospital, as they are not in charge of beds but for the most part act as true consultants: they give advice as to diagnosis or treatment of cases submitted to them, sometimes performing any operation required, sometimes the operation being done by the resident staff); and (3) by the staff of the municipal hospital, who are themselves responsible for the medical care of the cases used for teaching. In some hospitals one only of these three methods of teaching is adopted; in others two; and in three hospitals all methods are in use. Undoubtedly there is something to be said for each. The staff of the medical school should be experienced teachers and should know what their students require. On the other hand they are not in actual charge of the patients, and their position in the hospital is, to say the least, somewhat invidious. I do not think the point of view is often expressed, but I do know that some of the municipal hospital staff, who are themselves well qualified, keen on their work, and good teachers, do feel a little uncomfortable when someone from outside comes to give instruction on cases which they have carefully studied. The position of the consultant staff of the Council hospital is of course different, as they have in most cases seen the patients taught on in consultation with the resident staff, although they cannot be expected to know as much about them as those who see them every day. Other things being equal, therefore, I would suggest that the teaching is best carried out by the regular hospital staff.

And here it may be useful to inquire what is to be gained by the use of municipal hospital beds for teaching purposes. From the students' point of view it will be readily admitted that, since at least 50% of them will probably be entering general practice, an intimate knowledge of the ordinary affections, chronic as well as acute, is most essential. This is the very type of case which has to be admitted to the municipal hospitals, not so much because of medical interest or the need for special treatment, but because the patient cannot be looked after properly at home. Gastrectomies and oesophagectomies have to be undertaken, and the student may be fortunate enough to meet with two or three of each during the rest of his professional life; but it is patients with chronic bronchitis, rheumatism, and heart failure that will occupy most of his time.

Relations with the Student

From the point of view of the municipal hospital I would myself welcome the students whole-heartedly. There is nothing like teaching for consolidating one's knowledge and exposing one's ignorance, especially when the taught are keen critical young people at the zenith of their mental capacity. In my opinion the municipal hospitals have suffered in the past from too much isolation. It is good for all concerned to bring in people from outside, and not least perhaps for the nurses, who are usually glad to meet the students and have been known to

make lasting friendships with them. I have discussed the position of students with many medical superintendents and not a few resident physicians and surgeons, and, without one single exception, they have all told me they were glad to have them in hospital.

The relation between the municipal hospital and the student seems to vary a great deal. In some cases the student appears to drift in, take up residence, and remain for a varying time until he desires a change, without the smallest interest being taken by his medical school. In others the work is systematized. Until the East End hospitals were so much knocked about, seven were (and three still are) used by students of the London Hospital, where the policy of the Medical School is to retain its students during the first clinical year directly under the charge of its own hospital staff, and give them careful and detailed teaching on a relatively small number of selected cases: but during the second year, after instruction in pathology, fevers, mental disease, obstetrics and gynaecology, to send them to municipal hospitals, where the greatest variety of clinical experience can be found. Most of the students, I am informed, live in the hospitals to which they are attached. This is said to be very greatly to their educational advantage, for not only do they see emergency admissions during the night but they come to feel that they are part of the organization of the hospital, and in consequence profit and gain experience. During the last clinical year students are allocated to hospitals near the London Hospital or to the "London" itself. Many are living at the near-by municipal hospitals. Students at these hospitals are sufficiently near the "London" to come up several days a week in the afternoon to attend the systematic teaching intended for senior students which is still provided (and will be provided, I am told, as long as possible) at the London Hospital.

When allocating students to hospitals the Dean of the London Hospital Medical School endeavours to meet students' own wishes so far as possible in relation to the kind of work—i.e., medical or surgical—on which they ought to be engaged. On the other hand, the Medical School thinks it a mistake for any students to stay at one hospital for more than six months at a time. This organization is obviously an involved one, and means much travelling round to see how things are going on and a rather complicated change-over between hospitals at the end of each calendar quarter. It has, however, I am informed, worked satisfactorily and is fluid enough to be adjustable at short notice to meet any new situation which may arise.

Problems of the Future

So much for medical education in London to-day. But is it all that it should be? Is the best possible being done under the changed conditions consequent upon the war? In the London Hospital there were 850 beds available for clinical teaching before the war. In Sectors I and II there are now over 10,000 for acute cases, and the London Hospital Medical School is making good use of these. In some of the sectors there are many fewer beds, but I am not quite sure that all are being used to the fullest advantage for teaching purposes. Moreover, why must a medical school confine its students to the hospitals of its own sector? Surely teaching may be of value though it is not given exclusively by the staff of the particular hospital to which a student is attached.

Further, what will happen after the war? Shall we return to the system by which, with the exception of fevers, mental disease, and in some cases midwifery, the whole of a student's education takes place within the walls of a single hospital? Is there not a good deal to be said for three or six months being spent at a hospital in which ordinary everyday cases of general practice can be better studied? And if this be the case, at what stage should this resident appointment be fitted in? I know there are innumerable problems and difficulties—the already overburdened curriculum, the payment of the teachers, the time taken in teaching in relation to their other duties, etc. But all these are not insoluble, and the efficient training of doctors for the difficult years ahead is more important than them all.

Nova et Vetera

SEVENTY-FIFTH ANNIVERSARY OF THE "INDIAN MEDICAL GAZETTE"

The *Indian Medical Gazette* in its issue for December last published a brief history of the past three-quarters of a century to celebrate its seventy-fifth year of issue, about a quarter of a century less than our own *British Medical Journal*. It begins with a brief account of the advance in medical science made during that time, which includes practically all the modern developments, except vaccination, which was somewhat earlier, and goes on to an account of the growth and development of the *Gazette* itself.

During the past century dozens of medical journals have sprung up in India and had their brief day, usually petering out after a few years and now forgotten. The most successful of these was the *Indian Annals of Medical Science*, which started some ten years before the *Indian Medical Gazette* and lasted for about twenty years. But it was never exactly a newspaper; it was much more like a monthly magazine than a journal. There are a number of medical journals of sorts now running in India, some of which may perhaps last. About 1882 the late C. W. S. Deakin, I.M.S., started at his own cost and responsibility a periodical which began as the *Transactions of the N.W.P. Branch of the British Medical Association* and developed into the *Indian Medical Journal*. It ran for some ten years, but ceased to appear after Deakin's death. Dr. Wallace, a retired member of the Indian Medical Department, started a journal, the *Indian Medical Record*, in 1890, which began as a monthly, after three years became a fortnightly, and in 1899 a weekly journal. It ceased with Wallace's death in 1903, but was more than once revived for a time. In 1884 the Government of India began the publication of *Scientific Memoirs*, which came out at irregular intervals, usually roughly monthly. But this has never been in any sense a medical journal, but an issue of highly technical papers.

At the end of the article comes a list of editors, from 1866 to the present day. To two of these editors, who held office for a long time, the success of the *Indian Medical Gazette* is chiefly due: the late Brigade Surgeon Kenneth McLeod, editor 1871 to 1892, and the late Lieut.-Colonel Sir Walter Buchanan, editor 1899 to 1918—especially to the latter, who practically remade the *Gazette* and greatly increased its circulation.

THE HEFFERNANS

Major Patrick Heffernan has put his leisure to good purpose after his retirement from the Indian Medical Service. He has published a concise and well-written history of the Heffernan family.[1] It will be read with interest by many different classes of readers. The Heffernans occupied from time immemorial the tract of country lying between Tipperary and Limerick. They appear in history as large farmers, often above the average in culture, and filling many positions at home and abroad, beginning from very early times. Major Heffernan carries the story down to the present day. The most interesting chapter perhaps is that dealing with the clan system. He suggests that the derelict conditions so common in the south of Ireland are due less to the famine years in the middle of the last century than to the absence of the custom of primogeniture. A father could and did leave his possessions to any of his children; it might thus happen that no one had more than a life interest in the lands and houses, which were thus allowed to fall into disrepair. The theory is plausible and requires more thorough examination. Major Heffernan's book should appeal to medical men because so many of his family have been doctors, especially in the Indian and Army Medical Services.

[1] *The Heffernans and Their Times. A Study in Irish History.* By Patrick Heffernan, M.D., Major, I.M.S. (ret.). (Pp. 200. 10s. 6d.) London: James Clarke and Co., Ltd. 1941.

Reports of Societies

THE EFFORT SYNDROME: ITS NATURE AND TREATMENT

At a meeting of the Section of Medicine of the Royal Society of Medicine on April 22, Sir MAURICE CASSIDY presiding, the subject of discussion was "The Effort Syndrome."

Dr. H. J. STARLING gave a historical review of the subject since 1864, at which time a committee considered it. It was then defined as "an extreme sensibility of the heart, with some but not great enlargement, and on the least exertion the action becomes irregular and the man becomes breathless." In spite of various publications on the "soldier's heart," few realized what it was and how to deal with it until the war of 1914–18. It was Sir Thomas Lewis who first described the condition as "effort syndrome" and instituted the only way by which it could be alleviated or cured.

With few, if any, exceptions, effort syndrome was primarily a civilian complaint. At least 50%—perhaps 70%—of the civilian population, when taken from their peaceful routine of life, were liable to this disorder, though they managed to do their daily work in their particular niche. At Colchester (1917–19) there were, however, a few outstanding men who at first glance looked different from the majority, and as though they ought not to be there at all. They had no tremor, but simply dyspnoea and tachycardia on effort. Almost invariably these were found to have some organic heart lesion, yet they had not been subjected to more strain in the Army than in civil life. In these cases it was not the physical but the psychical distress which produced the effort syndrome, and in most cases with the return to civil life it disappeared.

Since June, 1939, he had been engaged on this problem at the other end—namely, as chairman of the medical boards in a provincial city, where about 300 men per week were passed in various grades into the Service. He had been struck by the immense physical improvement of the men of 18 to 26, and their keenness on enlistment, whether as volunteers or under the Act, and it would be interesting to know whether this type afterwards yielded any considerable proportion of effort syndrome cases. The real national problem was not so much the cure or alleviation of the cases which arose as a result of the war, but the means whereby they might be prevented before war began. Convinced as he was that the disabilities were inherent in the civil population, he felt that the population must be trained in times of peace. The worst type of effort syndrome was found in the lad who was diffident and solitary, often spoiled by an indulgent mother, and much subject to minor infections.

The Emotional Factor

Dr. PAUL WOOD said that a review of English and American literature for the past eighty years, actual contact with some 300 patients, and certain researches had led him to some conclusions about this subject which would be published elsewhere. Here he would only indicate the general line of the argument. The incidence of symptoms in effort syndrome was, first, breathlessness in 93% of cases, palpitations in 89, fatigue or weakness in 88, sweating in 80, nervousness in 79, dizziness in 78, pain in 78, and other symptoms in lower percentages.

The symptoms and signs more closely resembled those of emotion, especially fear, in the normal person, than those of effort or heart disease. Researches into the behaviour of the pulse rate, sweating, breathlessness, and fatigue led to the conclusion that somatic manifestations were due to central stimulation, not to hypersensitivity of the peripheral mechanism. Direct evidence that this central stimulation was emotional was available. He drew special attention to the distribution of sweat in what he preferred to call Da Costa's syndrome. The palms of the hands, the axilla, and to some extent the brow were the usual sites. Such a distribution necessitated an emotional stimulus. On the other hand, if a cholagogic drug were administered, such as acetyl-beta-methylcholine, the distribution of the sweat followed the parasympathetic flush area, and left the extremities more or less free. When an experiment was carried out with this drug the controls sweated more than the patients. How these emotional reactions became linked up to effort was perhaps the crux of the situation. He urged that the diagnosis "effort syndrome" be dropped. A proper psychiatric diagnosis was nearly always available; if attention must be called to the presence of effort intolerance, let "effort intolerance" be added, preferably in brackets. If it was convenient at times to speak of all these cases under a group heading, why not "Da Costa's syndrome"?

Finally, he mentioned researches into left inframammary pain. This pain was not imaginary. No imaginary pain could be so consistent in its characteristics. It seemed to be muscular or ligamentous and related to respiration and to the fact that the heart was beating hard in its irritable fashion against the chest wall. In 25% of the cases the pain was bilateral, but the patients took no notice of the pain in the right mammary region, concentrating on the pain in the left and imagining it referable to the heart.

A Heterogeneous Condition

Dr. AUBREY LEWIS said that "effort syndrome" was a heterogeneous, not a unitary, condition, and therefore it did not deserve a unitary name. A uniform plan of treatment for all cases of effort syndrome would be neither ideal nor efficacious. Probably no one would argue that physical training and graduated exercises were the whole of treatment and not a part, but the emphasis given to them was exaggerated. Perhaps they were more useful diagnostically and prognostically than therapeutically. Sir Thomas Lewis and others had drawn special attention to the large proportion of these patients seen in the last war who had previously followed a sedentary occupation. The more carefully the symptoms were studied the more evident it became that this was not a local disability but a general disorder, influenced by local factors. Both physical and psychological disturbances were at work. Some of the patients were highly suggestible. Any subjective symptoms such as pain, discomfort, weakness, or fatigue would be influenced by the attitude adopted by those who inquired about the symptoms. The symptoms might be intensified or disposed of by the doctor, sometimes without his awareness of the influence he was having on the patient. There were almost always in the man's past both physical and psychological influences strongly represented in his constitution, which had so conditioned him that in the face of the rigors of war he developed symptoms of effort syndrome and tended to utilize them to escape from an environment which did not suit him.

There were only two things the doctor could do: he could either alter the man fairly radically or alter the conditions under which he served, and both these were difficult. To alter a man physically and psychologically so that he would put up with what he could not stand before was only occasionally possible, and alteration of environment was hampered by the necessary rigidity of military arrangements. The returns for a number of men whose history was inquired into six months or more after discharge from hospital to military duty showed that 30% were doing full duty efficiently and willingly, 36% had been discharged from the Army, and the remainder were doing light duty or were doing full duty not quite satisfactorily or had fallen ill again. The conditions to which the men returned would often decide whether they succeeded as soldiers or not, and some commanding officers were more adept than others in fitting these men in. Between one-half and three-fourths of the patients could have been got back to military duty of a type for which they were fitted, but this would have required a sorting of the men and an amount of military administrative procedure which were perhaps hardly practicable. There was very little evidence that these men as a group were physically inferior, and often it was found that in civilian life they had been doing work as heavy as or heavier than they were called upon to do in the Army. A relatively small physical disability was seized upon for emotional purposes and magnified. He added that the problem of effort syndrome bore the hallmark of a psychiatric problem—that is to say, it was an individual and at the same time a social problem, and must be dealt with on both individual and social lines.

Dr. MAXWELL JONES said that breathlessness was one of the main complaints in effort syndrome. It might come on at rest or on excitement, but according to the patients' statements it was more usually related to physical effort. The first point to inquire into was whether hyperpnoea in excess of normal was present after effort, and, if so, whether it could be estimated. He described a respiratory exercise tolerance test which he and his colleagues had devised to show any deviation from normal respiration. It was tried out with 32 patients and an equal number of controls, and the results showed that in fairly severe cases of effort syndrome there was a delay in the return of the volume to the resting level as compared with a group of normal subjects. There were also characteristic differences in respiratory style, vital capacity, and breath-holding in the cases of effort syndrome.

General Discussion

Colonel H. L. TIDY said that in the last war this condition, then known as "D.A.H.," became an extremely important matter; the element of fear was largely regarded as the causative factor. At present effort syndrome in this war was a relatively trivial concern. He believed that in this country only 200 beds were allotted to cases of effort syndrome, these relating to all the Services, and the beds were not all occupied. He thought that Army medical officers should not be encouraged to send cases of effort syndrome to specialists. Many officers had succeeded in getting the men through without sending them either for examination by a specialist or into hospital, and there was no doubt that a number of men were able to be acclimatized and to become useful soldiers, whereas if sent to hospital they would drift into the class of effort syndrome cases. In Sir Thomas Lewis's cases 50% were sent back to the front line, but it was not known what happened to them subsequently; no doubt some went again into hospital. It was an undoubted fact that a large number of these men were below the physical average, and their condition was not improved to any great extent in hospital.

Sir MAURICE CASSIDY said that he did not suppose many of those present ever saw these so-called "effort syndrome" cases in the last war before they went to Colchester. In 1915 and 1916 large numbers of men were to be seen who had been kept in bed for months with a persistent tachycardia—rates of 120 or even more. They reminded him of a second-hand car which he bought at that time. On asking his chauffeur what he thought of the brakes, he replied, "Well, sir, with this kind of brakes, the harder you press them the faster she goes!"

Sir ADOLPHE ABRAHAMS said that he, too, deprecated the term "effort syndrome," but he could not substitute anything more satisfactory, and its predecessors "D.A.H." and "soldier's heart" were very much worse because they concentrated attention on the heart, and the second of them suggested an occupational disorder. The term "effort syndrome" would be more acceptable if it were quantitative, as some people had the impression that it was—in other words, that a minimal effort in these subjects produced the same train of symptoms as were produced in anyone if the exercise was sufficiently severe. But the symptoms which occurred in these people had nothing to do with effort, and the large majority of them could never be produced by effort, however severe, in a normal subject. Even breathlessness in a physiological sense was a different phenomenon from what was seen in these cases. On occasion one might see a great athlete tremulous, sweating, shivering, and completely incapable of any physical effort; but that had nothing to do with effort, it was simply the prospect of an ordeal, and the same train of symptoms might be produced in a person who was about to make a speech or enter for an examination. A number of different things had all been lumped together because they had the same symptomatology and to a certain extent the same physical signs. But gradually order was coming out of this chaos. The workers were isolating certain groups which could be explained. It was true that there was a baffling residue, whose incapacity for exertion, symptomatology, and physical signs were not explicable. He always had the hope that if they were explicable a great deal of normal physiology would be learned from them.

Major GERALD SLOT said that cases he had seen were not always in the new recruits; they were often men who had been in the Army since the beginning of the war, and a good many of them seemed to date their trouble from Dunkirk. On going back a little into their history it was sometimes found that they were temperamental, emotional, and unlikely to stand up to stress and strain. It was idle to send these people back to their units; they would only be sent somewhere else within a short time. Hospital treatment did not seem to be successful. They got better in hospital, but the condition recurred after discharge. It was well to be on the look-out for thyrotoxicosis in cases bearing this label, and also to be aware of the possibility of early tuberculosis. As for left inframammary pain, he had been able in many such cases to elicit a history of fibrositis.

Major C. HEWITT ATKINSON said that he did not think it was sufficiently explained to these patients that anyone undergoing mental or emotional strain also went through a physical effort. The patient was puzzled by his palpitations, and a proper explanation of the symptoms helped towards reassurance and recovery. "Effort syndrome" was a wide term. He was accustomed to think of these cases in three groups. The first consisted of the true effort syndrome case, in which the patient had been through a severe ordeal and showed signs of cardiac strain. The second consisted of those who came up primarily anxious about their heart (the characteristic individual was the over-strained student). The third class consisted of those in which infection was present.

Major GEOFFREY KONSTAM said that if any progress was to be made certain definite limits must be laid down. He would eliminate cases of pure anxiety neurosis without particular symptoms of effort and also the pure cardiac neurosis. Dr. Paul Wood had exhibited to the meeting a painting of a patient at Mill Hill illustrating what he considered to be the typical constitutional case—the strained features, the slumping posture, the flat chest. In Major Konstam's view the rather placid face in this portrait did not illustrate the condition. In the typical case he had been struck by the corrugations on the forehead, both horizontal and vertical.

Dr. STARLING, in reply, taking up Dr. Paul Wood's suggestion that the term "Da Costa's syndrome" might be used, hoped that no more syndromes or diseases would be described by a person's name.

DEATH AFTER DELIVERY

At a meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland on March 14, the chair was taken by the president, Dr. R. M. CORBET, and Dr. J. G. GALLAGHER read a review of some of the causes of maternal death shortly after delivery.

Nearly all his cases came under the heading of "obstetric shock"; they had occurred in the Dublin maternity hospitals during the last five years. Among 52,000 deliveries there had been 248 deaths, 74 being due to haemorrhage and shock. A search for a common factor had shown that 30 deaths had followed manual removal of retained placenta, that ante-partum haemorrhage had been a factor in 25 cases, and that anaemia had been the main factor in 6 deaths and important in 8 others. The remedy for anaemia was more widespread ante-natal care and better all-round nutrition. Many of the patients with ante-partum haemorrhage had been received in a dying condition; both transfusion and section had had a fair trial. Placenta praevia had caused death from bleeding in 8 cases. Twelve patients had died of shock from abruptio placentae, and there had been 5 fatal cases of external accidental bleeding. The mortality of manual removal of the retained placenta was 11 to 15%. Death was apparently due to shock in 25 cases, in 18 of which there had been no post-partum haemorrhage and a normal second stage. Five deaths had been due to sepsis. The real danger of operation was shock. Plasma transfusion might improve the results. Crede expression and intracordal saline had been associated with 2 deaths each. In addition to these three groups there had been post-partum bleeding in 22 of the cases, severe in 6; 7 cases of ruptured uterus, one of acute inversion; 6 of craniotomy, 9 of version, 7 of section operation, and 1 breech

extraction. There had been 19 forceps cases, in 5 of which the forceps had failed to deliver.

Dr. BETHEL SOLOMONS said that with very few exceptions the term "obstetric shock" would not be used to describe the cause of death; it meant that the obstetrician did not know why the patient died. To ascribe death to obstetric shock in cases of ruptured uterus, concealed haemorrhage, and failed forceps would be to prevent research which might lower mortality. Manual removal of the placenta was a disease of the junior obstetrician. A really adherent placenta rarely occurred at the first birth. Conservative measures gave much better results than Caesarean section in concealed accidental haemorrhage. He hoped that the injection of submammary saline was still taught for district work; pituitary shock would not occur if the extract were given after the placenta was delivered.

Dr. T. M. HEALY agreed that obstetric shock was a rare condition; he thought that many of Dr. Gallagher's fatalities were due to traumatic shock. It was exceedingly difficult to know what some of these patients died from; it would be a great comfort to obstetricians to know why, when patients bled into their tissues or into the peritoneal cavity, they got into such an extraordinary state of collapse after such small loss of blood.

Dr. O'DONEL BROWNE felt very strongly that the term should not be abandoned, and stressed the necessity for sharp distinction between it and the collapse or shock of excessive bleeding. He thought that Dr. Gallagher's summary indicated, as significant aetiological factors, ill-health before the confinement, prolonged labour, misapplied obstetric operations and bad obstetrical judgment, exposure to cold, and prolonged anaesthesia, but these factors would not of themselves precipitate the condition without concurrent tissue damage. He thought that pituitary shock was overestimated, and that judicious use of pituitary extract was a great asset in the treatment of shock. He had never known a case of traumatic post-partum haemorrhage where bleeding from a torn cervix demanded suture, and wondered whether the cases treated by cervical suture were not really incomplete uterine ruptures. Dr. A. SPAIN said that the mistake was to use the term "obstetric" in this condition; most of the patients had died from a shock which was in no way different from shock due to other conditions. Shock was a very definite clinical entity. In most cases manual removal of the placenta should be done earlier than it was. Dr. F. W. DOYLE believed that obstetric shock undoubtedly did occur, and described a case. He thought collapse and shock were two different conditions with many features in common. Dr. E. A. KEELAN said there must be a small group in which maternal mortality had its inception in the first stage of labour—for example, primiparae who did not obtain adequate rest, sleep, or food in the first stage, whose improper feeding produced vomiting, often persistent, or who were told to bear down too early. The result was maternal distress and premature termination of the second stage. Dr. D. F. HANLEY noted that all Dr. Gallagher's patients had been wounded in some way. The shock complex seemed to be secondary to some kind of trauma.

The PRESIDENT said that the records of the Coombe Hospital for the last five years suggested that patients who died shortly after delivery could be grouped into three classes: those with organic disease (9 cases), those with grave abnormality of pregnancy (8 cases), and those who had no complications before the onset of labour (1 ruptured uterus, 1 pulmonary embolus, and 4 cases of obstetric shock). He would reserve the term "obstetric shock" for those cases which had an atraumatic delivery without post-partum haemorrhage. He had long disbelieved in its existence, but had been forced to accept it. The consulting obstetrician was called to a patient in a terminal condition which might have resulted from either shock or haemorrhage, and had the grave difficulty of diagnosing between them. Manual removal was not associated with any mortality if undertaken for post-partum haemorrhage due to partial detachment of the placenta. It had a high mortality in patients who had developed shock without any adequate haemorrhage, but he was not satisfied that the mortality would be reduced by leaving the placenta in a patient whose shock was becoming progressively worse.

Dr GALLAGHER, in reply, said that submammary saline was slow and much more unpleasant for the patient than subcutaneous saline. He thought it would be difficult to find a short term to replace "obstetric shock."

Local News

ENGLAND AND WALES

Healthy London

The health record of London for 1939, the year in which a city devoted to the arts and services of peace switched over to a war footing, was remarkably good. This is the conclusion to be drawn from the very attenuated interim report for that year of the County Medical Officer of Health and School Medical Officer (Dr. W. A. Daley).[1] Infant mortality stood at the lowest figure ever reached—47 per 1,000 live births. Infectious diseases were all at the ebb, except for a trifling increase in the notifications of encephalitis lethargica and a rather considerable increase in the number of deaths from influenza. The number of notifications of diphtheria was down by more than one-half and those of scarlet fever by nearly one-third as compared with the year before. The number of deaths from pulmonary tuberculosis was virtually unaltered, but the primary notifications were lower. On the registers of London boroughs the number of cases of pulmonary tuberculosis stood at 23,000, and those of other forms at 6,700. An immediate effect of the war was a dislocation of the tuberculosis dispensary service and also the discharge of 1,750 patients from residential institutions in order that beds might be reserved for Service or civilian casualties. There was also a decline during this year in both notifications of and deaths from puerperal fever and pyrexia, this in spite of the fact that the number of beds available for maternity patients in London hospitals was materially reduced so that an increased proportion of confinements took place at home, many of them attended by the council's domiciliary midwives, who now number more than 100. Many important schemes of improvement and development in the county hospitals of London had to be abandoned on account of the war. All the patients in the general hospitals for acute cases who were reasonably fit for discharge, 4,000 in number, were sent home; others were transferred to hospitals outside the county boundary; and there remained 4,000 who could not be moved, while 7,600 beds were made available for air-raid casualties. But the expected air raids did not occur, and some acute sick were readmitted. The number of patients urgently requiring treatment who were admitted to the general hospitals during the last three months of 1939 was 29,500, or three-fourths of the number admitted during the corresponding period of 1938. The number of sick admitted to the special hospitals fell from 53,000 to 32,000 for the whole year. This includes the infectious diseases hospitals, where the number fell from 40,000 in 1938 to 21,500 in the following year. The reason for this is, of course, the decline in the child population of London under the Government evacuation scheme, but the low incidence of infectious diseases among the remaining population had something to do with it. The most complete dislocation occurred in the school medical service. With all the schools in London closed, and the school population, normally 435,000, reduced to 180,000, there was at first an entire eclipse of school medical work. But by November many of the school treatment centres were reopened, and by the end of the year nearly one-half the eighty minor ailments centres were functioning. While there was still no regular schooling the school medical service was in active operation. During the first two terms of 1939 over a quarter of a million children were medically inspected, nutrition was pronounced satisfactory in over 93%, and general health was good, showing in nearly every particular a slight improvement over previous findings.

Grants by the Nuffield Provincial Hospitals Trust

The trustees of the Nuffield Provincial Hospitals Trust have made a number of grants for hospital and ancillary medical services. They have authorized a substantial grant to the

[1] London County Council. *Interim Report of County Medical Officer of Health and School Medical Officer for 1939.* Westminster: P. S. King and Son, Ltd. (6d.; post free, 7d.)

Birmingham Accident Hospital as a practical expression of their desire to promote the establishment of efficient fracture services. The grant is made on the condition that the balance of the initial capital expenditure necessary to convert the old Queen's Hospital into the new Accident Treatment Centre is forthcoming from other sources. They are also making a contribution towards the capital cost of an Accident Treatment Centre in Oxford, proposals for which have been approved by the Berks, Bucks, and Oxon Regional Hospitals Council. Proposals have been prepared by the Medical Advisory Council of the Trust for a regional pathological service to provide complete, co-ordinated, and effective laboratory services for both public health and clinical pathology. The trustees have authorized a grant of £1,500 to the Regional Hospitals Council of the Berks, Bucks, and Oxon area towards the capital expenditure of the service. It is considered that valuable experience may be gained from this which will furnish a guide for future action in other regions. Financial provision is also being made by the Trust for a cancer survey to be undertaken in two regions. The trustees consider that the success of the scheme for the regionalization of hospital and medical services depends, to a large extent, upon the active, intelligent, and sustained co-operation of the general practitioner. It has accordingly been decided to adopt a scheme, experimentally in the first instance, in the area of the Oxford and District Joint Hospitals Board, for a medical liaison service. Under this scheme one or more retired medical practitioners will be appointed to act as liaison officers between the joint board and the general practitioners in the division. The cost of the scheme for the ensuing year will be defrayed by the Trust. A grant of £2,000 per annum for three years has been made to the Prince of Wales's Hospital, Plymouth, for allocation through the South-Western Regional Hospitals Council, subject to a satisfactory arrangement being made between the hospital and the Corporation on the co-ordination of hospital services in Plymouth and to an agreement between the Plymouth Corporation and the Devon and Cornwall County Councils as to the payment of contributions to the Prince of Wales's Hospital. A grant of £2,000 has also been made to the Royal Berkshire Hospital for the current year, and a further grant of £1,000 for a second year, subject to certain conditions.

Hospital Regionalization Conference in Liverpool

A conference has lately been held at Liverpool on the invitation of the Vice-Chancellor of the University (Dr. A. D. McNair) to discuss proposals from the Nuffield Provincial Hospitals Trust for a regionalized hospital service in the north-west. It was attended by representatives of the Trust, the Liverpool Hospitals Joint Advisory Committee, and the local authorities and voluntary hospitals of Lancashire and Cheshire, North Wales, and Westmorland and Cumberland. The Vice-Chancellor stated that some months ago the Trust approached the Advisory Committee, which represented both the municipal and the voluntary hospitals of Liverpool, asking whether the necessary steps might not be taken to form a hospital region based on Liverpool and its university medical school. The committee examined the proposals and decided to give effect to the request, with the result that the conference was called, not to accept a cut-and-dried scheme, but to consider the principle of regionalization as applied to the area. Addresses were given by Mr. W. M. Goodenough, chairman of the Trust, Sir Farquhar Buzzard, chairman of its Medical Advisory Committee, and Mr. S. Richardson, chairman of its Provincial Hospitals Regional Committee, and the conference was then thrown open. While the principle of regionalization was generally supported as a means of better co-ordination between voluntary hospitals and local authorities, it was felt that those present had no mandate to vote, and on the motion of Prof. Henry Cohen it was agreed, while expressing the desire of the conference to examine sympathetically the principle of regionalization, to adjourn to a later date so that the representatives of local authorities and voluntary hospitals might consult their constituents and obtain such a mandate. The chairman of the Birkenhead Health Committee, Councillor H. Bullock, said the lack of co-operation hitherto was due largely to the attitude of the voluntary hospitals, and he asked whether those hospitals would still be allowed a preferential position in regard to training, nursing staffs, and patients, and whether redundant hospitals would be scrapped. Sir Farquhar Buzzard replied that such questions could only be decided by the regional councils themselves. There was no desire to aggregate all consultants in one place, but rather to distribute them wherever needed.

SCOTLAND

Glasgow and the E.M.S. Hospitals

At the annual general meeting of Glasgow Royal Infirmary, at which the Lord Provost, Sir Patrick Dollan, presided, Sir William Marshall, referring to recent speeches of the Minister of Labour concerning the man-power of the country, said he could not help thinking of the incapacity through illness which prevented a large section of the people from doing their best in the national effort. It was stated that in this country on any day throughout the year 650,000 of the working population were away from work on account of unfitness. He believed that much of this incapacity need not exist if the medical and surgical services were immediately available for efficient treatment. A great army of workers might be pulling their full weight were it not for the fact that they could not obtain the treatment their medical advisers considered necessary for the restoration of capacity. Some of the emergency hospitals had very few or no patients. If there had only been some loosening of the restrictions regarding empty beds in emergency hospitals a large number of civilian patients would have been made fit for their work to-day. Sir William Marshall welcomed, as did Mr. Charles Glen, chairman of the Glasgow Royal Infirmary, the steps taken by the Department of Health to have waiting patients received in the emergency hospitals.

Bequest to Edinburgh for Medical Research

By a judgment in the First Division of the Court of Session, Edinburgh University becomes entitled to the whole residue of the estate of the late Mr. John Risk, a distiller of Stirling, to be applied for the advancement of medical and surgical research. By his trust disposition Mr. Risk directed that in certain events his trustees should pay one-half of the residue of his estate to the surviving issue, if any, of his daughter, or, in the event of there being no such issue, the whole residue to the Court of the University for this purpose. He also declared that should his daughter repudiate the settlement and claim her legal rights she and her issue should forfeit all rights under the settlement. Miss Risk did in fact claim her legal rights. It was agreed between the parties that the trustees were entitled to divide the estate remaining in their hands into two equal parts and to pay one of such parts to the University, but with regard to the other it was contended on behalf of Miss Risk that the trustees were not entitled to pay it away so long as it remained uncertain whether or not she would be survived by issue. The Division held that the University Court was entitled to payment of this second part of the residue.

Edinburgh Medical Missionary Society

The Edinburgh Medical Missionary Society will celebrate its centenary on St. Andrew's Day this year. Beginning in a small way its work and fame grew, and it has been the means of helping well over 300 medical students to train as doctors for the mission field under different religious denominations. It has also maintained hospitals in Nazareth and Damascus. To commemorate the first hundred years Dr. H. F. Lechere Taylor, a former secretary and superintendent, has written an outline of the history and activities of the society under the title *A Century of Service*. During the earlier years it was known as the "Edinburgh Association for Sending Medical Aid to Foreign Countries"; the present title was adopted in 1843. In 1861 the society took over the Cowgate Dispensary in Edinburgh. Extensions of the premises have included the Livingstone Memorial Medical Missionary Training Institution. It was in 1853 that the society sent its own first medical missionary to India.

Correspondence

"Bureaucratic Surgery"

SIR,—Mr. Norman Lake's letter has anticipated two short papers that I had in preparation—one on the treatment of scalp wounds, the other on the part that neurosurgery is playing in the present war. These might have forestalled some of his criticisms. I doubt whether Mr. Lake really objects to organization, though he clearly resents some of its results.

In brief, the reasons for the segregation of neurosurgical cases were twofold: first, the belief that they would be more competently treated and more fully investigated with regard to their present and possible future pensionable disabilities if they were in the hands of those who spent their lives at the work; second, the furtherance of research.

Once it had been decided to open these Centres the next question was, What types of injury were to go into them? This is, as Mr. Lake admits, a difficult one. Yet it was fundamental and it had to be answered. The only safe way was to ask that all head injuries, both slight and severe, should be sent. And in order to get a cross-section on the casualties notification of head injuries was set up. This was an excellent arrangement, for how otherwise was it to be learned what the incidence of the injuries was, what were their types, how many required operation, what was their mortality?

Experience was showing that even the scalp wounds were not being treated as well as they might have been. The simple scalp wound, about which one can in theory become so irate, is an abstraction. These wounds when inflicted under war conditions have commonly been produced by a force much more severe than those of peacetime, and complications are more common. I drew attention to this fact in a special paper in 1919. In the present war cases came into the Centres with missiles in their brains and with their wounds unexcised and septic. It is no use objecting that these were not scalp wounds; they were taken for such and treated as such in the receiving hospitals until the error was perceived. I have no doubt that Mr. Lake and others of his standing and skill would not, and do not, make these mistakes. But the fact of importance is that some persons do so. How, I ask, would Mr. Lake have solved these difficulties, not in the light of theory but with actual experience before his eyes? I would remind him that his ruling would have to cover not only the London teaching schools, the great schools of the Provinces, but also the large towns, the small towns, the cottage hospitals. No one can pretend that experience and ability are evenly distributed throughout the countryside, yet a ruling has to be made for all. I have always been aware that the order contains in it a germ of the ridiculous, but it was felt that the rule would be applied with common sense, and the trivial bumps and scratches would not be sent in. Mr. Lake can rest assured that this is so. It is clear that many surgeons feel some resentment, even an affront to their reputations, at what they call their "cases being taken from them." This is a sentiment shared alike by the less expert as well as by the good surgeon. How can a clear, workable, but not invidious, ruling be made, how precisely can exemptions be given, and to whom? And what will be the effect of these when it becomes known that So-and-so has been given permission to be the complete individualist and specialist in this or that or even to be a multi-specialist when So-and-so has not? What is more, the dispersal of cases into many hands makes co-ordinated research well-nigh impossible. This brings me to the other reason for the Centres beyond that of pure organization for practical purposes. The only way to further research, for which the present times offer unique and, we trust, non-recurring opportunities—for example, on the effects of the new antiseptics on brain wounds and meningitis as well as on neurological problems generally, such as the cortical electro-potentials after injury—was to collect the cases together. Several of these Centres are doing research of some kind or another with help from the M.R.C., and in order to obtain an unselected material for study both the slight as well as the obviously severe injuries must be gathered together. This was the reason for the setting up of the few peripheral nerve centres of which Mr. Lake also complains. It would have been a disaster if the Ministry had paid no heed to such projects because of the possible future objections of the few. Nor could the Medical Research Council have given its valuable help economically if the work had gone on in a plurality of places.

I believe that some of Mr. Lake's objections might have disappeared, or been less bitterly expressed, had he known what the ideas were behind the shortly worded and, I admit, not very explanatory requests that have doubtless come his way.

The wider issue as to what the future holds in the way of State medicine must be left. But I imagine and hope that the patient will be entirely free in his choice of doctor or surgeon. The war casualty is not in a position to choose; and the surgeon looking after him is, in regard to that patient, without vested interest or possession.

The exigencies of wartime have severely limited opportunities for discussion between ourselves in the ordinary way, hence misunderstandings. But it would be too much to hope that any arrangement could be arrived at, by any means whatever even in peacetime, that would find no critics, no dissenters.—I am, etc.,

Manchester, April 21. GEOFFREY JEFFERSON.

SIR,—In his letter Mr. Norman Lake echoes the sentiments of all his colleagues when he expresses his desire to see the Emergency Medical Service as perfect as possible from the patient's point of view. Yet if we will the end we must be ready to adopt the necessary means, and, as one who is quite as critical of the bureaucrat as Mr. Lake can be, I venture to submit to him that we must judge any therapeutic instruction or recommendation upon its merits, and that we may not dismiss it as a piece of medical bureaucracy simply because we distrust the channel through which it reaches us. Here at least is an opportunity for the use of that sound judgment which Mr. Lake—bolder than I—claims by implication for all senior members of voluntary hospital staffs.

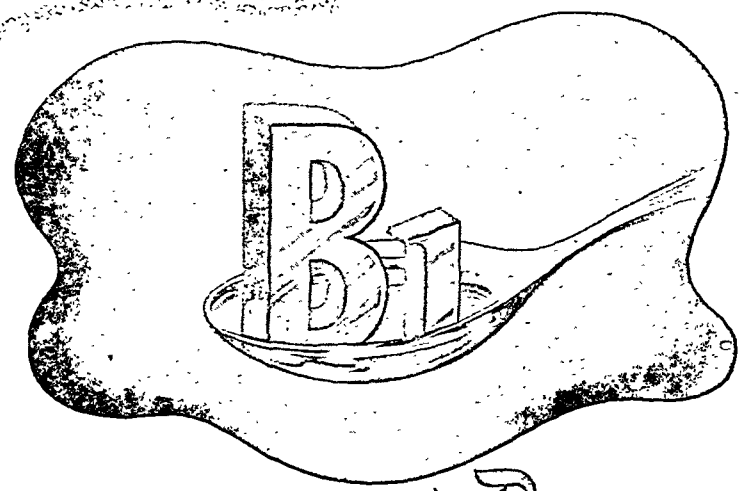
In the particular matter of the instructions upon the treatment of head injuries to which he objects, Mr. Lake may possibly be willing to concede to me, who am neither bureaucrat nor neurosurgeon, a dispassionate point of view and one founded upon some experience. Through the courtesy of a surgical colleague I have had the opportunity in the special "head centre" of an E.M.S. hospital to see a considerable number of recent cases of head injury of all grades of severity. This experience has fully convinced me of both the need and the soundness of the instructions referred to adversely by Mr. Lake, and it has led me to the two following conclusions:

1. That hitherto we have all been very ignorant of the incidence, range, and character of the abnormal neurological signs that may accompany apparently trivial scalp wounds unattended by evidence of cranial injury; and that such signs are to be found in a considerable proportion of such cases by those who, trained to elicit them, make a systematic search for them.

2. That, despite the issue some considerable time ago of recommendations for the initial treatment of head injuries, these recommendations are not being as generally adopted as is desirable, with the result that in a proportion of cases the period of treatment and of disability is unnecessarily lengthened and the final prognosis adversely affected.

Facts substantiating these conclusions are shortly to be published by the surgical colleague to whom I have referred.

If these conclusions are sound, no general surgeon can reasonably resent the inference that the surgeon with special experience in craniocerebral surgery is best placed to detect the signs of damage to the brain in apparently trivial head injuries and to formulate rules for the most effective treatment of the latter. That such rules must of necessity in the present circumstances be issued through a Government Department does not permit us to dismiss them as mere bureaucratic interference with medical judgment. To tilt at specialists is an amusement as easy and as unsatisfying as calling grapes sour, but since the subject is raised it may not be amiss to point out that if there be a man more dangerous than the too exclusive specialist it is he who desires to be thought a specialist in every branch of our art and will learn from no one. A considerable experience as a spectator of craniocerebral surgery and its results has convinced me that the theory and the



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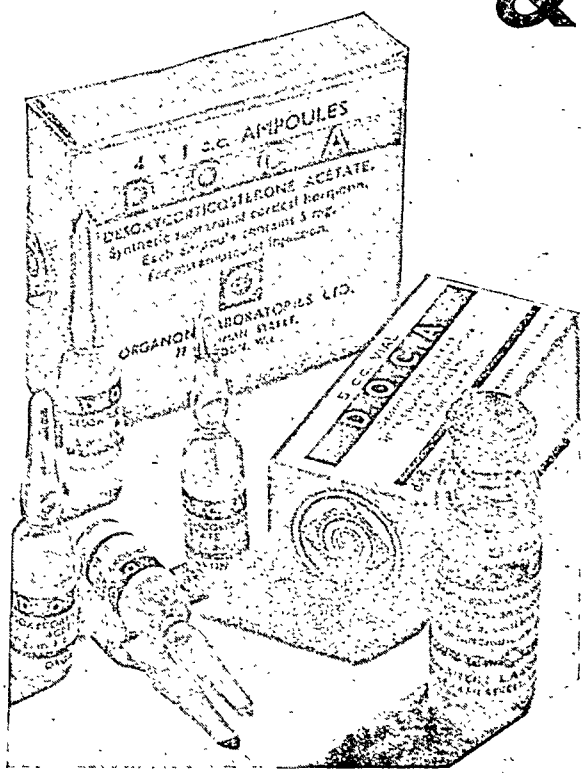
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practice of this branch of surgery are safest in the hands of the specialist, and the general surgeon need suffer no loss of dignity, no matter what his years, in learning from him what he has to teach.

No one seeing large numbers of cases of head injury resulting from air raids can doubt the seriousness of the problem of examination, assessment, and treatment they provide. We shall do ourselves less than justice if, through a false sense of dignity, we decline to avail ourselves of advice that, through whatever official channel it reaches us, is certainly the fruit of the ripest experience.—I am, etc.,

London, W.1, April 23. F. M. R. WALSHE.

Reception and Treatment of Air-raid Casualties

SIR,—Among recent interesting contributions to the *Journal* on the reception and treatment of air-raid casualties, a subject of considerable moment to all those of us called upon to carry out this duty, Mr. John Robert Lee's description (April 19, p. 584) of his routine stands out by virtue of its restraint and accuracy. The desperate conditions under which he has worked are only too well known to most of us. His classification of casualties is the one which circumstances dictate; his care for the individual patient (so rare in these days of schemes) is obvious; and how true his statement that methods successful in the proper treatment of road, rail, and machinery accidents are equally successful for the even more serious air-raid injury! Sulphanilamide is not an easy substitute for the meticulous excision and suture of wounds, but a means of avoiding infection in those cases where it is impossible to carry out the counsel of perfection.

Three of Mr. Lee's remarks interested me particularly as reflecting my own state of mind. The effort to avoid amputation is always worth while, and, as he states, is nearly always successful. We also have struck the idea of two surgeons operating on one patient with multiple injuries and the results are gratifying, particularly when one of the lesions is abdominal. Mr. Lee likes to keep Group 3 cases under his own care; so do we all, and the moving of a patient bombed and operated on within twenty-four hours horrifies me more each time it recurs. The inevitability of the recurrence is even more horrifying. Surely the powers that be should realize by now that the right place to treat air-raid casualties is somewhere outside the bombed area, not in it.—I am, etc.,

Liverpool, April 21. E. N. WARDLE.

Renal Failure in Air-raid Casualties

SIR,—I have been interested to read reports in your *Journal* of air-raid casualties treated by intravenous injections of fluids in the presence of renal failure. It may not be out of place for me to record my own conclusions concerning the intravenous administration of fluids in relation to renal failure, coming on post-operatively in urinary cases.

Renal failure is sometimes not only made worse but is actually initiated by intravenous fluids administered either too generously or too quickly. Because of these consequences, while the drip is going on a careful check must be kept on the urinary output, and if this is found to be in abeyance it might well be asked, What is becoming of the fluid that is being put into the patient's vein? The strong suspicion that it is collecting in the various organs and tissues of the body should be a sufficient reason for discontinuing the transfusion. My own rule in treating renal failure is not to give more than a total of two pints administered continuously over a period of eight hours, and to abandon this form of treatment entirely if there is no important increase in the volume of urine after the patient has received twenty ounces of fluid continuously administered in the course of four hours (rate of drip, 40 drops per minute). For, in such circumstances, to persist with the transfusion to any considerable extent, in my experience, invariably leads to widespread oedema and death. Post-mortem examination in such a case will show that the kidneys have shared in the general oedema, and thus further interference with function has occurred of organs of which the activity had already been impaired.

Under war conditions the danger of renal oedema occurring in some cases of injury with shock certainly also calls for the most careful control of intravenous administration.—I am, etc.,

London, W.1, April 23. H. P. WINSBURY-WHITE.

Crush Injury and Experimental Uraemia

SIR,—It was with great interest that I noticed reports of a series of cases of renal failure following crush injuries in your issue of March 22. Although this syndrome is new to clinical experience it is already quite well known in the realm of experimental medicine. I feel that it is important that this work should be brought to light at the present moment, as it may prove of use in the treatment of future air-raid casualties.

All who are interested in this condition will be well repaid by consulting an admirable and most comprehensive article on experimental uraemia by E. Andrews, in the *Archives of Internal Medicine*, vol. 40. He first showed, in experiments carried out on dogs, that the total amount of water it is possible to make an animal excrete by the kidneys by injecting hypertonic saline was proportional to the CO_2-combining power of its blood, and that when a tourniquet which had been tightly applied to the leg was released there was a fall in the CO_2-combining power and urinary output. The mechanism whereby this arrest of urine formation was brought about was considered to be due to the liberation of lactic acid into the circulation from the damaged muscle, in which there seems to be some defect in glucose oxidation with the tourniquet applied. By a combination of these two experimental procedures it was possible to reproduce a practically perfect picture of the "uraemic syndrome." Many of the signs were caused by upset of the mineral salt metabolism and the ensuing altered cellular permeability.

R. N. Bieter, carrying out direct microscopical observations of the living frog's kidney, demonstrated a reduction in the number of glomeruli showing active circulation following the release of a tourniquet. This effect could be prevented by cutting the sympathetic chain (*Amer. J. Physiol.*, 91). I had myself in 1936 the opportunity of verifying these latter observations, and I also made a few additional ones of my own. I found that in the glomeruli whose activity had been arrested by the release of a tourniquet the capillary loops were distended with red cells, unlike the normal functional intermittency exhibited by the glomeruli of the frog's kidney, in which the capillaries are constricted and contain only a few red cells. If the animal was excreting a dye such as phenol red when the reduction of functioning glomeruli occurred, it was seen to become concentrated in the distal convoluted tubules, appearing as dark red streaks. It was usually impossible to attach a tubule to any particular glomerulus, but with the return of the circulation the dye was seen to be washed out. The concentration was very high in the distal tubules during the period of stasis, due to both the absorption of water and the secretion of the dye, so that any toxic substance present would probably reach a fairly lethal concentration capable of damaging the tubular epithelium.

I trust that these references may be of some use to those investigating this problem.—I am, etc.,

HUGH MILLER.
March 31. Surgeon Lieutenant, R.N.V.R.

Volume of Transfused Fluids

SIR,—Prof. H. A. Harris, writing in the *Journal* of March 29 (p. 491), comments upon the treatment of air-raid casualties described in a recent paper by Bywaters *et al* (*Journal* March 22). He objects in particular to the volume of fluid injected, and makes a plea for peace, quiet, rest, and non-interference in the resuscitation of the severely injured. While all will agree with the first three, the last, if it means withholding the benefits of early and rapid fluid replacement, will entail the loss of many lives, as anyone will testify who has watched the almost magical return from the apparently moribund of severely shocked casualties treated by rapid transfusion of blood and plasma. This was illustrated most forcibly by a recent case.

A flight lieutenant sustained very severe multiple compound fractures of both legs below the knees at 11.30 p.m. Morphine and first aid were given on the spot, and he arrived in hospital at 2 a.m. after a ten-mile journey over country roads. He was then grey, cold, sweating, almost pulseless, blood pressure ? 30. Transfusion, warmth, further morphine, and oxygen

by B.L.B. mask were immediately started, and his subsequent course was as follows:

Time	Fluid 1 bottle = 540 c.cm.	B.P. Systolic	Pulse Rate	Transfusion Rate
2 a.m. ..	—	?30	—	
2.15 a.m. ..	Plasma 1 bottle ..	70	150	Given rapidly
2.30 a.m. ..	Blood 1 ,, ..	85	145	Great improvement in colour and temp.
3.15 a.m. ..	Blood 1 ,, ..	95	145	
4.30 a.m. ..	Plasma 1 ,, ..	110	140	Fast drip
7.30 a.m. ..	Blood 1 ,, ..	90	130	Slow drip
10.30 a.m. ..	Blood 1 ,, ..	120	135	
12 noon ..	Plasma 1 ,, ..	120	130	

He was then considered fit for operation, which consisted of rapid excision of his extensive wounds, local application of sulphapyridine powder and vaseline gauze, and closed plaster, under nitrous oxide and oxygen. Bleeding was not marked, but there was a progressive fall in blood pressure to 85. Transfusion was continued with blood as a fast drip:

Time	Fluid	Systolic B.P.	Pulse Rate	Transfusion Rate
1.00 p.m. ..	Blood 1 bottle ..	85	150	Fast drip
6.00 p.m. ..	Plasma 1 ,, ..	120	145	Slow drip

The transfusion was then stopped; oxygen was given continuously throughout the day. Next day he was remarkably well, blood pressure 135 (his normal pressure is 140), but pulse rate still 140. Ten days later he was still progressing favourably, but as his haemoglobin was then 45, a three-bottle slow-drip transfusion of fresh blood was given.

This case illustrates the following points: (1) The value in severe shock of immediate massive transfusion. He had 2,700 c.cm. of fresh Group O blood, and 2,160 c.cm. of (pooled) plasma—a total of 4,860 c.cm. in sixteen hours. (2) The importance of controlling such transfusions by serial blood-pressure readings. (3) The unreliability of the pulse rate as an index of recovery from shock. (4) The number of donors involved in the treatment of a single severe casualty—in this case approximately twenty. (5) The enormous loss of fluid which must take place in severe multiple injuries. The patient described is slightly built, weight 10½ stone, and his normal blood volume cannot have been more than about 5,500 c.cm. If he bled 2,000 c.cm. at the time of injury, and a further 500 c.cm. at operation, the remaining 2,300 c.cm. represented plasma loss into the traumatized areas. It is my experience, and that of others (Whitby *et al.*, 1941), that the usual volume of fluids required to resuscitate the severely shocked is approximately four bottles (2,160 c.cm.), and the case described is atypical in that the patient required more than double this amount.—I am, etc.,

W. WYNNE WILLSON,
Captain, R.A.M.C.
April 25. Army Blood Transfusion Service.

Treatment of Burns

SIR,—Dr. E. C. Dawson, Mr. C. C. Holman, and Dr. George Adam (April 19, p. 602) raise questions which are ever present in the minds of those of us who are working on burns.

I do not think it can be too frequently stressed that so far as treatment is concerned burns fall into two main categories. The first category consists of those in which there is partial skin destruction only. Regeneration will occur under any method of treatment, and it is only necessary to avoid the infliction of further damage by either coagulation or the frequent repetition of adherent dressings. For this class of burn, therefore, there would appear to be no particular argument for or against the use of paraffin wax, vaseline packs, adhesive tape, or even plaster. Some of these substances will not be applicable in all areas and none of them appear to me to be ideal. In the treatment of burnt hands conservation of joint function is so essential that particular care must be taken to avoid any method which limits joint movement, and up to the moment it seems certain that the best method of treatment consists in the use of saline baths. This also presents technical difficulties which may prevent it from being universally applicable. A more perfect treatment would, I think, be a completely elastic, occlusive, antiseptic dressing which could be easily applied and, if necessary, easily removed. It should not interfere with epithelial regeneration and should be sufficiently stable to remain in place without protection for at least ten days. These desiderata sound simple, but there are many technical difficulties which I hope will be shortly overcome.

The second category of burns is that in which skin destruction is complete. If the area is small any method will allow slow centripetal regeneration. If the area is large this cannot be expected to occur and grafting will be necessary. Our aim is to do this at the earliest possible moment to prevent fibrosis and to conserve function. None of the older methods of treatment will provide a clean, relatively sterile area for grafting purposes, and here again we realize the need for new methods. Under the occlusive treatment by plaster-of-Paris or adhesive tape, I find sterility is never reached, though the bacteriology may, after initial changes, become constant.

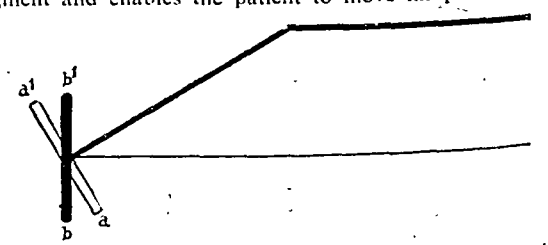
Your correspondents will have noted that I have said nothing about tannic acid. Perhaps it has its place in some burns in the first category, but even in this class experience leads me to believe that its potentialities for danger, if applied to the hands or face, are very great. If it is used for the second category of burns it cannot be expected to succeed, since it depends for its separation upon epithelial regeneration, which we know will not occur. The only alternative methods whereby it may be removed are either subjacent sepsis or surgical interference. One further point against its use is that most of us find ourselves quite incapable of deciding within the first few hours the exact degree of any burn. This is not evident for some days, and if tanning is to be delayed until that time most of its advantages will have been lost and it will be subject to the greater probability of subsequent sepsis.

So many divergent views have recently been expressed that it must be obvious that no ideal method of treatment for burns is yet available. At the beginning of the war opinions were more or less standardized but were based upon civilian injuries. Further experience and increasing knowledge lead me to believe that a satisfactory solution has yet to be found. I have hopes that this may not be long delayed, and in the meantime would suggest that only innocuous substances which will not vitiate any final treatment should be used for first-aid purposes.—I am, etc.,

London, W.1, April 22. RAINSFORD MOWLEM.

A Thomas Splint Modified to Braun's Type

SIR,—It was very interesting to read Mr. J. C. R. Hindenach's note (April 12, p. 558) on the use of a bent Thomas splint in lieu of a Braun splint for fractures of the tibia. Having used a Thomas splint instead of a Braun splint on these lines for the past two years I can fully recommend its merits. Not only is it an ideal form of splint for the treatment of fractures of the tibia requiring traction, but it can also be employed with advantage for those fractures of the femur in which the upper fragment is flexed and for which a Braun splint is usually advocated. This applies in particular to fractures of the upper third of the shaft. In the treatment of these the "bent" Thomas splint is an improvement on the Braun splint because when used with "fixed" traction (alone or combined with weight traction) it immobilizes the upper fragment and enables the patient to move his pelvis (for the



use of the bed-pan, etc.) without pain. This is not possible when a Braun splint is used, for in this case any movement of the trunk is accompanied by movement of the upper fragment since its immobility is dependent on weight traction only.

One modification of the Thomas splint should always be made when it is bent at the knee. The ring should be tilted on the bars so that its plane lies at right-angles to that of the bars below the knee (see diagram). This will obviate two things: (1) undue pressure on the groin which would other-

wise result from elevating the splint; and (2) tilting of the splint from pressure on the lower half of the ring. It is then not necessary to allow for the ring to sink into the bed as described by Mr. Hindenach.

Finally it needs to be emphasized that whenever a Thomas splint is used with "fixed" traction (apart from its use as a purely emergency measure) the ring should always be a good fit.—I am, etc.,

Liverpool, April 19. G. E. THOMAS, F.R.C.S., M.Ch.(Orth.)

Wound Healing

SIR,—Your important leading article on problems in wound healing (April 12, p. 560) draws attention to the point that at long last some surgeons are alive to the fact that it is necessary for them to consider their patients both medically as well as surgically. For the healing of wounds of all sorts we have to remember that all we can do is to help Nature in her work of repair. The healing process is dependent on the health of the body cells, especially in the neighbourhood of the wound, though it is difficult, if not wrong, to think of the possibility of some of the cells of the body being healthy and others unhealthy.

You kindly allowed me on April 5, 1906, and July 15, 1906, to point out the value of lime salts—calcium chloride in medical wounds such as ulcers, and calcium iodide for ulcers of the legs, and, still later, calcium permanganate for ulcers of the stomach. The value of calcium salts is now fully recognized, though when I first advocated their use I was thought to have lime on the brain. Strangely enough, even to-day the value of iodine combined with calcium as calcium iodide is still not recognized as it ought to be, although it is tasteless, non-depressing, and does not produce iodism.—I am, etc.,

Swansea, April 15. G. ARBOUR STEPHENS.

Milk in Wartime

SIR,—One factor which has favoured the recent improvement in the public health is in jeopardy—the increased use of liquid milk. In this last month of March this country consumed 63,000,000 gallons of liquid milk, a record figure since the Milk Marketing Board has been in the saddle. It is almost double the initial figure. Milk in school, milk for nursing mothers and expectant mothers, milk for young children, and, in a different category, the consumption of milk in milk bars and with the morning porridge have all contributed to this result. It cannot be doubted it is especially beneficial at this time when other sources of "good" protein are reduced.

Yet it is just at this time the Minister for Agriculture speaks of reducing the numbers of cattle in the country and of reducing each class of cattle proportionately. That is to say, it is suggested that in-calf heifers, and young cows in their first lactation, shall be reduced in proportion, as well as the veterans of a number of lactations. The reason for reduction, of course, is the diminished amounts of feeding stuffs imported. I would respectfully submit the following considerations as seeming to warrant a modification of this policy:

(1) The shortage of imported foodstuffs for cattle may prove, in the long run, an unalloyed blessing—that is, if our dairy farmers plough their grass, in their rotation, and grow their cattle feed as their forefathers did. There is a growing realization that all is not well with a system based on foreign feeding stuffs, and that disease, rampant when they are used, is negligible in herds fed on the produce of our own soil. I assume high tillage. Let me give an instance of what is possible. A large-scale dairy farmer, curtailed in his supplies, from the docks, of cake and so forth, ploughs up old park land with a doormat-like turf, turns it under, ploughing deep; and at the same time, to counter both acidity and wireworm, salts the land with 5 cwt. of salt per acre. Then he sows with oats and beans. What a magnificent crop results! How his cattle relish it! His neighbours, used to monoculture, have their eyes opened to the advantage of the Oriental system of mixed cropping. And the beans provide oil which we had almost come to think must be bought from abroad.

(2) Would it not be wiser to encourage some such policy and at the same time to make any reduction that must be made in the head of dairy stock in the older milch cows and such as are the subjects of doubt and anxiety? The late Prof. Delépine used to say that infection was conveyed by the older cows: even if the young had contracted disease, it had not had time to reach an infectious stage.

Anyhow, by all means, let us maintain the high supply and high popularity of liquid milk.—I am, etc.,

Holmes Chapel, April 21. LIONEL JAS. PICTON.

Discission of Secondary Cataract

SIR,—The value of an effective mydriatic in making the lens capsule taut, and therefore easing its discission, is rightly stressed by Mr. F. E. Preston (April 19, p. 609). But the one certain means of dealing with an elastic capsule, or any capsule for that matter, is the use of two Bowman's needles thus:

The patient lies on his back. The eye is anaesthetized. The speculum is inserted. The capsule is illuminated by a focal beam. The operator wears binocular magnifiers. He stands behind the patient's head. The eye is fixed by forceps at III on the clock face. One needle is pushed through the sclero-corneal margin at IX o'clock. The capsule is tested. If it be elastic the fixation forceps are put down and the eye held by the one needle only. Then the second needle is inserted at III o'clock. Both needle blades are now in the anterior chamber. The capsule can be held by one needle and cut or torn by the other; or it can be twisted and torn away from its adhesions by rotating one needle over the other. Good control means less pull upon the eye.—I am, etc.,

Crockham Hill, April 21 N. BISHOP HARMAN.

Continuous Pentothal Anaesthesia

SIR,—I have been interested in two recent letters on this subject, one by Dr. R. Hastings Moore (March 22, p. 462) and the other by Dr. Geoffrey Organe (April 5, p. 535). In view of these, and following two personal cases, I venture to offer a further letter on the subject.

1. *Fibrillation of Muscles.*—This is rarer with pentothal than with evipan, and may often be avoided by warming the fluid and allowing it to stand for two to five minutes before injecting. It also helps to avoid restlessness during induction and recovery.

2. *Sudden Muscular Contraction.*—This may occur in spite of muscular relaxation being present, and is more especially seen in vulvar, bladder, and perineal operations, stimuli from which evoke strong reflex responses.

3. *Very Shallow Breathing and Cyanosis.*—I strongly endorse all these authors have to say concerning inexperience in the use of these drugs, and in the measures which should be at hand for resuscitation. My two cases will help to stress this point.

4. *Persistent Coughing.*—I have found that over-rapid injection with the presence of mucus in the pharynx often causes this. The value of premedication is well seen here. I am aware that others say that too slow an injection is the cause of these symptoms and of parasympathetic overactivity—namely, coughing, sneezing, and hiccup. I agree with Dr Organe in saying that in these cases the injection is better discontinued after 1 gramme (20 c.cm. 5% solution) has been injected, and the subject considered unsatisfactory for this form of anaesthesia.

5. *Severe Laryngeal Spasm.*—This is undoubtedly the result of a surgical stimulus which has evoked a reflex response in the presence of too light a level of anaesthesia. It is closely related to point 2. Stretching the anal sphincter requires a deep level of anaesthesia, and for this reason I consider most cases of "haemorrhoids" are unsuitable for pentothal. A spinal anaesthetic is pre-eminent in this sphere of surgery. Except for out-patients and the aged, I always favour light premedication before injecting these quick-acting barbiturates.

Case 1.—This occurred soon after I had qualified. I was asked to anaesthetize an old cachectic man of 70 for the removal of radium needles from the throat. Recalling the original estimation of dosage for evipan, I injected 1 c.cm. every fifteen seconds until consciousness was lost. Observing this quantity to be about 5 c.cm., I forthwith injected the remaining 5 c.cm. Following the removal of the needles I was horrified to find the patient black in the face and not

breathing. Fortunately his heart and circulation remained active, so that artificial respiration, intratracheal O_2 and CO_2, and intravenous coramine saved him. This lesson happily occurred early enough for me to realize the dangers of this technique and to study closely the indications and contra-indications for the drug.

Case 2.—Here I was an onlooker. A house-surgeon employed the above method of dosage for excision of a papilloma on the chin of an anxious man of 68 admitted direct to the theatre from "out-patients." Here respiration ceased following marked uncorrected cyanosis, and was followed soon after by cessation of the heart beat. All the above resuscitative measures, as well as intracardiac puncture and cardiac massage, proved unavailing. It may be stressed here that intravenous coramine is a waste of time in the absence of a heart beat. Nothing short of intracardiac puncture with subsequent cardiac massage and continuous endotracheal oxygen with artificial respiration will be of any avail.

In view of these two cases it is important to read carefully the full literature as supplied by the makers of these barbiturates, or that found in the textbooks, and not to rely solely on the small paper pamphlets which can be found inside the cartons containing the ampoules. It is a regrettable misfortune when a fatality occurs to an out-patient or for a very minor operation. Regarding these two cases, I am aware that both failed to do justice to a recognized technique of dosage.

The "biological" dosage scheme was introduced by Lauber. Maintaining a constant rate of injection, the patient is made to count, and thus the moment is noted when consciousness is lost. Then if the patient is young and strong, as much again is injected for short operations, and twice as much for a long operation. If the patient is old or cachectic then half as much again is injected for short operations or one and a half times as much for a longer operation.

This clearly indicates that in the two cases reported this method was misused, and therein lies the danger. A method such as this may be misunderstood, or one of its points not correctly grasped, by the anaesthetist. The result is totally unfair to the drug and serves to bring it or the entire group of short-acting barbiturates into undeserved disrepute. It is better to gauge the dose *during* the injection by careful observation of the patient.

Concerning the safety factor of these drugs, an early investigation of 6,500 cases showed eight deaths, a mortality of 0.123%; another series of 20,000 gave twenty-two deaths, a mortality of 0.11%. Although figures may be misleading, this is alarmingly high, and is probably due to over-rapid injection—misuse of method—and poor selection of patients.[1] My reason for recording these two cases is simply to warn the inexperienced or over-confident of the unforeseen dangers which lie in the administration of these drugs. These dangers lie in the extreme ease with which they are injected and produce their results.

The question, "How long does pentothal last?" or "How much shall I give?" requires a very careful answer, depending on a number of conditions. The dosage for each case must be considered individually and due modification made according to circumstances. This is true for the controllable inhalation anaesthetics. How much more true, then, for the so-called "uncontrollable" anaesthetics? The recognition of these conditions and the administration of the appropriate dose constitute the art of the anaesthetist. There can be no rule of thumb to be adhered to in every case. The dose is dependent on the metabolic rate; the age, sex, and weight of the patient; the type and extent of the proposed operation; and the presence or absence of premedication.

With the old method of dosage it is easy to administer an overdose to a debilitated subject without realizing it for a little while. The circulation is slow and depressed and the signs of anaesthesia are delayed. The additional amount may prove to be just double the minimum dose required for the operation. For very short minor operations in healthy subjects adequate anaesthesia is obtained by injecting 5 or 6 c.cm. (0.3 gramme 5%) of pentothal rapidly. This gives time for a tooth extraction or for an incision and drainage. The anaesthesia is transient and deep. Twice this dose in the same patient given slowly over two to three minutes might not even produce unconsciousness. For longer cases the technique which appeals to me, and which I have used without a fatality in 250 cases, is similar to that described by Prof. Macintosh.[2] Estimation of dosage and minute-to-minute control are carried out during the injection by very careful observation of the patient. The mind must not be allowed to concentrate solely upon the barrel of the syringe. The patient has to be watched for loss of consciousness, cyanosis, and relaxation; finally, the site of injection must be observed to avoid extravenous deposition of fluid. Two to three c.cm. is injected in ten to fifteen seconds, followed by a thirty-second safety pause to watch the effects. Further quantities are then injected, having regard to the various conditions mentioned above. Usually I give a further 3 or 4 c.cm. in half to one minute.

Unconsciousness supervenes during, or at the end of, the first safety pause, and relaxation occurs generally after two minutes have elapsed from the start of the injection. The surgeon should be asked not to make any preparation or incision until the full two minutes have elapsed. This will avoid a sudden momentary jerk or even continued restlessness during the operation. The presence of surgical anaesthesia is judged not by the rate but by the shallowness of the respiration. Providing safety pauses are made further quantities are injected, and 1/2 to 1 c.cm. every five to ten minutes is all that is necessary to maintain even anaesthesia. These safety pauses are highly important, and constitute the method of control of dosage as well as obviating any dangers that may arise from retarded circulation or extravenous injection.

These drugs are best given in the recumbent posture and not in the sitting or reversed Trendelenburg positions.—I am, etc.,

W. M. MAIDLOW, M.R.C.S., D.A.

Bristol Royal Infirmary, April 14.

[1] Hewer, C. Langton, *Recent Advances in Anaesthesia and Analgesia*, 1937, p. 112.

[2] Macintosh, R. R., and Pratt, F. B., *Essentials of General Anaesthesia*, 1940, pp. 147, 148, 26.

Successful Adrenal Graft in Addison's Disease

SIR,—I think most clinicians would hesitate to regard any case of Addison's disease as "indisputable," particularly when, as in the case reported by Drs. Katz and Mainzer (April 26, p. 617), there was no pigmentation either in the mouth or elsewhere, and the symptoms had been present for ten years or more.

Low blood pressures, by which I mean a systolic pressure under 100 mm. Hg, are not very uncommon even in healthy adults, and occur much more often in the asthenic type of invalid described by the authors. Without wishing to stress in any way the value of laboratory findings in the diagnosis of Addison's disease, there does not appear to be any evidence from biochemical investigations to support the diagnosis. Possibly a better title for the paper would have been "Grafting of Adrenal Gland in a Case of Suspected Addison's Disease."—I am, etc.,

J. J. CONYBEARE.

London, S.E.1, April 28.

Acute Abdominal Pain after Opium Medication

SIR,—Mr. H. P. Winsbury-White, in his letter under the above heading (March 22, p. 461), asks for other practitioners' experiences, and I venture to report a case which occurred last week. A man of 35 with a comminuted fracture of the leg was given morphine sulphate 1/4 grain hypodermically, and within ten minutes he was seized with violent colicky abdominal pains. He writhed about in bed; he resented palpation of the epigastrium; and I could not help wondering if he had a perforation. There was no vomiting, and the pain passed off in about an hour.

Case No. 4 in Mr. Winsbury-White's series was relieved by atropine; but the case here reported had already received 1/100 grain of the latter drug some twenty minutes previously in anticipation of a general anaesthetic. The dosage of morphine here was not large. Had I not seen Mr. Winsbury-White's letter I should have been even more puzzled at the onset of pain after morphine than I actually was.—I am, etc.,

E. MARCUS LIDDLE.

Crewe, Feb. 15.

Vitamin B_1 in Diphtheria

SIR,—We have read with interest Dr. Hugh Climie's letter (April 12, p. 572) on vitamin B_1 in diphtheria. We suggest that his cases are of very doubtful value in the elucidation of the value of vitamin B_1 in diphtheria, especially as he apparently has not checked his results by controls.

He states that "there would appear to be need for further investigation into this subject, but the use of vitamin B_1 in cases of severe diphtheria would seem justifiable to ensure complete oxidation of the large quantities of glucose usually given to such cases." We would like to bring to Dr. Climie's notice the following. Prof. Peters and his colleagues have shown that vitamin B_1 is important in the later oxidation changes of glucose, and if this vitamin was deficient an increase of pyruvic acid could be demonstrated in the tissues of the blood of experimental animals. Peters and Cunningham[1] carried out a series of analyses on normal guinea-pigs bled to death. Another series of guinea-pigs were inoculated with four minimum lethal doses of diphtheria toxin and estimations of pyruvic acid were made on the blood taken shortly before death. The figures for the injected animals showed no appreciable deviation from the normal figures. They then attempted to produce the chronic form of the disease by injecting toxin and later concentrated antitoxin. Their results on these animals also showed no significant deviation from the normal. The muscles of some of both the normal and the injected animals were tested qualitatively for pyruvate, the reaction was always negative, except in one or two isolated cases. They followed up their animal experiments by clinical ones and demonstrated that the percentage of pyruvic acid in the blood of two severe cases of diphtheria suffering from paralytic sequelae showed no considerable alteration from the normal. These two workers concluded their article with the statement that "it is thus obvious from the experimental and clinical results that the stage of glycolysis in which vitamin B_1 is concerned is not affected by the diphtheria toxin, and no benefit arises in this condition from its administration."—We are, etc.,

G. E. DONOVAN,
Public Health Dept., Gorseinon, Swansea.
MURIEL BANNISTER,
The Royal Infirmary, Worcester.

April 21.

Cause of Appendicitis

SIR,—I have only just seen the letter of Dr. J. Price Williams (November 2, 1940, p. 612). He notes that appendicitis is a disease characteristic of the last half-century, and while he rejects the idea that it is due to meat-eating, he implies by his reference to castor oil that constipation is an important factor in its causation. It is interesting to note in this respect that around 1890 white bread came into general use, and as a result the average daily intake of vitamin B_1 in England fell from about 1,000 I.U. (from all foods eaten) to 300 I.U.[2] The minimum daily intake for health is estimated at from 300 to 600 I.U.,[3] while 646 has been recommended.[4] Animal experiments suggest that a deficiency results in diminished tone of the non-striped muscle of the intestine, and a supplement of B_1 has been recommended in the treatment of constipation.[5] The retention of faecal matter in the caecum, assisted by gravity, would seem to provide the ideal condition for the development of appendicitis, especially if there is atonia. If this is so, beriberi should be associated with a high incidence of appendicitis, other things being equal. But they are not. The beriberi of rice-eating countries occurs where consumption of meat and other foods liable to rapid putrefaction is relatively very small.

The likelihood that appendicitis is largely due to the combination of a critically low intake of vitamin B_1 and a fairly large amount of animal protein and too little "bulk" seems sufficient to justify investigation. If steps are taken to ensure adequate supplies of B_1 in the nation's diet by encouraging the widespread use of wholemeal flour, or at least the fortified loaf, together with the effect of meat rationing, it is possible that the number of appendicitis cases may fall significantly. It would be interesting to know if any figures are available.—I am, etc.,

St Andrews, April 16. F. L. ROBERTSHAW.

SIR,—Your excellent *Journal* is of necessity read in this remote place some months after publication. In your issue of October 12, 1940 (p. 505), I read with growing consternation a letter on the cause of appendicitis by Dr. Josiah Oldfield. That such treatment is practised and such views held in these enlightened times is to my way of thinking little short of astonishing. Admittedly many reputable surgeons still administer large doses of anti-gas-gangrene serum in cases of acute appendicitis complicated by rupture, but I have yet to see this application of Dr. Oldfield's theory do any good.

One agrees with Dr. J. Price Williams (September 14, 1940, p. 367) that the cause of appendicitis is trauma, but surely the trauma is not always *in the cradle. If Dr. Oldfield took the* trouble to brush up his anatomy he would find that the appendix, in respect of its blood supply, is divided into thirds, and that at operation any of these thirds may even be gangrenous while the other two appear quite normal: surely the steak was not just one-third bad which in its caecal putrefaction caused this catastrophe. Again, how does he explain the acute appendicitis which occasionally complicates enteritis, when the passage of food through the intestine is often distressingly rapid? Appendical pain is not always caused by appendicitis: only to-day I removed an appendix which had caused its owner severe pain, and yet it was normal except that it contained a coprolith—obviously a case of appendical colic comparable to that caused by a stone in the ureter.

Every case I see convinces me that the cause of appendicitis is traumatic, inasmuch as the trauma is to the blood vessels, first causing engorgement, by venous interference, and oedema (the white stiff appendix) and later anaemia, by arterial interference, and gangrene. At this point the organisms from the much-maligned caecum begin their invasion. When one argues why this vascular trauma should occur deeper waters are reached. Far be it from me to state that diet, and with it more or less habitual constipation, have no part—most probably they are the exciting cause of the trauma by interfering with the relative position of the meso-appendix.

Dr. Oldfield's treatment with its enemata, long fasting, and castor oil is even more drastic and uncomfortable than an operation with little or no disturbance of the other abdominal viscera. In this country we favour the muscle-splitting incision, and the resulting harm to the abdominal wall is practically *nil*. I am neither a long-intestined frugivore nor a short-intestined carnivore, but Heaven preserve me from a colectomy so that I can exist on modern food.—I am, etc.,

Darwin, N.T., Australia, Jan. 9. C. LELEL.

"Heat Convulsion"

SIR,—The following case of "heat convulsion" may be of interest to some of your readers, as it presents a number of unusual features.

A male aged 18 was admitted to hospital with an acute osteomyelitis of the left tibia. He had a temperature of 104.6° F. and a pulse of 80. His general condition was good. Operation was decided upon, and I ordered 1/4 grain of morphine pre-operatively. Anaesthesia was induced with gas-and-oxygen, using a Coxeter apparatus and employing partial rebreathing from the outset. No ether was given at any stage. At the beginning of induction he became a shade cyanosed, but this was rapidly relieved as anaesthesia became well established; at no other time did cyanosis occur. He was perspiring very freely and secreting copious quantities of saliva, which poured from his nose and mouth. In an effort to control this fluid loss he was given 1/50 grain of atropine. The operation had been in progress only about twenty minutes when I noticed twitching of his facial muscles, accompanied by clonic movements of the arms and legs, which had to be held down by the theatre-room staff. The theatre was hot (80° F.); the patient's temperature had risen to 105° F. and his pulse to 180, while his respirations became irregular. Pus

[1] *Lancet*, 1936, 1, 1161.
[2] Ibid., 1937, 1, 563.
[3] Prof. J. C. Drummond and Anne Wilbraham, *The Englishman's Food.*
[4] *Lancet*, August 3, 1940.
[5] Sir John Orr and David Lubbock, *Feeding the People in Wartime.*
[6] L. S. P. Davidson and Ian Anderson, *A Textbook of Dietetics.*

had been located and the tibia was about to be trephined. A Phillips airway was inserted and 6 litres of oxygen with 1 litre of carbon dioxide per minute was administered in an effort to regulate his breathing. As the continued administration of this mixture had little effect in arresting the development of the convulsion I thought it desirable to give a few c.cm. of pentothal. The convulsion began to wane after only 2 c.cm. had been injected, and had entirely ceased with 4 c.cm. The operation was continued for about another thirty minutes; but there were no further convulsions in the theatre or subsequently in the ward, neither did his condition give rise to any anxiety. On being returned to bed he was given a rectal saline, followed by a continuous intravenous drip saline.

The interesting features about this case are: (*a*) it resembled very closely the so-called "ether convulsion," yet at no time was ether administered; (*b*) the convulsion developed shortly after giving a large dose of atropine; (*c*) the patient's temperature was very high, he was toxic, and in addition the theatre was hot, ventilation being almost non-existent owing to the black-out; (*d*) the operation had been in progress only a short time, the patient was inclined to be lightly under, and his colour was good; (*e*) oxygen and carbon dioxide had little effect in arresting the condition, which was readily stopped with a small dose of pentothal.

In my opinion this was a heat convulsion entirely due to hyperpyrexia aggravated possibly by the heat of the theatre plus the toxic condition of the patient.

I am indebted to Wing Commander R. Thorpe, senior medical officer on the station, for permission to publish this case.—I am, etc.,

March 26. S. E. OSBORNE.

Medical Planning Commission

SIR,—If the views expressed in the letter from Dr. Genge printed in your issue of April 19 were his alone it were best ignored and left to a speedy and a kindly oblivion. But his letter is written on behalf of the Medical and Panel Committee of an important county borough, and if we are to believe that these are the considered opinions of a representative group of general practitioners, then indeed mischief is afoot.

It is common ground that doctors wish to place their skill at the service of their fellows and that they wish to do so under reasonable conditions, both financial and administrative. It is common ground that the present confusion in the medical services of the country causes grave dissatisfaction in our profession and robs the community of service urgently needed.

Most of us look to the Medical Planning Commission to make proposals the effect of which would be to unite the profession in rendering improved service to the community. But not so Dr. Genge. Myopia and delusions of persecution unhappily combine to make him wish to fling the general practitioners into a war on three fronts—against medical officers of health exercising insufferable powers, against consultants casting envious glances, and against a third foe not so clearly defined who is to be overthrown by loud shouting. So impatient is Dr. Genge for the battle to begin that he cannot wait to hear what the Commission has to propose. So intent is he on victory that he does not pause to consider that in such a war the good name of our profession and the service of the public would both be casualties. It is a sad case occurring in a localized epidemic. Prompt reflection should prevent spread.—I am, etc.,

Potters Bar, April 23 MAITLAND RADFORD.

SIR,—Criticism levelled against the Medical Planning Commission has been the consequence of lack of information, and the feeling of misgiving much lessened by the timely letter of Mr H. S. Souttar (April 12, p. 569). Had it been written at the time of the announcement of the Commission one would have felt that, although the Executive was acting within its rights constitutionally, the terms of reference were not quite so purposeless as at first appeared to be the case. For surely the terms of reference are quite contrary to the purpose of the Commission as implied by its name, Medical *Planning* Commission.

The Commission as constituted, with facilities at its disposal for comprehensive inquiry, is quite capable of discovering why medical reforms are necessary. Further, from a review of the situation in this and other countries, and of methods of reform previously suggested, practicable alternative proposals for future adoption may be made. But in what respect is this inquiry made necessary by the circumstance of war?

I suggest that this is the proper limit of the scope of the Commission. Therefore it would be well for the Commission, at its first session, to make an authoritative announcement upon its interpretation of the terms of reference. Precision in this respect will ensure a happy environment so far as that is dependent upon the good will of the profession in general.—I am, etc.,

MAURICE WIGFIELD.

Watton-at-Stone, near Hertford, April 26.

Medical Man-power

SIR,—We have heard a great deal lately about the acute shortage of medical personnel. Will anyone courageously publish the facts? For when the facts and the truth are published there is evidence of maldistribution, muddle, and rapacity.

The G.M.C. informed me a year ago that the number on the *Medical Register* was approximately 64,500; this included aged, infirm, retired, and women practitioners. Recently qualified will make this number up to (allowing for death) about 65,500. Of these, I understand, approximately 36,000 are normally engaged in practice in England and Wales. The Services (by which we really mean the Army, as the Navy and Air Force are small numerically in comparison) would like to have, apparently, about one medical officer to every 250 fit and healthy young men; hence for 3,000,000 about 8,000 to 12,000 medical officers, the remaining 42 millions of population being left with the balance, about 24,000 to 28,000 medical practitioners, for all the other services—civil, general practice, consultant, E.M.S., and so on!

Approximately half the Army medical officers are engaged in administrative, clerical, and office duties; the other half who are doing clinical work (so-called), for the most part in the United Kingdom, only treat minor maladies, all serious cases being transported to the local hospitals in their districts. Hence this horde of Army medical officers are not even dealing with, nor have they in many instances the equipment with which to treat, anything like all their cases. At home the Army is rapacious, desiring the lion's share of the nation's limited medical personnel, and having taken these thousands of medical men, for the most part at £450 per annum in a rank and status equivalent to that of a sub-lieutenant R.N., aged 20 years, they do not even do their own work!

It is obvious where combing is required. In many areas general practitioners are being worked to death. What has happened to the thousands of consultants and general practitioners from denuded areas, whose practices have virtually disappeared?—I am, etc.,

CHARLES A. H. FRANKLYN, M.D., M.R.C.S.

Oxford, April 14

Malarial Therapy for Epilepsy

SIR,—In view of Dr. G. de M. Rudolf's letter (April 26, p. 647) and your annotation on the treatment of G.P.I. (March 29, p. 486), the following extract from Dr. O. C. Gruner's translation, para. 228, p. 171, of "The Canon of Medicine" (Avicenna, A.D. 980–1037) might prove of interest:

"Some diseases turn into new ones and so themselves disappear. This is very satisfactory. One disease becomes the medicament for curing another. Thus quartan malaria often cures epilepsy (cf. G.P.I.), also podagra, barices and arthralgias. A spasmodic disease may be cured by scabies, pruritus and furunculosis. A certain type of diarrhoea is cured by inflammation of the eyes. Lienteria cures pleurisy. Bleeding piles removes atrabilious disorders, including sciatica, renal and uterine pain. But the passage from one disease to another may be a serious matter; for instance, when an empyema spreads into the substance of the lung and when meningitis becomes lethargia."

Dr. Rudolf, in his book, mentions the Hippocratic reference to the effect of malaria on epilepsy.—I am, etc.,

M. B. RAY.

London, W.1, April 26.

The "English Disease"

SIR,—In Dr. H. M. Raven's letter (*Journal*, April 19, p. 606) there appears a remark that, though it is not strictly germane to the current controversy about calcium requirements, I should like to be allowed to correct, because it is frequently met.

Rickets was not called the "English disease" because it was particularly characteristic of English children, but because in 1650 Francis Glisson, then holding a Cambridge chair, published the first detailed and accurate description of the disease. From this it derived on the Continent of Europe the appellation quoted by Dr. Raven, but given by him, as by so many other writers, an incorrect and misleading interpretation that is unfair even to our curious climate.—I am, etc.,

Greenford, Middlesex, April 22. A. L. BACHARACH.

Obituary

F. GRIFFITH, M.B., and W. M. SCOTT, M.D

Medical Officers, Ministry of Health

The scientific staff of the Ministry of Health suffered a severe loss last month when Dr. Frederick Griffith and Dr. William McDonald Scott were killed by enemy action. They had long worked together in the Ministry's laboratory in London, and their reputation as bacteriologists was very high.

Dr. Griffith, younger brother of the late Arthur Stanley Griffith, M.D., of whom Sir Arthur MacNalty wrote an appreciation in last week's *Journal*, received his medical training at University College, Liverpool, graduating M.B., Ch.B. of the Victoria University in 1901; he took the D.P.H. of Oxford in 1910. After serving as house-physician and house-surgeon at the Royal Infirmary, Liverpool, he worked in that city as Alexander Fellow in Pathology at the Thompson Yates Laboratory, a post formerly held by his brother, and the two were associated as scientific investigators under the Royal Commission on Tuberculosis, carrying out researches of the first importance. Frederick Griffith was a member of Gray's Inn, and for many years past had been a medical officer of the Local Government Board and later of the Ministry of Health, working in the pathological laboratories from 1911 onwards.

Dr. McDonald Scott was an Edinburgh student, graduating M.B., Ch.B. with first-class honours in 1905, B.Sc. (Public Health) in 1907, and M.D. in 1910; he took the D.T.M. & H. in 1906. He held the Ettles scholarship at the University of Edinburgh, and afterwards the John Lucas Walker studentship in pathology at Cambridge, where he was for some years university demonstrator in pathology. Before joining the laboratory staff of the Local Government Board he had been a medical officer in the Straits Settlements Medical Service. On the establishment of the Ministry of Health in 1920 he became one of its medical officers. McDonald Scott was the author of articles on bacteriology and immunity in the *Encyclopaedia Medica*, and on influenza and anaphylaxis in the Medical Research Council's *System of Bacteriology*. He also wrote an important report in 1916 on meningococci occurring in the spinal fluid and similar micro-organisms in the nasopharynx.

S. GILBERT SCOTT, M.R.C.S., D.M.R.E.

Consulting Radiologist, the London Hospital

We regret to announce the death on April 19 at his home in Bourne End of Dr. Sebastian Gilbert Scott, for many years director of the radiological department at the London Hospital and radiologist to the National Hospital for Diseases of the Chest, and latterly honorary radiologist to the British Red Cross Clinic for the Treatment of Rheumatism. He belonged to a family that has produced famous architects and good doctors: his grandfather was Sir George Gilbert Scott, R.A., his younger brother is Sir Giles Gilbert Scott, R.A.

He was born at Hampstead on January 31, 1879, and was educated at Beaumont College, Windsor, and King's College, London, qualifying M.R.C.S., L.R.C.P. in 1904. After serving as house-surgeon at King's College Hospital and house-physician at the Royal Free Hospital he took up *x*-ray practice and returned to King's, working there as clinical assistant in the electrical department until his appointment to the post of radiologist at the London Hospital in 1909.

During the last war Gilbert Scott was radiologist to the Princess Beatrice Hospital for Officers, the Palace Green Officers' Hospital, and the Military Hospital at Broadstairs. After the war he was appointed consulting radiologist to Queen Alexandra's Military Hospital, Millbank, and a member of the Army *X*-ray Committee. He was a past-president of the Electrotherapeutic Section of the Royal Society of Medicine and held office in the British Medical Association as president of the Section of Radiology and Electrology in 1923, as chairman of the Westminster and Holborn Division 1932–3, and as a member of the Committee on the Causes and Treatment of Arthritis. He took the D.M.R.E. at Cambridge in 1921 and afterwards examined for that diploma. He published many papers on radiological subjects in this and other journals: his *Atlas of Chronic Rheumatic Arthritis (the Hand)* appeared in 1935 and his *Radiology in Relation to Medical Jurisprudence* in 1931. During recent years he took much practical interest in the work of the Charterhouse Rheumatism Clinic and in wide field *x*-ray research under a benefaction from Lord Nuffield.

JOHN SMYTH MACDONALD, F.R.S.

SIR ARTHUR HALL writes:

I should like to add to your recent obituary notice a personal tribute, not only to the work of Macdonald as a physiologist whilst in Sheffield but also to the important part he took in helping us to obtain a Charter for the University. When he was appointed as professor of physiology in 1903 we were still but a University College. The three Colleges of Victoria University had but recently dissolved partnership. Liverpool had already obtained a separate Charter, Leeds was applying for one. With this the recent hopes that Sheffield might one day join Victoria University as a fourth constituent had vanished. To those who had set their hearts on University status for Sheffield Macdonald was a great stimulus. Coming to us direct from Liverpool he was not only familiar himself with the procedure necessary in applying for a Charter but was able to secure for us the personal co-operation of those of his former colleagues and friends who had recently gone through it themselves. The University of Sheffield owes much to his and their help and guidance in those early days. He was entirely responsible for planning the Physiology Department in the University buildings, a department which at that time was one of the best in the country. Besides being the first to hold the chair of physiology in the University, he was Dean of the Faculty of Medicine for several years until he left us in 1914 to succeed Sherrington at Liverpool.

Dr. E. FRETSON SKINNER, an old student of Prof. Macdonald's, sends the following personal tribute:

The physiology department of the Sheffield Medical School, as it then was, and of which he had charge, had an atmosphere of workaday enthusiasm that was stimulating to a degree, and every student who passed through Macdonald's hands must have absorbed and carried away something of his exuberant vitality and purposefulness. He had a true simplicity and kindliness of character, and I never heard him say an unjust or even an unkind word of anyone, not even of one who had done him a grievous hurt. Whatever subject he discussed he brought to it an original touch, and even the simplest routine laboratory experiments under his hands were made to have a real meaning for us. He had a boundless enthusiasm and made those who worked with him participants in it. He would devote hours or days to a single experimental detail, and though keen to fit it into a system of ideas, if it worked

out wrongly he would unhesitatingly discard it and start afresh. Besides possessing a friendliness that endeared him to his juniors, Macdonald was a real teacher. Among other efforts he made to cultivate interest in his classes was that of asking senior students to take a special item in a subject, read it up, and then deliver a lecture to their class-mates. It was indeed a novel idea and could only have succeeded under one who inspired enthusiasm, but it was enjoyed and appreciated by the class. The Sheffield Medical School and the Medical Faculty of the University owe much to his *enthusiasm and originality.*

"C. M. S." writes: In the obituary notice of Dr. DAVID FORSYTH your correspondent "M.B." says that hospital work afforded no scope for the psycho-analytic therapy in which he excelled. With this one cannot disagree, but it should be amplified to the extent that his hospital work certainly enabled him to treat most successfully the milder cases of neurosis that were often admitted to his wards. And, what is possibly of equal importance, those of us who had the privilege of serving Forsyth as house-physicians were given a lasting sympathy with those unfortunately grouped as neurotics—and an ever-increasing understanding of the vital importance of psychology. Forsyth was blessed with great gifts, among them a highly developed clinical sense. Although for many years his main interests were psychological, he kept fully abreast of modern developments in medicine, and gave every encouragement to his H.P.s to try out any new treatment. His ward rounds attracted large numbers of students and his bedside teaching was noteworthy for clarity of expression. We shall miss him for many things, but above all perhaps for his never-failing urbanity and sympathetic hearing of any difficulty, professional or personal.

It is with regret that we note the death of Dr. BERKELEY ROBERTSON, after a short illness, on April 13. Dr. Robertson, who was 60 years of age, was born in Glasgow, educated at Glasgow Academy and Glasgow University, where he graduated in Arts and Science before taking his medical course. He graduated M.B., Ch.B. with commendation in 1904, and then spent a year in house-surgeonships in the Royal and the Western Infirmaries. He belonged to a family noted in Glasgow for its great interest in the Church and in foreign missions, and it seemed natural that he should determine upon medical missions as his life's work. He was appointed to Livingstonia Mission, where he gave notable service in ophthalmology as well as in the other departments of that great mission station. After three and a half years, however, anxiety for his health demanded return home and he was advised to relinquish service in Africa. He settled in practice in the west end of Glasgow and became a noted and esteemed family doctor. In 1912 he took the D.P.H. of Cambridge, and in 1919 he graduated M.D. in Glasgow. Dr. Robertson was of a genial happy disposition, greatly liked by his patients and by his fellow practitioners. A keen Churchman, he took great interest in Church affairs, especially in relation to foreign missions, and was a conscientious member of Session in his own church and a knowledgeable representative of the Livingstonia Mission in the General Assembly. He had a cultured mind, and was well read in theology, philosophy, and poetry. Much sympathy is felt with Mrs. Robertson and her family, one of whom, her son, is beginning the study of medicine at the University of Glasgow.

Dr. GORDON STEWART WOODMAN, who died suddenly on April 15 at Llandudno, was born at Haltwhistle-on-Tyne on January 12, 1891, and was educated at Dollar Institution and the Medical College of Durham University at Newcastle. He graduated M.B., B.S. in 1913 and took the F.R.C.S.Ed. in 1920. At Newcastle he was house-surgeon and junior resident medical officer at the Royal Victoria Infirmary, and then served in India and Mesopotamia with a temporary commission in the R.A.M.C. After the armistice he was civil surgeon at Iraq for a year and then surgical specialist to the new general hospital at Baghdad and surgeon to the Iraq Petroleum Company. For a time he was also director of the surgical unit and professor of clinical surgery at the Royal Hospital, Baghdad. Returning to this country he settled in general practice at Llandudno, and was appointed gynaecologist to the Llandudno District Hospital and the Heroes Memorial Hospital at Blaenau-Festiniog. Dr. Woodman joined the B.M.A. in 1920 and had been honorary secretary of the Mesopotamia Branch, which he represented at the Annual Representative Meetings of 1926 and 1930.

Dr. THOMAS LEATHARD WORMALD, medical officer since 1920 to the Darlington Rural Council, died on April 14. He was born at Prudhoe-on-Tyne on March 9, 1885, and was educated at Darlington and Newcastle, graduating in medicine at the University of Durham in 1906; he took the B.Hy. degree and D.P.H. in 1909, and the M.D. in 1910. Dr. Wormald was the first full-time medical officer to be appointed by the old Darlington Board of Guardians; this was in 1911, after he had been senior assistant medical officer to the Newcastle-on-Tyne workhouse infirmary for three years. During the last war he served with the R.A.M.C. in France at No. 6 General Hospital, in a field ambulance, and as battalion M.O. For the past ten years he had been obstetric physician to the Darlington General Hospital. He joined the British Medical Association in 1909.

News has been received of the death through enemy action of Dr. PETER RUSSELL CAIRNS and his wife, of Southport. Dr. Cairns, a native of Galashiels, was educated at the Old Galashiels Academy and the University of Edinburgh. He qualified L.R.C.P. & S.Ed. and L.R.F.P.S.Glasg. in 1893. For a number of years he was in practice at Southport in partnership with his brother, Dr. Lawson Cairns, and retired from active work some ten years ago. He had been a member of the British Medical Association from 1896 until the time of his retirement.

The following well-known medical practitioners have died abroad: Dr. G. E. VINCENT, president of the University of Minnesota, 1911–17, and of the Rockefeller Foundation in New York, 1917–29, aged 76; Prof. CARLOS G. MALBRAN, the first occupant of the chair of bacteriology at Buenos Aires University; Dr. PEDRO OVIDIO BOLO, vice-president of the Academy of Surgery, of Buenos Aires; Dr. DAVID RIESMAN, formerly professor of clinical medicine in the University of Pennsylvania, and a prolific writer on pathology, medicine, and medical history, aged 73; Dr. EUGEN ENDERLEN, successively professor of surgery at Basle, Würzburg, and Heidelberg, aged 67; Dr. KATE CAMPBELL MEAD, born in Quebec, author of *A History of Women in Medicine*, and formerly president of the International Association of Medical Women, aged 73; Dr. WILLIAM MILES WISHARD, sen., emeritus professor of genito-urinary surgery at the Indiana University School of Medicine, aged 89; Dr. LUDWIG MAYER of Heidelberg, author of works on hypnosis and psychotherapy, aged 48; Dr. HANS GUDDEN, formerly director of the Munich Psychiatric Clinic, aged 73; Dr. CHARLES V. CHAPIN, an eminent epidemiologist who was for forty-seven years medical officer of health for the city of Providence, aged 85.

We are asked to correct the obituary notice of the late Dr. ERIC SNELL which appeared last week (p. 655) by adding that his younger son, Flying Officer E. Peter S. Snell, is also following in the medical tradition of the family and has been a medical officer in the R.A.F.V.R. since last summer.

The annual report of Crichton Royal Institution, Dumfries—the one hundred and first—gives the number of patients under treatment at the close of the year as 1,043, of whom 675 were private. In addition there were 141 patients who had been evacuated from Edinburgh Mental Hospital. The physician-superintendent, Dr. P. K. McCowan, says that among the new admissions it is noteworthy in how few the breakdown can be traced to the war and its attendant anxieties. The reaction of the hospital population to the war varies according to their mental condition. A certain number are so much out of touch with reality that the war means nothing to them, a few weave delusional ideas around it, while the remainder regard it with the same mixture of intelligence and ignorance as the general population. Two cases of schizophrenia following head injury have been treated with insulin at the institution. Both patients seemed doomed to a life of chronic mental invalidism, and both are now living useful lives in the outside community. In another case of schizophrenia electrical shock treatment and detoxication by surgical means, supplemented by occupation, recreation, and psychotherapy, brought about a recovery which would not have been attained by any of these means alone.

Medico-Legal

WRONGFUL DEDUCTION OF PANEL FEES

An insurance practitioner recently succeeded in an action against a county insurance committee for the payment of a sum which had been deducted unlawfully from his capitation fees. Before the deputy judge at Windsor County Court, Dr. H. Tudor Edmunds, of Slough, sued the Bucks Insurance Committee for £3 13s.[1] A satisfied patient, the manager of a firm in business outside the doctor's district, telephoned to the doctor to call and see three of the firm's employees who were ill. He did so, and no one told him they were insured persons. About a week afterwards, when making the entry in his daybook, this possibility entered his mind and he reduced his fees by a half, as he thought the patients might have to contribute some payment to the firm. It appeared later that two of them were insured persons. The firm paid his bill, but afterwards asked him to refund £3 13s., his charge in respect of the two insured persons. The insurance committee without hearing the doctor, deducted this amount from his panel payments. Counsel for the committee suggested to the doctor when he gave evidence that, if he had known that these persons were insured and had treated them as such, he could not have expected a fee from the firm. He replied that a doctor was often called in to deal with the employees of a firm, rather than that the firm should each time summon the panel doctor of a sick employee. He was employed by two firms at Slough whose employees he treated for payment whether they were insured persons or not. Counsel submitted that the judge had no jurisdiction in this matter, because the committee was a semi-judicial body and the question was dealt with in the Medical Benefit Regulations. The judge held that he had jurisdiction. Giving judgment, he said the committee was not entitled to deduct this sum, for the contract under which the doctor was employed was with the firm and not with the insured persons. The patients did not pay, and they were not therefore entitled to recover or to ask the committee to refund the fee. It seemed to him a pity—as, in fact, counsel had admitted—that the committee had not dealt with the doctor more as a professional man should have been dealt with, and at least have heard what he had to say. If they set themselves up as a judicial body, nothing more unjudicial could have taken place. He gave judgment in favour of the doctor for the amount, with costs on the highest scale, in view of the importance of the case to the medical profession and insurance committees.

[1] *Windsor, Slough and Eton Express*, Feb. 7.

STATISTICS OF INFANTICIDE

In a paper read to the Medico-Legal Society Dr. J. C. Matheson, governor and medical officer of Holloway Prison, gave some interesting statistics with regard to infanticide. During the period of five years 1936–40 eighty-one women were admitted into Holloway charged with homicidal offences, and in thirty-six cases the victims had been infants under 12 months old. Dr. Matheson divided these cases into two groups: one for the period from the beginning of 1936 until June, 1938 (when the Infanticide Act of that year came into operation, repealing and re-enacting with modifications the provisions of the previous Act of 1922), and the other for the period from that date until December, 1940. During the earlier period seven of the women were charged at assizes with murder; during the second period, following the passage of the Act, no such cases occurred. The accused women were most commonly between the ages of 20 and 30, and there was no case over 40. Of those in the earlier period nine were married women, eight of whom had had children before, and eleven were unmarried, of whom only one had had a child before; of those in the later period six were married, four of whom had had children before, and ten were unmarried, one of whom had previously had a child. The age of the victims was in the majority of cases under one month. Eleven of the twenty mothers relating to the earlier period, and eight of the sixteen mothers relating to the later period, had made preparations for confinement: the others had made none. As for the mental condition of these thirty-six accused persons, ten had had a positive history of mental impairment, and twenty-six a negative. Dr. Matheson's conclusions were that the lactational period is more important from this point of view than the period of pregnancy and childbirth, and that very often an exhaustion psychosis becomes evident. Infanticide is relatively more common among the unmarried than among the married, and among primiparae than among multiparae. There appears to be no specially favoured method of killing the infant, any one of a large number of methods being employed, and a true amnesia is not common. He did not think that the Act of 1938 had brought about any increase in the crime of infanticide. [The Act of 1938 applies to the killing of "a child under the age of twelve months" instead of to a "newly born" child as in the Act of 1922: it also refers to the effect of lactation as well as of pregnancy and childbirth.]

The Services

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Surgeon Lieut.-Commander JOHN WIDDICOMBE OLIVER, R.N., lost his life at sea in March while serving in H.M.S. *Bonaventure*. He was 33 years of age and was the elder son of Mr. and Mrs. Oliver of Old Bosham. He was educated at Felsted School and won a scholarship to Guy's Hospital, qualifying M.R.C.S., L.R.C.P. in 1931. For a time he was resident medical officer at Ashford Hospital. He entered the Royal Navy as surgeon lieutenant in 1931, and was promoted to surgeon lieutenant-commander in 1937. He was just posted to the Royal Naval Hospital, Haslar, for six months, and then served two and a half years on the China station in H.M.S. *Falcon*, Yangtze Flotilla, and returned to England to the Royal Marine Infirmary, Chatham, until August, 1936, when he was appointed to the Royal Naval Hospital, Great Yarmouth. He joined H.M.S. *Bonaventure* in April, 1940. He had been a member of the British Medical Association for ten years. He leaves a widow.

ARMY AWARD

The Military Cross has been awarded to Captain Prithvi Raj Bali, Army in India Reserve of Officers (Medical), in recognition of gallant and distinguished services in the Middle East.

The October issue of the *Dental Record* contains an entertaining account of the notorious mountebank commonly known as Sequah, by the well-known dental antiquarian Mr. B. K. Townend, who has collected from various sources a considerable amount of information about this extraordinary man. The bulk of evidence, according to Mr. Townend, goes to show that Sequah was born in Cornwall about 1844 and that his real name was William Henry Hartley. After serving in the police force he emigrated to America, where he achieved considerable success with his remedies, though not so great as he subsequently did in this country. On his return to England he successively started three companies in the course of three years, and during the 'eighties and 'nineties acquired a considerable fortune. His activities were not limited to this country, but he visited Tangier and Egypt, where he carried on his performances under the name of Sikwa. Though best known for his extraction of teeth in the market place of towns and villages, which he carried out to the accompaniment of a band and dressed as an Indian chief, he also professed to cure chronic rheumatism, deafness, blindness, rickets, consumption, piles, and all incurable illness. He also probably acquired large profits from the sale of his medicines, the most famous of which were "Sequah Oil," "Prairie Flower," and "Swamp Root Medicine," as well as from a sale of booklets containing rhymes in advertisement of his medicines.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

In Congregation on April 26 a bequest was gratefully accepted from the executors of the late Charles Slater, M.A., M.B., formerly of St. John's College. This is a legacy of £4,000 to the University of Cambridge to be applied for purposes in any way connected with the teaching of or research work in medical science or any other science ancillary to medicine at the absolute discretion of the governing body for the time being of the University.

The following medical degrees have been conferred:

M.B., B.CHIR. (by proxy).—F. S. Jackson, T. W. Rowntree.

UNIVERSITY OF LONDON

The membership of Brigadier P. H. Mitchiner, M.S., F.R.C.S., as representative of the Faculty of Medicine on Convocation, who was due to retire on May 13, 1941, has been continued until May 12, 1942.

The following candidates have been approved at the examination indicated:

POSTGRADUATE DIPLOMA IN PSYCHOLOGICAL MEDICINE.—Helen Baker (with Mental Diseases (Psychiatry)). *Part A:* J. W. Affleck, A. A. G. Clarke, Portia G. Holman, Barbara E. Woodhead.

UNIVERSITY OF ABERDEEN

At a graduation ceremony on April 3 the degree of M.D. was conferred on I. Sacks, and the Diploma in Public Health was awarded to R. F. Macdonald.

The following medals were also awarded: Fife-Jamieson Memorial Gold Medal in Anatomy: W. Burnett. Chanock Gold Medal in Anatomy: M. R. Milne. Lizars Gold Medal in Anatomy: G. E. Mavor.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

Election of Fellows

At a meeting of the Royal College of Physicians of London on April 23, with Sir Charles Wilson, President, in the chair, the following were elected Fellows of the College:

Stanley Wyard, M.D.Lond. (London); John Inkster, M.D.Aberd. (Middlesbrough); James Browning Alexander, M.D.Glasg. (London); Hugh Spear Pemberton, M.B.Liverp. (Liverpool); Edwin George Bleakley Calvert, M.D.Belf. (London); Alexander William Hendry, M.D.Aberd. (Aberdeen); Montague Maizels, M.D.Lond. (Maidstone); Thomas Howard Crozier, M.D.Belf. (Belfast); Frank Alexander Knott, M.D.Lond. (London); Clifford James Fuller, M.D.Oxf. (Exeter); Cyril John Polson, M.D.Birm. (Leeds); Robert Klaber, M.D.Lond. (Bishops Stortford); John Gerald Edward Hayden, M.D.Melb., F.R.A.C.P. (Melbourne); Robert Merttins Bird Mackenna, M.D.Camb. (Liverpool); Charles Percy Pinckney, M.B.Camb. (London); Swithin Pinder Meadows, M.D.Lond. (London); Andrew John Morland, M.D.Lond. (London); Francis Findley Hellier, M.D.Lond. (Leeds); Louis Philippe Eugene Laurent, M.D.Lond. (Basingstoke); Thomas Tennent, M.D.Glasg. (Northampton); John Guyett Scadding, M.D.Lond. (London); Norman Swift Plummer, M.D.Lond (Steyning); Ronald Wilson Fairbrother, M.D.Manch. (Wilmslow); Evan Jones, M.D.Lond. (London); Eric Hamilton Hudson, M.B.Camb (London); Max Leonard Rosenheim, M.D.Camb. (London); Samuel Nevin, M.D.Belf. (London); Gordon Wilkinson Goodhart, M.D.Camb. (London); George Norman Myers, M.D.Durh. (Cambridge); Eric Frank Scowen, M.D.Lond. (London); Alfred Ernest Barclay, M.D.Oxf. (Oxford); James Frederick Brailsford, M.D.Birm. (Birmingham); Robert Montgomery Gordon M.D.Dubl. (Liverpool); and Noel Gordon Harris, M.D.Lond (London). George Cranston Anderson, M.D.Ed. (London); Gordon Roy Cameron, M.B.Melb., D.Sc. (London); Egbert Coleby Morland, M.D., F.R.C.S. (Aylesbury); and Major-General H. Marrian Joseph Perry, C.B., L.R.C.P. & S.I. (London), elected under By-law XXXIX (b).

Surgeon Vice-Admiral Sir Reginald Bond was re-elected representative of the College on the Professional Classes Aid Council. Dr. G. E. Ward was appointed External Examiner in Medicine for the Fellowship Examination of the Faculty of Radiologists.

Admission of Members

The following candidates having satisfied the Censors' Board were admitted Members:

Hector John Anderson, M.B.Camb., Desmond William Ronald Ashby, M.B.Lond., Colin Ross Baxter, M.B.St.And., Harold Williams Fullerton, M.D.Aberd., Lilias Margaret Patria Gairdner, M.B.Lond., Ian Mills Hall, M.B.Lond., Michael Redmond Hayes, L.R.C.P., Frederick Roland George Heaf, M.D.Camb., Cecil John Charles Guy Hodson, M.B.Lond., Arnold Langley Jackson, M.B. Camb., Bertram Alfred Edward Johns, M.B.Birm., Thomas Arthur Kemp, M.B.Camb., Anthony Arthur Gough Lewis, M.B.Lond., Ronald Charles Mackeith, M.D.Oxf., Maurice Nellen, M.B. Capetown, John Wylmer Paulley, Flying Officer, M.B.Lond., John Pemberton, M.D.Lond., John Lawrence Pinniger, M.B.Oxf., Mohammed Sadiq, M.B.Punjab, Dwijendra Bhuson Sen, M.B. Calcutta, John Rupert Squire, M.B.Camb., Euodia Davel Van Der Walt, M.B.Capetown, Alfred John Walker, M.B.Lond.

Licences and Diplomas

Licences to practise physic were conferred upon the following 171 candidates (including 14 women) who had passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board and have complied with the necessary by-laws:

P. H. Abbott, G. C. Acres, R. A. Allen, M. W. Annear, Norah H. L. Armstrong, F. Barasi, R. F. G. Barker, J. S. Barr, J. Ll. Battle, J. W. R. Battram, C. L. F. Beaton, R. C. Bell, W. Black, P. H. Blackiston, D. V. V. Bowen-Jones, K. G. Bowker, A. C. Boyle, W. Ll. Brace, K. T. Brown, J. E. Bulow, H. C. Burbridge, H. C. Burnell, I. C. Campbell, L. S. Carstairs, Joan Cleland, Betty J. Clymo, R. C. Connolly, P. B. Conroy, H. Conte-Mendoza, C. F. Cooper, W. H. Craike, R. McK. Crichton, J. H. Crosland, P. S. Cuthbertson, R. Daley, P. G. Dalgleish, G. J. Ll. Davies, H. Mel. Davies, B. W. Davy, T. Dean, R. M. de Gregory, W. P. Dick, R. G. Dickinson, C. F. Donovan, B. B. Downman, C. H. Dunn, J. R. G. Edwards, Margaret Edwards, J. J. Elkeles, B. Ellenbogen, F. Fessler, E. Finsterbusch, Elizabeth H. Flett, L. P. R. Fourman, H. D. Freeth, B. Galandauer, R. M. Galvan, L. A. Gibbons, N. W. Gill, Kathleen M. Gillett, N. Glas, N. F. C. Gowing, E. A. Grau, C. Greenwood-Penny, K. E. A. U. Ground, T. E. Hall, R. C. Hallam, G. J. Hardaker, D. H. C. Harland, S. Harrison, H. G. Helm, G. W. D. Henderson, R. S. Henderson, P. R. Henson, E. Hesselberg, R. D. Hoare, A. Holmes-Smith, H. Howard-Swaffield, H. B. Hyman, J. B. Ingram, C. J. R. Jacob, H. M. Jones, H. H. Khan, R. A. B. Kinloch, H. G. S. Kerwin, W. S. S. Ladell, S. E. Large, J. B. Latto, R. R. Latto, T. E. Lamb, B. Lees, E. J. Leighton, H. M. Lewis, D. M. N. Longridge, T. H. McCall, J. G. McGavin, Lydia McMurdo, F. R. L. Makin, C. N. S. Manson, J. K. Martin, L. G. C. Martin, Margaret E. Matthews, J. Le F. Milburn, P. J. Miller, R. A. Moir, B. P. Moore, D. B. Morgan, A. B. Morrison, A. R. V. Moynagh, A. B. S. Mules, A. T. L. Norfolk, N. C. Norman, J. A. Oddie, Thora A. M. Oehlers, K. R. Ogilvie, L. J. Page, K. H. J. B. Parker, T. P. Pattinson, R. H. Percival, C. M. C. Potter, Dorothy P. Potter, B. S. Powell, G. C. Price, G. C. Purslow, P. A. B. Raffle, R. I. Randall, D. Ranger, J. Reiss, L. Rendell-Baker, J. L. Roberts, T. M. C. Roberts, P. J. Robinson, W. J. B. Rogers, M. S. Ross, B. Rowlatt, F. R. Russell, H. B. L. Russell, J. A. Sadler, R. G. Saipe, R. P. G. Sandon, R. D. W. Schofield, R. Sepson, P. C. Sharma, R. M. Sharpe, K. N. Sinha, P. A. J. Smith, R. A. G. Smith, T. H. S. Smith, C. C. Spicer, W. Spitzer, J. S. Stead, D. E. S. Steele, H. Sterndale, S. J. Sutton, J. H. Thompson, Edith M. Thorp, J. S. Tomkinson, S. E. Vincent, J. W. Warburton, R. S. Wathes, N. D. Wayne, Christine M. Weddell, D. N. White, Mary White, G. L. Whitmore, D. M. Wilkins, Betty M. Williams, J. Williams, M. H. Wostenholm, G. B. Wright, R. B. Wright.

Diplomas in Child Health were granted, jointly with the Royal College of Surgeons of England, to the nine candidates whose names were printed in the report of the meeting of the Royal College of Surgeons of England in the *Journal* of April 26 (p. 656).

D. W. Martin (*J. Pediat.*, 1940, **16**, 468) states that since 1935 eight cases of Rocky Mountain spotted fever in children have been treated at the Duke Hospital, Durham, N.C., as compared with only three cases in adults. Two were taken ill in June, four in July, and two in August—that is, during the season of greatest activity of the dog tick, by which the disease is transmitted. In five of the eight patients a history of tick bites was obtained, with the onset of symptoms from three to fourteen days later. The character of the disease varied from no symptoms except a rash and a temperature of 104° F. to delirium, coma, and a temperature of 105° F. The average duration of fever was fourteen days. Only one patient had a complication—gangrene of the nose. All recovered. The disease cannot be diagnosed from typhus by the Weil-Felix reaction, but can be differentiated by inoculation of guinea-pigs and biopsy of the skin lesion. Treatment is purely symptomatic. Although there are no reliable figures on the mortality of the disease in children, the mortality rate appears to be much lower than in adults, while the morbidity is much higher. As regards prevention, control on a large scale is impossible owing to the rapid rate of multiplication of the ticks and their extraordinary resistance. The vaccine prepared by the United States Public Health Service usually protects for a year and reduces the mortality, but its cost makes its widespread use impracticable.

Medical Notes in Parliament

Distribution of Medical Man-power

Responding to a request by Sir Henry Morris-Jones, Mr BROWN on April 24 gave the recommendations of the Committee on the distribution of medical man-power between the several civil and fighting Services and general medical practice. These were:

(i) All medical establishments, Service or civil, should be reviewed forthwith with a view to the fullest possible utilization of medical personnel and the reduction of future demands.

(ii) The services of civilian practitioners in proximity to troops might be further extended.

(iii) Where the three Services in this country are represented in the same or adjacent areas, further economy should be effected by the adoption of the principle of area service

(iv) The possibility of temporarily releasing practitioners from the Services for civilian work through the winter months when the demands of the civilian population are greatest should be carefully examined.

(v) The employment of alien practitioners admitted to the *Register* in civil hospitals and the Services should be further extended.

(vi) The employment of final-year students as house-surgeons or house-physicians in civil hospitals should be set on foot.

(vii) The question of the employment of more practitioners from the Dominion of Canada and other Dominions should be further explored.

(viii) The possibility of recruitment of practitioners from the United States of America is a new factor, and action in regard to it should be taken as quickly as possible.

(ix) An effective organization for the settlement of questions of priority should be established.

Medicine Stamp Duties Deputation

In the absence of Sir Francis Fremantle, Captain G. S. ELLISTON headed a deputation to Mr. Ernest Brown on April 22 on the Medicine Stamp Duties. Lord Horder, Lord Wolmer, Dr. Howitt, and Sir J. Graham Kerr were in this deputation. Its spokesmen pointed out that the removal of the duties would increase the advertisement, distribution, and display of proprietary remedies in small packets, encouraging self-medication in place of early treatment by medical practitioners or in the hospitals, sanatoria, and clinics provided by local authorities. Mr. BROWN promised careful consideration of the arguments of the deputation with a view to further discussion.

Disability and Deaths from Silicosis

On April 22 Mr. HERBERT MORRISON, replying to Mr. James Griffiths, issued the following table giving particulars of applications to the Silicosis Medical Board for certificates under the Various Industries (Silicosis) Schemes for Coalminers, 1940.

	Total	South Wales, excluding Anthracite Mines	Anthracite Mines
Disablement or Suspension:			
Number of applications for certificates..	957	353	472
Number of certificates granted:			
(i) Total disablement	185	91	71
(ii) Suspension (with partial incapacity)	282	78	189
Deaths:			
Number of applications for certificates..	137	84	32
Number certified as due to the disease ..	93	58	18

Shortage of Hospital Lay Staffs

Lord GREVILLE, in the House of Lords on April 23, asked what the Minister of Health was doing to see that the civilian staff of hospitals was made a reserved occupation. Staff, especially female staff, was being lost at such a rate that some wards in hospitals might have to be closed. The only people reserved apart from nurses and doctors were porters over 30, pharmacists at 25, and the assistant secretary at 30. The Minister of Health should approach the Minister of Labour. Among the many men and women now registering there should be categories unsuitable for munitions work, fire-fighting, and A.R.P., but willing to work in hospitals. If the Ministry of Health would draw attention to these vacancies in hospitals the services could probably be kept going.

Lord CROFT, in reply, said the Minister of Health had in mind the difficulties of hospitals in maintaining adequate male staffs. He kept in touch with the British Hospitals Association and the Ministry of Labour on the problem, but was bound to recognize that voluntary hospitals, equally with local authorities, must make their contribution of men to the Forces, and that both must employ women substitutes wherever possible. The Schedule of Reserved Occupations published just before Easter should allow ample time to train women substitutes or older men. By this Schedule hospital secretaries were reserved at 25 until Stage B was reached, when the reservation age was raised to 30, rising at Stage C to 35. For other administrative and clerical staff the age remained at 30 until Stage C, when it rose to 35. Individual cases of difficulty could still be considered on their merits. Similar consideration had been given to the subordinate grades. Hospital porters remained reserved at 30. Hospital orderlies were still reserved at the same age, and could only be recruited below it if required for similar work in the Forces. Lord Croft referred to the appeal made by Mr Brown on April 3 for women to come forward for nursing duties. The registration of young women with the Ministry of Labour would also be used so far as possible for meeting the needs of those hospitals that were particularly short of domestic staff. Arrangements had been made for the hospitals to notify their needs locally to employment exchange managers. Women already employed in hospitals would be encouraged to stay there.

E.M.S.: Private Houses as Hospitals

Mr. K. LINDSEY asked on April 24 how many private houses had been set aside for hospitals. Mr. BROWN replied that under arrangements agreed with the War Organization of the British Red Cross Society and the Order of St. John of Jerusalem, 163 houses had been opened with 8,454 beds, and fifty-two more were in preparation with 2,531 beds as auxiliary or convalescent hospitals for the Emergency Hospital Scheme. In these houses 2,795 beds were at present occupied. Instructions to bring more beds into use were being issued. The usefulness of these hospitals did not depend only on the present occupancy of beds. They were required for relieving the main hospitals of suitable types of patients as and when the pressure on beds developed. Twelve houses had also been opened with 683 beds, and forty-four were in preparation with 2,459 beds, as annexes to existing hospitals. The occupancy of beds in these was pooled with the parent hospitals, and separate figures could not be given. In addition 9 houses, capable of providing 850 beds, were included in the buildings marked as reserved hospitals for use only in a serious emergency. All these figures related only to the Emergency Hospital Scheme in England and Wales, and did not cover other hospitals not in the scheme which made arrangements of this kind privately or premises used as sick bays or minor infectious diseases hospitals. Certain other buildings besides private houses were used or have been marked for hospital purposes.

Employment of Alien Doctors

In a reply on April 24, Mr. JOHNSTON, Secretary for Scotland, said Circular No. 2315 authorized the employment of doctors of enemy alien nationality at hospitals and similar institutions where members of the Forces received treatment. Mr. Herbert Morrison concurred in the terms of that circular, and, together with the competent military authority where necessary, was consulted on each individual case. Mr. Brown had adopted the same policy and procedure. In view of the heavy demands now made on British practitioners, Mr. Johnston was satisfied that no restriction was required which would prevent alien doctors practising in protected areas or other places where members of the Forces received treatment.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The incidence of whooping-cough in England and Wales, generally throughout the country, showed a rise for the third consecutive week. This was mainly due to an increase in the prevalence of the disease in the urban areas. In Scotland the notifications showed a substantial decrease on the number for the preceding week. Fewer cases of diphtheria and scarlet fever were reported than in the preceding week, and in no area was there any violent fluctuation from the number of the previous week. The number of cases of cerebrospinal fever has been practically constant in England and Wales during the past four weeks, and no area has shown any considerable weekly variation. Two cases of typhus were recorded in Eire, from the rural district of Mohill, Co. Leitrim. The paratyphoid epidemic in the Highlands of Scotland is subsiding; the number of fresh cases reported during the week, 40, was less than half of the number notified during the preceding week.

Measles

The incidence of measles has risen considerably during the week under review, but the number of cases is below that recorded during some of the earlier weeks of the year. Compared with the previous week, increased notifications were recorded from Buckinghamshire, Essex, Gloucestershire, Lancashire, Lincolnshire, London, Suffolk, Surrey, Warwickshire, and Wiltshire. In the rural districts of Buckinghamshire the cases rose from 101 to 190; in Lincolnshire, Boston R.D., from 28 to 144; in Suffolk, Haverhill U.D., from 4 to 68; in Warwick, Birmingham C.B., from 396 to 593; in Wiltshire, Chippenham M.B., from 34 to 100. Contrary to the general experience of the country, the number of cases declined considerably in Dorset, from 349 to 182, and in Glamorganshire from 729 to 591—resulting from a fall in the incidence in urban areas. The increase in Scotland was due to the experience of Edinburgh and Glasgow, where 18 and 23 cases in excess of the preceding week were returned; but in Greenock a decrease of 26 occurred.

Dysentery

Although the total number of cases of dysentery was greater by 33 than that recorded in the preceding week, the general tendency was to a decline in incidence. The downward trend was disturbed by a violent outbreak in Hemel Hempstead, Herts, where 79 cases were reported for the first appearance of the disease in that area. This number was almost half the total recorded for the country. An investigation into the cause of this outbreak is proceeding, and all farms and dairies have been visited, as contaminated milk is suspected.

Trichiniasis

Rats have been found infected with the *Trichinella spiralis* in South Staffordshire, and the possibility of infection being spread by rats is being examined. Early in the year some 500 people were affected by this disease in Wolverhampton through, it is believed, eating raw sausage; but the actual source of infection was not established. There have been no fresh cases in the town during the past two months.

Typhus in Spain

Reports have been received that typhus fever is rife in several districts in Spain. The latest district to be affected is Algeciras.

Notifications of Infectious Diseases in England and Wales during the 26 weeks October–March, 1936-41

	1940–1	1939–40	1938–9	1937–8	1936–7
Cerebrospinal fever	6,138	5,432	734	721	588
Dysentery ..	2,902	1,130	1,007	5,451	644
Pneumonia ..	29,683	30,032	29,093	29,453	37,797
Diphtheria ..	31,608	21,451	32,754	41,970	32,149
Scarlet fever ..	38,647	30,284	45,995	63,406	48,411
Enteric fever ..	637	518	620	1,018	872
Totals expressed as a percentage of the mean of the three winters 1936–9					
Cerebrospinal fever	901	798	108	106	86
Dysentery ..	123	48	43	230	27
Pneumonia ..	92	94	91	92	118
Diphtheria ..	89	60	92	118	90
Scarlet fever ..	73	58	87	121	92
Enteric fever ..	76	62	74	122	104

A leading article on the incidence of epidemic diseases during the past winter appears at page 673.

No. 14

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended April 5, 1941.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	(b)	(c)	(d)	(e)	1940 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	335	19	81	3	7	436	38	86	4	5
Deaths		2	2				4	9		
Diphtheria	939	48	245	20	31	711	19	228	45	16
Deaths	36	—	7	1	1	15	—	5	1	1
Dysentery	173	5	30	1		48	8	34		1
Deaths			—	—	—			1	—	—
Encephalitis lethargica, acute	4	—	1	—	—	3	—	—	—	—
Deaths		—	—				—	1		
Enteric (typhoid and paratyphoid) fever	19	2	45	1	—	29	4	36	5	—
Deaths	1	—	—	—	—	—	—	—	—	—
Erysipelas			47	8	4			61	11	4
Deaths			—				—	—		
Infective enteritis or diarrhoea under 2 years	—									
Deaths	30	2	6	10	4	31	4	7	7	7
Measles	15971	396	156		8	4,069	55	58		217
Deaths	24	1	2	—	—	3	—	—	2	6
Ophthalmia neonatorum	76	2	10	—	—	92	9	60	4	—
Deaths										
Pneumonia, influenzal*	1,177	52	18	8	6	951	56	9	12	21
Deaths (from influenza)	70	3	7	3	7	102	15	8	5	5
Pneumonia, primary			436	15				250	13	
Deaths		35		8	7		40		14	26
Polio-encephalitis, acute	—	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	—	—	3	—	—	8	2	1	1	—
Deaths		—	—				—	—		
Puerperal fever	1	1	21			3	3	12		1
Deaths		—					—			
Puerperal pyrexia	111	5	10		1	141	11	8		—
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,137	67	131	39	31	841	36	138	32	68
Deaths	—	—	—	—	—	3	—	—	—	1
Small-pox	—	—	—		—	—	—	—		—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	2	—	—	—	—		—
Deaths			—	—	—			—	—	—
Whooping-cough	4,622	104	755		14	581	15	13		32
Deaths	36	1	22	—	—	3	—	—	1	—
Deaths (0-1 year)	414	19	133	33	25	442	40	94	29	43
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	5,207	620	859	211	191	5,564	912	766	216	205
Annual death rate (per 1,000 persons living)			18.7	14.0	16.7			13.9	14.4	18.0
Live births	4,890	372	924	366	254	7,009	1,103	944	386	242
Annual rate per 1,000 persons living			18.8	24.3	22.3			19.1	25.8	21.3
Stillbirths	207	11	37			310	57	35		
Rate per 1,000 total births (including stillborn)			39					36		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Medical News

The address of the Chief Inspector of Factories is now Queen Anne's Chambers, 28, Broadway, S.W.1.

At the annual meetings of the Golden Square and Central London Throat, Nose, and Ear Hospitals, held on April 23, Lord Erskine of Restormel stated from the chair that arrangements were well in hand for completing the legal formalities of the amalgamation of the two hospitals. The committee had been greatly encouraged by the King's permission for the combined institution to be called the Royal National Throat, Nose, and Ear Hospital.

In place of the annual dinner the Society of Radiographers held a luncheon on April 26, when a company of nearly one hundred assembled under the chairmanship of Mr. C. W. Furby. The proceedings were overshadowed by the recent death of Dr. G. W. C. Kaye, who had been president of the Society since 1937; and many tributes were paid to him at the gathering. In proposing the health of the Society, Lieut.-Colonel D. B. McGrigor, President of the British Institute of Radiology, congratulated radiographers on the work they were now doing in many spheres, civil and military, at home and abroad. Mr. Furby, the acting president, responding, said that the Society was now between 1,300 and 1,400 strong. He thanked Mr. F. Melville for his devoted work as secretary. Mr. Cuthbert Andrews, in proposing the health of "The Guests," said that they included representatives from the branches and allied societies and members of the *x*-ray services of the United States and Canada who were in this country. Major Boulton Myles, honorary secretary of the British Institute, said that he was in command of the R.A.M.C. School of Radiography, which was seeking to instil into the people concerned sufficient knowledge to enable them to make intelligent use of the *x*-ray apparatus being issued to the Army Medical Service, and he counted himself fortunate in being able to enlist the Society's co-operation in this respect.

On April 23 the American Ambassador handed to the chairman of the Women's Voluntary Services for Civil Defence three cheques totalling £70,250 as a gift from the American Red Cross Committee in Great Britain. Of this sum £20,000 will be used to establish thirty more nurseries for children under 5 years of age, including £5,000 to establish convalescent homes for bombed children who are not fit to go directly to the nurseries. The nurseries were started by the Women's Voluntary Services at the request of the Ministry of Health. There are already forty-six war nurseries, maintained by a grant of £20,000 from the American Red Cross. Every effort is made to send only normal healthy children to the nurseries. A further £50,000 is to be used in establishing seventy nursery centres at a cost of £700 each and £250 for play and instructional equipment for the existing nurseries. These nursery centres provide skilled attention for small groups of evacuated children during the daytime, giving them social training and occupation, a midday meal, medical supervision, and healthy surroundings.

Lord Horder has been elected president of the Cremation Society in succession to the late Duke of Bedford. He will continue to act as chairman of the council. Last year the number of cremations was 25,175.

Dr. Kenneth William Cripps Sinclair-Loutit, medical officer, A.R.P. Casualty Service, Finsbury, has been appointed an M.B.E. (Civil Division) for brave conduct in civil defence, and the names of Dr. John Balfour Allan and Dr. Herbert Beaton Giles, Casualty Service, Lincs (Kesteven), and Dr. James Macpherson, medical practitioner, Westminster, have been brought to notice for brave conduct in civil defence.

Dr. Alfred William Lumsden Smith has been nominated as a candidate for the Parliamentary constituency of King's Norton, Birmingham, rendered vacant by the death in action of Major J. R. H. Cartland. Dr. Lumsden Smith describes himself as an "independent reprisal candidate."

At the annual general meeting of the Royal Sanitary Institute the Earl of Bessborough was elected President in succession to Lord Balfour of Burleigh, whose period of office had expired.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Defect of Micturition

"EXILE" writes: The contrivance suggested by Dr. W. M. M. Jackson (September 7, 1940, p. 344) in response to the query of "Puzzled" (August 31, p. 306) may be avoidable. I am but 27 and have had this difficulty for as long as I can remember (diagnosis ?). Pressure over the bulb of the urethra, an unobtrusive manœuvre, should express these last few drops.

Income Tax

Use of House in Absence on Service

"J. H." is a partner in a firm of two; he is a bachelor, and a locumtenent is living in his house and carrying on his work. Can he deduct the whole of the cost of upkeep of the house or only the former one-third?

∴ The house presumably serves the purposes of storing his furniture, etc., and providing a place of residence for him as and when he can use it or return to it. A claim to deduct the whole is therefore not a valid one. On the other hand, that part which is being used for the personal accommodation of his employee (the locumtenent) is now being used for the purposes of the practice, and a larger proportion than formerly is due. We suggest that a claim for two-thirds would probably be a reasonable compromise.

Payment to Wife for Assistance

"COUNTRY DOCTOR" has paid his wife £52 a year for over twenty years, "as she acts as my secretary, does my books and accounts, and is a trained nurse and attends to accidents and dressings." No allowance for this was claimed until this year. Can he now claim for past years?

∴ Yes; a claim can now be made under the "error or mistake" provision (Finance Act, 1923, Section 24) for repayment of the excess tax paid for the five financial years 1934–5 to 1939–40. It will, however, be necessary to show that the £52 a year was paid to the wife *as remuneration for services*. In a case heard in the High Court in 1927 (Thompson v. Bruce) a refusal to admit a claim was upheld on the ground that there was no satisfactory evidence of such payments having been made.

LETTERS, NOTES, ETC.

Convulsions under Anaesthesia

DR. W. MATHEWS (Barrow-in-Furness) writes: The following account of a case of so-called ether convulsions may be of interest. Male, aged 31 years, suffering from perforated gangrenous appendicitis, which began sixty hours before operation. Before operation the temperature (mouth) was 100° F., general condition apart from the abdominal trouble was good; he had morphine, 1/4 grain, and atropine, 1/100 grain, thirty minutes before operation. The anaesthetic was chloroform and ether in the proportion of 1:3 (open mask), changed to pure chloroform fifteen minutes after the operation began. Half an hour after the start of the anaesthetic convulsions began, first in the face and extending in a few minutes to the whole body. The patient became very cyanosed, and oxygen in a high concentration was given for about five minutes, with relief of cyanosis, but convulsions were becoming more violent. Sodium evipan, 5 c.cm., was then given intravenously in about one minute with immediate cessation of the convulsions. The patient was returned to the ward, and recovery from the anaesthetic was normal. The temperature thirty minutes after operation was 102.4° (axilla).

The temperature of the theatre was 80° F. The anaesthetic was not an orthodox one, but I think it suggests that ether is not the cause of these convulsions.

Rotary Pump in Intravenous Therapy

Dr. R. N. HERSON (Middlesbrough) writes: All the advantages claimed by Mr. G. M. Arnott for Riddell's rotary pump (April 5, p. 517) can be equally well secured by a much cheaper and simpler device. If to his short bent tube which passes through the rubber bung of a wide-necked bottle a pair of bellows is attached, the siphonage can easily be started (provided that his straight inlet tube is dispensed with). The bottle is then raised a few feet above the vein. The bellows can be removed once the siphonage is established. As occasion arises the bellows are reapplied and a little more air is forced into the bottle to speed up a sluggish drip. A suitable pair of bellows will be found in most hospitals as part of the sigmoidoscopic equipment. For the rest, all that is required are a bottle, pieces of glass tubing, rubber tubing, a drip chamber, and a cork. Incidentally, this method has the advantage over Riddell's pump in that the same pair of bellows can be used to start and maintain several transfusions at the same time.

Local Treatment with Sulphonamides

We have received from Pharmaceutical Specialities (May and Baker) Ltd. a pamphlet entitled "The Prevention and Treatment of Infection in Wounds by Sulphonamides," which reviews present knowledge of the effects of introducing sulphonamide compounds directly into wounds: twenty-eight references are given to original papers. It is concluded that this practice has some preventive but no curative value, that it should be reinforced by oral administration, and that in wounds involving nervous tissue it should be avoided. A copy of this publication will be sent by Messrs. May and Baker to any medical practitioner on request.

The Future of Dentistry

Mr. J. E. BOOKER writes on behalf of the Joint Planning Committee of Dental Students (c/o National Dental Hospital, Great Portland Street, W.1): There has been a good deal of discussion recently within the medical profession with regard to the post-war adaptation of medical services to meet the best interests of the community under the new conditions which must inevitably arise. This problem has seriously presented itself to the students of the dental profession, and a Joint Students Committee, representative of all the London dental hospitals, and later, we hope, to include representatives of all the provincial hospitals, was formed some weeks ago and held its first meeting on March 13. The primary object of the committee's efforts is to further in post-war Britain the best ideals of public service, and with this end in view to equip the future dental practitioner with a detailed knowledge of both the good, and in particular the bad, conditions existing in modern dentistry. Already a comprehensive schedule, consisting of one hundred and ten items under five subdivisions, has been prepared, and this, we believe, covers all the major and associated problems confronting the dental profession. Dentistry, in common with medicine, is a vital public health service, and as such we feel that no effort should be spared in mobilizing the great scientific developments which have taken place since the early days of the profession in order that they may be made available to every class of the community. We feel that, for the complete accomplishment of our ideals, absolute co-operation is necessary between the dental and medical professions. Our own programme involves a great deal of self-criticism, and we would welcome any suggestions in the nature of co-operation which the medical profession may wish to make. For our part we shall be pleased to keep in touch with any similar movement to our own which may exist now or in the future within the medical profession with a view to free interchange of ideas and suggestions. Such co-operation between students of the two professions would do much to create a complete and mutual understanding of the paths along which each profession must tread in common and those from which a divergence is necessary by the special nature of the work involved. We would like to see such divergent paths eventually running parallel, with wide channels of communication through which could pass swiftly details of modern research and technique. The British Dental Association has been approached, and has expressed its approval of the proposed activities of the Students Joint Planning Committee.

Elastic Stockings

Dr. W. M. M. JACKSON writes: Elastic stockings should be made to measure and not purchased ready-made. Makers who advertise in the *Journal* have experienced fitters and can be relied upon for fit and quality. It is not necessary to purchase the more expensive qualities. Care should be taken to assure that the stocking is quite loose at its upper free border. It should be put on in the morning before rising. This is best done with the leg and thigh elevated at right-angles to the recumbent trunk; this position ensures emptied veins. In order to extend the durability and elasticity of the stockings, duplicates should always be ordered. By wearing on alternate days they have a rest of a day or more to dry and retain their shape. They last longer kept unexposed to light. I have found it comfortable and convenient to change them before dinner in the evening. They are, of course, removed when the wearer is in bed.

National Union of Students

Mr. P. A. H. RIVETT writes from the Leeds School of Medicine: I should like to correct any erroneous impressions which may have been created by the note in the *Journal* of April 12 (p. 578) referring to the decision of the Middlesex Hospital Common Room Society to withdraw from the National Union of Students on the grounds that the activities of the medical subcommittee of the union "no longer retained their non-political character." It has been a source of regret to the National Union that the Middlesex Hospital has never been a member, and has thereby been unable to voice its opinion at or to participate in the discussions and decisions of council, the governing body of the union. It has long been felt that this situation is to the disadvantage of both parties, in that the union is deprived of the contributions of Middlesex and the hospital is unable to share in the control and privileges of the union. As the hospital has never been a member, however, the decision to withdraw means less than nothing. With regard to the so-called "political activities" of the medical subcommittee, since the society does not even trouble to send observers to its meetings it is somewhat difficult to understand upon what grounds this extraordinary view is based; I am convinced that it is an ill-informed and hasty judgment, and I challenge the secretary or any other member of the society to advance any evidence to substantiate the opinion of the society.

*** This question cannot be discussed further in the *British Medical Journal*.

A Monthly Gift to the Medical War Relief Fund

"NORTH WALES" writes: I have already made one small contribution to this Fund, but a few days ago I thought of a plan which may prove useful to others of my colleagues. I propose to call on my bankers this week and ask them to make a monthly payment of one half-guinea towards the fund, so long as I can do so. I shall not miss it by giving it in this fashion and, being a lucky one in an evacuated area, consider I should do more; by a monthly subscription I am more likely to give a larger sum in the long run. I hope this method does not involve too much clerical work for the good fellows concerned.

Ration Meals

Ration Dinners, a booklet on the lines of the B.M.A.'s *Doctor's Cookery Book* but adapted to war needs, has just been published by the Central Council for Health Education. It has been approved by the Ministry of Food; the instructions are simple and the methods advised are up to date. Under each recipe quantities are given for a family of four and for a canteen of 100 people. The booklet is attractively printed and illustrated, and may be obtained in bulk from the council's offices, Tavistock House, Tavistock Square, W.C.1, or from booksellers at 2d. a copy.

A Children's Rest Centre

Miss ANNA FREUD writes: In your issue of March 29 (bottom of p. 491) you mentioned that I have "opened a clinic in Hampstead . . . etc." This statement seems to be based on a misunderstanding. The house in question is no *clinic* but a Children's Rest Centre—that is, a place where bombed-out babies and children can find a home under favourable conditions. I should be grateful if you could publish this explanation.

Injuries from Lightning

Dr. F. R. HUMPHREYS writes from Langley Terrace, Oakes, Huddersfield: I should be grateful to any of your readers who would be kind enough to send me details of any cases of injury to human beings from lightning. War conditions make it difficult to get information. The information will only be used for statistical purposes in connexion with the Thunderstorm Census Organization.

Corrigendum

Dr. JAMES REID wishes to point out that in his article "Prothrombin Deficiency in Disease of the Liver" (*Journal*, April 19, p. 579) the method of calculating the prothrombin index was incorrectly stated. It should have read:

$$\text{Prothrombin index} = \frac{\text{Control prothrombin time}}{\text{Unknown prothrombin time}} \times 100,$$

this being the reverse of the formula as given by him.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY MAY 3 1941

British Medical Association

PROCEEDINGS OF COUNCIL

Wednesday, April 23, 1941

A meeting of the Council of the Association was held at B.M.A. House, Tavistock Square, London, on April 23. Mr. H. S. SOUTTAR, Chairman of Council, presided, and about thirty members were present.

Personal and Preliminary

The Chairman mentioned with great regret the deaths of three former members of Council—Drs. H. S. Beadles, E. W. Lewis, and E. O. Turner. He also drew attention to the honours recently conferred by the King upon a number of members of the Association.

It was announced that owing to the pressure of other duties Dr. W. G. Willoughby had resigned from the Council. His resignation was received with great regret, and the Council gave instructions that a special letter of thanks should be sent to him for his services in many capacities.

The Chairman, with whom Dr. Dain and Dr. Bone were associated, gave notice that at the next meeting he would move that the Gold Medal of the Association be conferred upon Sir Kaye Le Fleming in recognition of his distinguished work for the Association and the profession.

Milk Restrictions

A communication from the Ministry of Food was before the Council stating that in view of the restriction of the supply of milk to domestic consumers the Ministry was anxious to ensure that milk supplies were available for sick persons in private households. To this end the Special Diets Committee of the Medical Research Council, which had been consulted, had advised that special provision should be made for the following diseases or conditions: active tuberculosis of all types and of all organized tissues; silicosis; conditions in which the patient is unable to swallow solid food by reason of an affection of the mouth, throat, or gullet; gastric, duodenal, or anastomotic ulcer; illnesses characterized by high and prolonged fever; and post-operative conditions after major operations. It was also stated that the statutory order which promulgated the restriction scheme would provide a prescribed form of medical certificate, the production of which by the householder would authorize the dairyman to supply the sick person with the quantity of milk recommended by the doctor, and that the doctor should obtain from the local Food Office copies of the form.

Several members of the Council expressed the view that the list of conditions for which special provision was made, while well enough so far as it went, was rather restricted. Reference was made in particular to the difficulty of old people in getting the necessary supply. It was suggested that a further category should be made consisting of exceptional cases in which, in the opinion of the doctor, an extra supply was desirable. It was also considered to place an unnecessary burden on the practitioner that he himself according to the terms of the order should be required to go to the Food Office for copies of the certificate. It was agreed that the Ministry of Food be made acquainted with the views of the Council on these and other points.

The Central Medical War Committee

Mr. Souttar, in presenting the report of the Central Medical War Committee, said that certain special committees had been appointed—namely, a Services Committee to deal with the recruitment of individual practitioners, under the chairmanship of Sir Alfred Webb-Johnson, together with a Young Practitioners Subcommittee to advise on the recruitment of young practitioners, under the chairmanship of Prof. Picken; an Advisory Emergency Hospital Medical Service Committee to consider questions relating to the E.M.S., under the chairmanship of Sir Robert Hutchison; and a Grading Committee, to determine the grading of practitioners to be recommended for employment as consultants and specialists in the Forces, under the chairmanship of Dr. J. C. Matthews.

The Association's Prizes, Scholarships, and Grants

Mr. Souttar said that the Executive Committee had considered the policy to be adopted in regard to the award of the Association's prizes, scholarships, and grants during the period of the present emergency. It recommended that the prizes and grants be not awarded during that period. The recommendation was agreed to.

It was announced that the Sir Charles Hastings Clinical Prize for 1941, which was offered before the above decision was considered, had been awarded to Dr. Eustace Pell Edmends of Aylesford, Kent, for an essay on "A Year's Survey of Psychoneuroses in General Practice." The thanks of the Council were accorded to the examiners (Colonel Gordon and Sir Humphry Rolleston).

Association Finance and the Journal

The Treasurer (Dr. Bone) presented the Balance Sheet and Financial Statement appended to the Annual Report of Council. He said that one of the outstanding facts in the statement of accounts was that the *Journal* had been produced at a much lower cost than in the previous year. The result reflected great credit on the Board of Directors and on the editorial and administrative staffs.

Colonel R. G. Gordon, chairman of the Board of Directors, said he was sure the Council would like to thank the staff of the *Journal* for the extremely good work they had done under very difficult circumstances and also to welcome back the Editor. During his long absence at the close of last year Dr. Clegg, Deputy Editor, and Miss Hollowell, Subeditor, had done excellent work and had maintained the *Journal* at a very high standard. The Advertisement Manager also deserved congratulation on the fact that the revenue from advertisements had increased although the number of pages had been cut down very considerably. The printers deserved commendation for having carried on in the face of great difficulties. Colonel Gordon added that although the paper situation was difficult there was every hope of keeping the *Journal* at or about its present size, and every effort would be made to maintain its interest and topicality. The special journals had also come out very satisfactorily in the accounts.

The Medical Planning Commission and General Practitioners

Dr. E. A. Gregg reported that the Insurance Acts Committee had had under consideration representations made by a large number of panel committees for an increase in the proportion of general practitioners represented on the Medical Planning Commission. It had been decided to ask the Commission to agree to an increase in the number of urban and rural general practitioners on that body. It was also reported

that resolutions had been received from a number of panel committees and Divisions urging more direct representation of general practitioners.

Dr. Wand said that the amount of feeling on this subject in the country was very great, and he was sure that if the Council could see its way to endorse the action of the Insurance Acts Committee it would do a great deal of good. General practitioners were sore because, while the Royal Colleges had a direct representation of consultants, the general practitioners, though some of their number were on the Commission, had no such direct representation.

The Chairman of Council said that he would be glad to see the Insurance Acts Committee's proposal placed before the Commission. Dr. Waterfield said that the Council hardly realized the amount of feeling on this subject in the country. Various matters such as the failure to secure a higher capitation fee for insurance practitioners and the refusal of the Ministry to take into account increasing costs all reacted on the feeling of general practitioners. In the past members had had the opportunity at the Annual Representative Meeting and the Panel Conference of expressing their views, but this was denied them at present, and therefore they were passing resolutions at panel committee meetings and writing letters to the *Journal*.

Mr. Bishop Harman said that it was not desirable to enlarge the Commission, but he thought the Insurance Acts Committee might itself be regarded as a committee of the Commission within its particular province. Dr. Dain thought that the Council could hardly go back on the arrangements already made. The Association had with some difficulty secured a lead in this matter, and it was desirable that nothing should be done to imperil it. Colonel Proctor associated himself with what Dr. Wand had said, not only because the Division of which he was chairman had asked him to emphasize their point of view, but because at a meeting of the whole profession in his area, which was called to elect the Local Medical War Committee, the opportunity was taken of ventilating this grievance.

The Secretary, who addressed the Council by invitation, said that in view of the decision already taken with regard to the size of the Commission it would be very unwise to go back upon it, but it could be safely left to the chairman of the Insurance Acts Committee, who was himself a member, and to Dr. Dain and others to put forward to the Commission at its first meeting next month the point of view which had been expressed in the Council.

The Council adopted the report of the Insurance Acts Committee embodying the statement that the committee had decided to ask the Commission to agree to an increase in the number of general practitioners, and it was left to those members of the Council who were on the Commission and to the Officers of the Association to see what could be done when the meeting was held.

Mr. Souttar, speaking for the Executive Committee, said that consideration had been given to the question of holding a Representative Meeting during the present year, but it was decided that such a course was neither advisable nor desirable at the present juncture.

Prof. Picken said that while he agreed that an Annual Representative Meeting in the ordinary sense should not be held, it was very important that at a time when there was a certain amount of unrest among the general body of members a middle course should be taken. There was a good deal to be said for holding at the time of the statutory Annual General Meeting in July a special meeting or conference of representatives of Home Divisions at which there might be submitted the Annual Report of Council and any such agenda as the office might consider desirable. He hoped also that the publication of the Annual Report of Council would not be much curtailed. It was essential to convey to the Divisions and the general body of members throughout the country all that Council and headquarters were doing at the present time.

Dr. Peter Macdonald associated himself with the suggestion for holding a conference, and the Chairman of Council said that in fact this matter was at present under consideration by the Executive Committee and he hoped that it would be possible to carry it into effect.

Increase in Private Fees Recommended

Dr. Bone, reporting in the absence of Dr. Pooler for the General Practice Executive Committee, said that a few Divisions had recommended their members to increase their private fees in view of the rising costs incurred in medical practice, and the committee had considered whether the time had arrived for making a central recommendation on those lines. He moved accordingly:

> That an increase of fees has been rendered inevitable by rising costs, and that practitioners in general practice be recommended to increase their private fees, including contract fees, by not less than 20%.

He said that this followed the precedent made during the last war. The recommendation was agreed to.

Dr. Bone mentioned that the committee had for some time been in communication with the Ministry of Pensions in an endeavour to persuade the Ministry to increase the fees payable to practitioners acting as medical officers on the Ministry's medical boards. The Ministry of Pensions could not agree to the increase requested by the Association, but it had given authority for a certain upward revision. The committee was now asking the Ministry to discuss the position with representatives from the Association.

In response to a request for advice the committee had recommended that a fee of 5s. be paid for the examination of bus conductresses; also that the same amount be paid to the certifying factory surgeon for certificates of medical unfitness in the case of workmen who had been ordered to remove to areas away from their homes to take up work of national importance.

Scotland and Ireland

Dr. J. B. Miller presented a report from the Scottish Committee. He said that most of the counties of Scotland and the larger burghs were working the Maternity Services (Scotland) Act, 1937. He also reported that consultations had taken place between representatives of the Royal Infirmary, Edinburgh, and of the Edinburgh and South-East Scotland Branch of the Association, together with the Scottish Secretary, regarding the use of out-patient departments in the hospital. As a result a lengthy minute of eight clauses had been adopted by the Board of Managers of the hospital setting out the function of the out-patient department, and it had been agreed that the City of Edinburgh Division should notify the position to the practitioners in the area.

Dr. Peter Macdonald congratulated the Scottish Committee on an excellent piece of work in getting this statement of the functions of out-patient departments agreed, and Dr. Bone added his congratulations, saying that this terse and definitive statement might well be commended to the Medical Planning Commission when it was considering this subject.

Dr. David Gray, president of the Northern Ireland Branch, was nominated to represent the Association on the tribunal set up by the Ministry for Home Affairs in accordance with the first schedule of the Dangerous Drugs Regulations.

Other Business

A highly satisfactory report was received from the Medical Propaganda Committee. It was stated that the editors of forty British medical and related periodicals were assisting the British medical information service by sending their journals regularly for abstracts, and that batches of abstracts were being sent to periodicals in the Spanish language in Spain and in Central and South American countries.

The General Practice Executive Committee reported that the long night raids had caused some difficulty in assessing the fee to be paid to a practitioner called out for duty at a first-aid post for a period extending over midnight. The fee had been fixed at 1½ guineas for a session of not more than two hours and 3 guineas for a session of more than two hours, with a maximum of 3 guineas for any one day. The Ministry of Health's proposal to define "any one day" as the period from midnight to midnight had been accepted, anything less than one hour's attendance on either side of midnight not being reckoned as entitling the practitioner to a fresh day's sessional fee.

Routine reports were presented from the Industrial Health Committee and the Charities Committee, and the Annual Report of Council was approved for publication

MEDICAL WAR RELIEF FUND

FIFTEENTH LIST

Previously acknowledged £21,163 18s. 2d. and £100 3½% Conversion Stock

Individual Subscriptions

£25.—Dr. Walter S. A. Griffith, London; Sir Thomas Barlow, Aylesbury (2nd donation).

£10 10s.—Dr. G. E. Bellamy, Dover; Mr. D. Chamberlain, Leeds; Dr. V. B. Green-Armytage, London; Drs. Hills and Mould, Stroud, Glos.; Dr. A. McMillan, New Romney; Dr. A. W. Weston, Dudley; Anonymous; "Fortis Atque Fidelis"; Dr. and Mrs. H. Read, Long Sutton; Dr. L. Thomas, Halifax, N.S.

£10.—Major W. Bligh, Bournemouth; Drs. Baxter and Geldard, Teddington Dr. J. R. Debbin, Bury St. Edmunds; Mr. L. Colledge, London.

£7 10s.—Dr. S. E. Gill, Hove.

£5 5s.—Dr. E. Clements, Middleton-on-the-Wolds; Dr. O. Gray, Haslemere; Dr. R. A. Greenwood, Sheffield; Dr. H. B. Lewers, Ilfracombe; Dr. A. Y. Milne, Ashford, Kent; Dr. T. F. Moran, Middlesbrough; Surgeon Rear-Admiral W. H. S. Stallkartt, Cosham; Mr. G. H. Steele, Guildford; Dr. G. W. R. Thomson, Ripley; Dr. P. H. J. Turton, Nottingham, "Third Chip". Dr. G. Dudley, Stourbridge; Dr. A. C. Geodwin, Dawlish; Dr D. Macfarlane, Derby; Dr. H. Gordon Smith, Banff.

£5.—Dr. R. D. Attwood, Royston; Dr. W. Edwards, Ashtead. Dr. J B Lowe, Bor (2nd donation); Maj. M. C. E. Constantine, Devonport. Mr E. Deanesley, Merioneth; Mrs. Richardson, M.D., Prestbury. Dr O F Sydenham, Crewe.

£3 3s.—Drs. J. C. and W. A. Heal, Exeter. Dr. G. Holloway, Bourne. Dr T. M. Hughes, Altrincham; Captain R. P. Robertson, Canterbury. Dr. P Ross, London; Dr. C. Vipont Brown, Manchester; Dr. P. C Mackenzie, Andover.

£2 2s.—Dr. K. Atteridge, York; Dr. S. C. H. Bent, London. Dr. A. Plewman Brown, Ebbw Vale; Dr. E. M. Clarke, Nottingham; Dr. H. Dodgson, Brighton Dr. E. C. Evans, London; Dr. G. R. Footner, St. Ives, Cornwall; Dr. J. T. M. Giffen, Chester; Dr. K. M. Greer, Leicester; Dr. J. A. Henry, Hurstpierpoint; Miss M. R. Herford, Chester; Dr. W. D. Hoskins, Luton; Dr. Margaret Jackson, Aylesbury. Dr. E. F. Kenny, Leeds; Dr. F. L. Nichol, Oxford (2nd donation); Dr. J. M. Petrie, Elgin; Dr. R. Sanderson, Lancing; Dr. G. A. G. Simpson, Oxford; Dr. W. N. Simpson, Midlothian; Dr. C. S. Sterrs, Helston; Dr. Grace A. Austin, West Bridgford; Dr. A. Pring Farmer, Sudan; Dr. R. E. V. Hale, Harpenden; Mr. A. C. Miller, Blackpool; Dr. A. R. G. Pocock, London; Dr. G. M. Rolfe, Exeter; Dr. W. H. Steele, Newton Abbot; Dr G. M. Stirling, Fife; Lt.-Col. T. G. N. Stokes, I.M.S., Ret., Budleigh Salterton; Dr. H. Taylor, London.

£2.—Dr. J. Bramley-Moore, Newton Abbot; Dr. R. H. Fagge, Melton Mowbray; Dr. W. Davidson, Kilbarchan.

£1 1s.—Dr. G. F. Barran, Denbigh; Dr. F. R. Corfe, Petersfield; Dr. S. K. Drainer, Dumfries. Dr. A. Finegan, Eire; Captain F. R. Gedye, Ipswich; Dr. C. J. Girling, Wallingsford (2nd donation); Dr. F. Grenier, Brixham; Mr. T. Guthrie, Pembury; Dr. M. C. G. Israëls, Manchester; Dr. W. King, Manchester; Dr. G. L. Ormerod, Bristol; Dr. A. I. Steyn, Portsmouth; Dr. C. L. Traylen, London; Dr. S. A. Underwood, York; Dr. W. Watson, Radcliffe-on-Trent; Dr. J. F. D. Willoughby, Southwell; Dr. R. I. T. Dunnachie, Glasgow; Mrs. S. Glaser, Malmesbury; Dr. C. Harris, Brighton; Mrs. K. C. Mackenzie, Andover; Dr. A. H. Nicoll, London; Dr. H. K. V. Soltau, Bristol; Dr. J. Watson, Sutherland.

£1.—Mr. W. W. Jeudwine, Eastcote; Dr. M. V. Menon, Manchester; Dr. A. Blumfeld, Northenden.

10s. 6d.—Dr. B. Scher, London; Mrs. R. S. Walker, Argyll.

7s. 6d.—Dr. J. Raymond, Burnley.

£291 1s. 7d.—Practitioners in the area of the Cambridge and Huntingdon Division—per Dr. Youngman: Dr. H. R. Youngman, £20; Dr. A. I. Roughton, £5; Dr. J. H. C. Dalton, £5; Dr. W. B. Gourlay, 10s.; Dr. M. S. Doubble, £2 2s.; Dr. M. G. P. Reed, £10 10s.; Dr. Wilson, £3 3s.; Dr. G. S. Haynes, £5 5s.; Dr. A. J. Laird, £1 1s.; Dr. Robson, £10; Dr. L. G. Davies, £5; Dr. C. H. Whittle, £10 10s.; Dr. J. F. Maxwell, £10; Dr. J. Y. Laidlaw, £10; Dr. C. M. Stevenson, £10 10s.; Dr. H. C. C. Veitch, £5 5s.; Dr. W. Garde-Browne, £1 1s.; Dr. A. W. C. Drake, £2 2s.; Dr. Ellis, £1 1s.; Dr. G. F. Rogers, £5; Dr. H. Richards, £1 1s.; Dr. R. French, £2 2s.; Dr. J. R. Garrood, £3 17s. 11d.; Dr. J. Cooper, £5 5s.; Dr. G. J. Allan, 10s.; Dr. J. S. Mitchell, £10 10s.; Dr. A. Brown, £2 2s.; Dr. G. Drummond Robinson, £2 2s.; Dr. W. R. Grove, £5; Dr. P. H. R. Ghey, £2 2s.; Dr. A. Greenwood, £5 5s.; Dr. W. H. Bowen, £10; Dr. H. T. Jones, £5; Dr. F. Robinson, £3 3s.; Dr. F. H. Stewart, £10 10s.; Dr. W. A. H. Rushton, £5; Dr. H. C. Nielson, £2 2s.; Dr. M. C. K. Patterson, £2 2s.; Dr. A. E. Staffurth, £5 5s.; Dr. P. H. Dudley, £10 10s.; Dr. C. B. Moss-Blundell, £2 2s.; Dr. A. P. Taylor, £20; Dr. Thomas, £2 2s.; Dr. G. Graham-Smith £1; Dr. F. M. Deighton, £1 1s.; Dr. F. B. Parsons, £10 10s.; Dr. V. C. Pennell, £5 5s.; Dr. J. N. Vaughan, £1 1s.; Dr. K. Silberstein, 10s. 6d.; Dr. H. E. Nourse, £10; Drs. York Moore and Treweek, £2 2s.; Dr. H. E. Durham, £10; Dr. W. S. Grove, £2 2s.; Prof. E. D. Adrian, £10. (The cost of collection was £3 2s. 10d.).

£135 2s.—Per Dr. Hollis, Hon. Secretary, Leeds Panel Committee (amount already sent, £107 2s.): Leeds L.M. and P.C., £50 (already acknowledged): Dr. E. Thompson, £3; Dr. H. B. Cook, £5; Dr. C. W. Ward, 10s. 6d.; Dr. A. R. Roche, £1 1s.; Dr. V. R. Thornton, £5 5s.; Dr. J. J. Jervis, £2 2s.; Mr. A. B. Paine, £5; Dr. C. G. K. Sharp, £2 2s.; Dr. F. F. Hellier, £5 5s.; Dr. J. T. Ingram, £5 5s. (2nd donation); Prof. M. J. Stewart, £5 5s.; Dr. J. Forbes, £1 1s.; Dr. D. Yates, £1 1s. (2nd donation); Dr. L. C. Lodge, £5 5s.; Dr. A. E. Huxtable, £1 1s.; Dr. G. M. Thomas, £1 1s.; Dr. B. Wheatley, £1 1s.; Dr. H. Bailey, £2 2s.; Dr. G. P. Anning, £2 2s.; Mr. and Mrs. H. W. Symons, £10 10s.; Dr. G. W. Watson, £3 3s.; Dr. R. E. Tunbridge, £5; Dr. R. A. Veale, £2 2s.; Dr. G. Harrison, £2 2s.; Dr. M. L. Gaunt, £2 2s.; Dr. A. U. Mackinnon, £2 2s.; Dr. M. Masser, £1 1s.; Dr. G. M. Bonser, £2 2s.; Dr. W. Warnock, £10 (2nd donation); Dr. A. A. Driver, 10s. 6d.; Dr. E. C. Bean, £3 3s.; Dr. A. Dennis, £1 1s.; Dr. H. Towers, £2 2s.; Dr. N. Rumbold, £1 1s.; Dr. A. F. Shirras, £10 10s.; Dr. E. B. Sykes, £2 2s.; Dr. A. A. Roberts, £1 1s.; Dr. J. Acomb, £1 1s.; Dr. J. C. G. Anderton, £2 2s.; Dr. F. Anderson, £1 1s. (2nd donation); Dr. J. Vaughan Jones, £3 3s. (2nd donation); Dr. Marian Jones, £2 2s.; Dr. R. C. Jamison, £2 2s.; Dr. G. Gorstage, £5 5s.; Dr. C. E. Mathieson, £2 2s.

£125.—Practitioners in the Stockport Division area—per Dr. F. W. Schofield: Dr. H. G. S. Anderson, Dr. J. V. O. Andrew, Dr. J. P. Arlard, Dr. J. T. Bailey, Dr. H. W. Bennett, Dr. Muriel Bennett, Drs. A. W. Berry and J. F. Crabtree, Mr. N. W. Bolton, Dr. A. Boyle, Drs. W. H. Broughton, Drs. W. Shankland and W. Ross Martyn, Dr. J. Brown, Dr. F. Chadwick, Dr. J. Clancy, Dr. P. Coakley, Dr. Mary A. C. Cowell, Dr. F. Dallimore, Dr. R. A. Famous, Dr. H. Fay, Dr. R. Findlay, Dr. E. Fullerton, Dr. D. G. Gellatley, Dr. E. Greenhalgh (2nd donation), Dr. P. Gregory, Dr. R. Heathcote, Dr. C. Hibbert, Dr. H. Hirsch, Dr. May Johnson, Dr. Lois Kippen, Dr. F. J. Kitt, Dr. R. Lakin, Dr. D. C. McCarthy, Dr. A. M. MacGill, Dr. H. Mackenzie, Dr. G. A. Main, Dr. L. M. E. Milne, Dr. A. Model, Dr. A. R. M. Moir, Dr. C. A. S. Mulligan, Dr. D. Renton, Dr. W. H. Rowell, Dr. F. W. Schofield, Dr. M. V. Shanahan, Dr. J. S. Taggart, Dr. C. H. Thompson, Dr. W. M. Thomsen, Dr. R. H. Titcombe, Dr. C. B. V. Walker, Dr. B Walley, Dr. Josephine Walmsley, Dr. J. F. Williamson, Dr. R. M. Wilson, Dr. M. A. Wiseman, Dr. J. A. D. Wyness, Dr. J. Yule.

£106 15s.—Practitioners in the area of the Marylebone Division—per Mr. F MacG. Loughnane: Mr. V. Zachary Cope, £5 5s. (2nd donation); Mr. A. M. A. Moore, £3 3s.; Dr. T. H. Bishop, £2 2s.; Dr. A. M. Mitchell, £1 1s.; Dr. W. N. Goldsmith, £1; Dr. S. Sunderland, £1; Dr. L. Mandel £2 2s.; Mr. M. Whiting, £5 5s.; Dr. Z. A. Leitner, £2 2s.; Dr. Ellis Stango, £3 3s.; Mr. and Mrs. John Hunter, £5; Mr. G. T. Mullally, £3 3s.; Dr. G. Riddoch, £5 5s.; Dr. R. Klaber, £1 1s.; Mr. G. F. G. Batchelor, £1 1s.; Dr. A. A. Parson, £5; Dr. I. Muende, £2 2s.; Dr. M. Lowenfeld, £1 1s.; Dr. R. Carter, 10s.; Mr. Russell Howard, £5 5s.; Dr. H. L. Wilson, 5s.; Dr. F. Price, £10 10s.; Dr. C. A. King, £1 1s.; Dr. R. Cove-Smith, £3 3s.; Dr T. G. Pearson, £10; Dr. A. H. Douthwaite, £2 2s.; Dr H. A. Bulman, £2 2s.; Dr D. Paterson, £3 3s.; Dr. L. P. de Costobadie, £1 1s.; Dr S. C. Lewsen, £5 5s.; Dr. G. M. Tierney, £2 2s; Dr E. Honigsberger, £1 1s.; Dr. F. M. Neild, £3 3s.; Dr. A. W Spence, £3 3s.; Mr. F. M. Loughnane, £3 3s.

£84.—Surrey Insurance Practitioners—per Dr. A. Lynden (amount already sent £181 1s.).

£70 3s.—Per Dr. D. O'Driscoll, Hon. Secretary, Blackburn Division. Dr. W Briggs, £2 2s.; Dr. W. Brock, £2 2s.; Dr. E. L. Compston, £2 2s.; Dr. J. S Cooper, £5 5s.; Dr. W. L. Devlin, £2 2s.; Dr. F. E. Edwards, £2 2s.; Dr. F. J. Greeves, £2 2s.; Dr. A. Hargreaves, £2 2s.; Dr. C. Y. Howarth, £2 2s., Mr. A. Innes, £2 2s.; Dr. D. Kelleher, £2 2s.; Dr. W. Kelly, £2 2s.; Drs. A. and J. B. Leigh, £6 6s.; Dr. J. W. Lyall, £2 2s.; Dr. J. McDonald, £2 2s.; Dr. N. F. McKenzie, £2 2s.; Dr. D. O'Driscoll, £3 3s.; Mr C. M. Pearce, £2 2s.; Dr. R. Porteous, £2 2s.; Dr. R. Pendlebury, £2 2s.; Dr. P. N. Rampal, £1 1s.; Dr. R. S. Russon, £2 2s., Dr. G. S. Robertson, £2 2s.; Dr F. C. Simpson, £2 2s.; Dr. W. Steel, £5; Dr. R. W. Valentine, £2 2s.; Dr R. C. U. Warrington, £3 3s.; Dr. J. M. Wishart, £2 2s.; Dr. P Zimmerman £1 1s. (The cost of collection was £1.)

£57 9s. 9d.—Practitioners in the area of North Northumberland Division—per Hon. Secretary: Dr. V. E. Baddock, £4 4s.; Dr. A. N. Bousfield, £2 2s.; Dr. R. H. Dewar, £2 2s.; Dr. J. R. Hewat-Jaboor, £1 1s.; Dr. F. B. Macaskie, £2 2s.; Dr. D. T. McDonald, £2 2s. (2nd donation); Dr. J. McDonald, £6 6s.; Dr. W. M. P. McDonald, £4 4s.; Dr. J. C. MacKay, £2 2s.; Dr. P. W. Maclean, £2; Dr. J. A. Macleod, £3 3s.; Dr. H. F. Park, £1 1; Dr. Scott Purves, £2 2s.; Dr. W. G. Scott, £3 3s.; Dr. W. R. Spruit, £2; Dr. B. E. A. Trevor-Roper, £2 2s.; Dr. J. G. Mackaskie, £1 1s.; Dr. J. C. D. Mitchell, £1 1s.; Col. H. Morton, £1 1s.; Dr. R. E. Moyes, £5 5s.; Dr. Anna Reid, £1 1s.; Dr. J. A. Small, £5 5s.; Dr. R. S. Small, £1 1s.; Dr E. A. Welsh, £1 1s. (The cost of collection was £1 1s. 3d.)

£44 11s.—Per Dr. J. Hunter, City of Edinburgh Division (amount already sent, £162 2s.): Dr. R. E. Allison, £1; Dr. L. G. Rose, £1 1s.; Dr. F. Stevenson, £1 1s.; Lt.-Col. A. D. Stewart, £1; Dr. G. W. Simpson, £2 2s.; Dr. Wilhelmina J. Barrie, £1; Dr. A. M. M. Hunter, £2 2s.; Dr E. F. Dott, £1 1s.; Dr. J. L. M. Lamont, £5 5s.; Mr. W. W. Carlow, £3 3s.; Dr. J. C. McKenzie, £1 1s.; Dr. Sheila Hunter, £1; Dr. A. C. Watt, £5; Dr. A. S. Silver, £1 1s.; Lt. Col. H. Innes, £1 1s.; Dr. J. N. Stark, £1; Dr. M. Murrell, £2 2s.; Dr. M. M. Gavin, £1 1s.; Dr. W. McFarlane, £2 2s.; Dr. J. H. Beveridge, £3 3s.; Dr. G. D. Rowarth, £1; Dr. T. R. R. Todd, £3 3s.; S.E. Association, Medical Women's Federation, £2 2s.; Dr. John Hunter, £1.

£43 15s.—Practitioners in the area of the Hampstead Division—per Mr. S. Boyd: Dr. A. Thomas, £5 5s.; Dr. J. Kennedy, £1 1s.; Dr. I. Brock, £3; Dr. M. W. Geffen, £1 1s.; Dr N. Sprott, £1 1s. Dr I. Feldman, £5 5s.; Dr. E. A. Seymour, £2 2s.; Dr. H. S. Joseph, £1 1s.; Dr R. Procter, £1; Lt.-Col. W. B. Lane, 10s.; Sir Leonard Rogers, £2; Dr. A. C. Rotburgh, £2 2s.; Dr. A. E. Ellis, £1 1s.; Dr. C. W. Morris, £2 2s., Dr O. Plowright, £2; Dr. M. L. Rosenheim, £2 2s.; Dr O. L. Theobalds, £3 3s.; Dr. M. Drew, £1 1s.; Dr. D. W. Winnicott, £2 2s.; Dr. H. Avery, £2 2s.; Dr. G. W. Charney, £1 1s.; Miss M. Basden, £2 2s.; Dr. P. Gamham, £1 1s.; Mr. S. Boyd, £3 3s. (The cost of collection was £4 13s.)

£42.—Medical Staff of Royal Isle of Wight County Hospital—per Dr. L. Firman-Edwards.

£32 11s.—Per Dr. J. A. L. Johnston, Hon. Secretary, Londonderry Division: Dr. F. Richards; Dr. J. A. Acheson; Dr. S. E. Bolton; Dr. D. Cavanagh; Dr. J. Henderson; Dr. J. A. L. Johnston; Dr. J. W. Killen; Dr. A. Kinkella; Dr. M. F. Leslie; Dr. J Watson.

£30 9s.—Per Dr. Blaser-Smith, Ashton-under-Lyne L.M.W.C. (amount already sent £65 2s.): Dr. W. J Poole, £2 2s.; Dr. W. R. Robertson, £4 4s.; Dr. H. Elkington Smith, £5 5s.; Dr. C. Lovering, £4 4s.; Dr. J. E. R. Keyms, £3 3s.; Dr. W. K. Spencer, £2 2s.; Dr. F. I. Firth, £2 2s.; Dr. C. H. Spencer, £3 3s.; Dr. B. Bowman, £4 4s.

£25 7s.—Practitioners in Buckinghamshire—per Dr. R. W. McConnel (amount already sent £223 7s.): Dr. T. L. Kennish, £5; Dr. G. N. Edwards, £2; Sir John Broadbent, £2 2s. (2nd donation); Dr. M. Ward, £2 2s.; Dr. R. N. Goodman, £10; Maj.-Gen. A. Hooton, £1; Dr. S. R. Tattersall, £3 3s.

£24 5s.—Practitioners in the Bolton Division—per Dr. H. W Bowyer (amount already sent, £20 14s.): Dr. R. Beesley, £1 1s.; Dr. J. Morrison, £2 2s.; Dr. D. Gray, £10; Dr. J. Thornley, £5; Dr. Jean Marshall, £4 (2nd donation); Dr. J. Scott, £2 2s.

£19.—Per Dr. G. F. Wilson, Stratford Division.

£18 8s. 10d.—Practitioners in the area of the Dumbartonshire Division—(amount already sent, £55 12s. 9d.): Dr. S. J. Henderson, £3 3s.; Dr. H. Scott, £1 1s.; Dr. A. S. Henderson, £15 15s. (The cost of collection was £1 10s. 2d.)

£18 8s.—Doctors in the Isle of Man—per Dr. D Pantin (amount already sent, £25 14s.): Dr. L. Woods, £5 5s.; Dr. R. H. Peyser, £5; Dr. D. Pantin, £3 3s. (2nd donation); Dr. L. H. Skene, £5.

£16.—Per Dr. Mabel Ramsay, Plymouth (amount already sent, £230 4s. 6d.): Dr. D. McNair, £5; Dr. H. C. C. Reid, £1 (5th donation); Dr. Colin D. Lindsay, £10 (2nd donation).

£15 15s.—Northamptonshire Medical Charity—per Dr. D. G. Greenfield (amount already sent, £459 13s. 6d.): Dr. A. G. Eld, £3 3s.; Dr. J. Barrett, £3 3s.; Dr. J. P. Traylen, £2 2s.; Dr. W. Stanley, £5 5s.; Dr. H. E. C. Aslett, £2 2s.

£12 7s.—Staffordshire Insurance Practitioners—per Hon. Secretary, Staffs Panel Committee (amount already sent, £588 10s. 11d.): Dr. O. W. R. Tomkinson, £5; Dr. Bakeena and Cunningham, £7 7s.

£11 10s.—Practitioners in area of Doncaster Division: Dr. J. Malloch, £3 3s.; Dr. L. Dougal Callander, £2 2s.; Dr. C. D. Halloran, £2 2s.; Dr. W. B. Burke, £1 1s.; Dr. D. T. Clark, £1; Mr. M. D. Thakere, £2 2s.

£10 10s.—York Medical Society—per Dr. E. S. Vergette.

£9 9s.—Per Dr. E. H. Deam, Hon. Secretary, East Yorkshire Branch (amount already sent, £97 7s.): Dr. W. W. Adamson, £2 2s.; Dr. J. L. Egan, £2 2s.; Dr. P. Spence, £5 5s. Practitioners in the area of the City of Aberdeen Division—per Dr. Middleton Connon and Dr. D. W. Berry, Hon. Secretaries (amount already sent, £133 4s.): Dr. P. Howie, £2 2s.; Dr. A. F. Pringle, £2 2s.; Dr.

J. A. Innes. £2 2s. ; Dr. G. S. Banks, £1 1s. : Drs. J. W. and J. Gertrude Craig: £2 2s.

£8 18s.—Paisley Insurance Practitioners—per Secretary, Paisley Panel Committee . Dr. I. H. McNeil. £2 2s. ; Dr. A. C. Richmond, £2 2s. ; Dr. M. Allison, £1 1s. ; Dr. A. E. Struthers, £1 1s. : Dr. J. S. Dale. £1 1s. : Dr. R. Cochran, £1 1s. ; Dr T. A Haslett, 10s.

£6 2s.—Per Col. J. S. Dunne, Welwyn (amount already sent, £5 8s.) : Dr. E. M. Dimmock, £1 (2nd donation) ; Dr. N MacFadyen, £1 ; Dr. G. W. May. £1 Dr A. D Whitelaw, £1 ; Dr. C. St. A Vivian, £2 2s.

£4 4s.—Per Dr. W. Smith, Chairman, Greenwich and Deptford Division (amount already sent, £12 19s.) ; Dr. G. M. O'Shaughnessy, £1 1s. : Dr. B. Isaac, £2 2s. ; Dr. W. H. Read, £1 1s

£3 3s.—Practitioners in the area of the Morpeth Division—per Dr. Stephenson (amount already sent, £39 18s.) . Dr. W. Macfarlane ; Per Dr. N. S. Twist, Wakefield L.M.W.C. (amount already sent £149 5s.) : Dr. P. J. Rafferty. Reading Division—per Dr. W. I. Bain (amount already sent, £1.029 14s.) : Anonymous.

£2 2s.—Practitioners in the Southport area—per Dr. J. C. Russell (amount already sent, £254 9s.) : Dr. J. H. Sykes. Bath Insurance Practitioners—per Hon Secretary, Bath Panel Committee (amount already sent, £9 9s.).

Practitioners in Salisbury Division area—per Dr. H. H. Clarke : Dr. S. E. Martin.

£1 1s.—Per Dr. J. M. Johnstone, N. Staffs. L.M.W.C. (amount already sent, £748 18s.) : Dr. A. P. Spark.

£1.—Per Dr. L. F. Hirst, Aldershot and Basingstoke Division (amount already sent, £26 5s.) : Lt.-Col. H. Kirkpatrick.

Local Medical and Panel Committees

£25.—Oxford City.

£20 16s 11d.—East Lothian (2nd donation).

£19 8s. 2d.—County of Dumbarton.

£10 5s.—Clackmannan County (2nd donation).

Total—£22,965 11s. 11d. and £100 3½% Conversion Stock.

Correspondence

The Certificates for Extra Milk

SIR,—I wish to protest against the new form of certificate for additional supplies of milk to persons suffering from certain diseases. What patient suffering from "active tuberculosis of the left lung" or "inability to swallow solid food by reason of a cancer of the oesophagus" wants to impart this information to his milkman? This factor will undoubtedly deter many patients for whom the scheme is intended from applying. By all means let the authorities instruct the medical practitioner as to what diseases "qualify ' for the extra milk—but as to broadcasting this confidential information to the dairyman—well!—I am, etc.,

Rayleigh, Essex, April 20. C. H. BATEMAN.

SIR,—There is a growing menace that has recently appeared in our midst ; I refer to the various types of certificate we are now called upon to complete to enable our patients to obtain meat instead of sugar, a different type of gas mask, or extra amounts of milk. In the latter case we are asked to complete a form specifying the exact nature of the disease from which the patient is suffering. This form, when duly completed by the householder, is then handed to the dairyman, who retains it until its period of validity has expired.

There appear to be several serious objections to this procedure. (1) We should not be asked to disclose the innermost secrets of our patients' bodies to the dairyman or any other interested or disinterested party. (2) In many instances it is most undesirable that the patient should have the opportunity of learning the exact nature of his disease—for example, "cancer of the oesophagus"—so glibly mentioned in the instructions. (3) The form when completed is only valid for one month except in exceptional circumstances, not specified, when most conditions for which the form will be used, such as pulmonary tuberculosis or gastric or duodenal ulceration, may require many months of, or even permanent, milk diet.

I consider this form implies a complete lack of confidence in the profession. Surely if we are considered an honest body of men all that should be necessary is for the profession to be circularized as follows: (1) Extra milk will only be supplied on written medical recommendation ; (2) only up to two pints daily can be granted ; (3) the period specified should not exceed three months ; (4) only for certain conditions, of which a list is given, will extra allowance be permitted; this would then enable us to deal very quickly with any patients who should approach us for extra milk with inadequate reasons.

Is it not cause for concern when a patient is faced with the alternative of publishing the fact that he is suffering from dysphagia due to an aneurysm of his aorta or starving to death? Is it not cause for concern that we are made to forfeit what has always been one of the finest traditions in our professional code? In conclusion, may I quote a passage from the Hippocratic Oath, which runs: "I will keep silence regarding that which, within or without my practice, I shall see or hear in the lives of men which should not be made public ; holding such things unfit to be spoken."—I am, etc.,

Southend-on-Sea, April 21. H. WALMESLEY GREENWOOD.

*** The Secretary of the B.M.A. states that this matter and others in connexion with the certificates for extra milk have been taken up with the Ministry of Food.

Discrepancies in Health Insurance Benefits

SIR,—Numerous letters have been published in the *Journal* recently on the future of medical practice, yet no one has mentioned the greatest scandal present in National Health Insurance practice to-day—a scandal which, if left unchecked, will be even greater with any extension of the N.H.I. system. I refer to the discrepancies between the benefits and sick pay distributed by the various Approved Societies. Surely it should be axiomatic that when all (of the same sex) pay the same premiums, all should receive the same benefits ; yet any practitioner who troubles to ask his patients will find that there is a difference—often of several shillings—between the cash benefits paid by different societies, while the differences between dental, ophthalmic, and "special appliance" benefits are even more marked and confusing.

Before the panel system is extended to higher income levels let the State take over the N.H.I. side of *all* the Approved Societies. Let every insured person be assured of a reasonable cash benefit when sick, together with full dental and ophthalmic benefits. Finally, let the economies so effected (by the State running one office and one agent for every dozen or more competing offices and agents to-day) provide an efficient pathological service for insured patients and a reasonable capitation fee for insurance practitioners. The advantages of such a scheme seem obvious. No additional money should have to be found by the State or the taxpayer, and a more efficient, better-paid service would be provided for patients and doctors alike. Why should any corporation or company profit by a State tax?—I am, etc.,

Prees, Shropshire, April 22 G. H. M. FRANKLIN.

WEEKLY POSTGRADUATE DIARY

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.—*Daily*, 10 a.m. to 4 p.m., Medical Clinics, Surgical Clinics and Operations. Obstetrical and Gynaecological Clinics and Operations. *Daily*, 1.30 p.m., Post-mortem Demonstrations. *Tues.*, 11 a.m., Paediatric Clinic. *Wed.*, 11.30 a.m., Conference (Medical) ; 2 p.m., Blood Substitutes in Transfusion. *Thurs.*, 2 p.m., Dermatological Clinic ; 2 p.m., Radiological Demonstration. *Fri.*, 12 noon, Conference (Surgical) ; 2 p.m., Conference (Gynaecological) ; 3 p.m., Sterility Clinic.

DIARY OF SOCIETIES AND LECTURES

EDINBURGH POSTGRADUATE LECTURES.—At Edinburgh Royal Infirmary, *Thurs.*, 4.30 p.m. Dr. M'Whirter: Progress in Treatment of Malignant Disease.

DAVYHULME MILITARY HOSPITAL MEDICAL SOCIETY.—*Thurs.*, 5 p.m. Dr. P. B. Mumford: Common Infective Disturbances of the Skin.

HARVEIAN SOCIETY OF LONDON.—At 26, Portland Place, W., *Mon.*, 2.30 p.m. Dr. John Taylor: The Coroner, the Doctor, and the Public.

B.M.A. : Branch and Division Meetings to be Held

EAST YORKSHIRE BRANCH.—At City Restaurant, Lowgate, Hull, Wednesday, May 7, 8.45 p.m. Annual General Meeting. Presidential Address by Dr. I. G. Innes: A State Medical Service. Preceded by supper at 8 p.m.

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

BIRTH

SMITH.—At the Lucy Baldwin Maternity Hospital, Stourport, to Jane Ellen (*née* Jones), wife of J. A. Smith, M.R.C.S., L.R.C.P., Barnsley Hall, Bromsgrove, a daughter.

MARRIAGES

CYRLAS-WILLIAMS—COLYER.—On April 18, at St. Michael's Church, Maidstone, R. W. Cyrlas-Williams, M.A., M.R.C.S., L.R.C.P., to Ruth Colyer, M.R.C.S., L.R.C.P.

TEMPLE—LEIGHTON.—On April 21, at Norwich, John Lloyd Temple and Charlotte Mary Leighton.

DEATHS

DURNO.—On April 28, 1941, at 22, Gelliwastad Road, Pontypridd, Wales, John Durno, M.D., age 83 years, late 168, Coldharbour Lane, London, S.E.5.

MORGAN.—On Sunday, April 20, 1941, at 35, North Parade, Aberystwyth, Morgan John Morgan, M.D.Brux, M.R.C.S., L.R.C.P., D.P.H., aged 70.

WATSON.—On April 23, 1941, at "Ormanli," Sandown Drive, Sale, Cheshire, Charles Watson (retired), L.M.S.S.A., age 64 years.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 10 1941

PULMONARY TUBERCULOSIS IN RECRUITS

FURTHER EXPERIENCE IN A SURVEY BY THE METHOD OF MINIATURE RADIOGRAPHY

BY

DOUGLAS GALBRAITH, M.D., F.R.A.C.P.

Major, Deputy Assistant Director-General of Medical Services, Australian Army Medical Corps

To judge by the correspondence in the medical journals that has followed the paper on this subject by Lieut.-Colonel E. L. Cooper (1940) the use of the method of miniature radiography by the Australian Army for the routine chest examination of recruits has created wide interest. The number of examinations during 1940 was more than 100,000, and it seems worth while to place the results on record. The most important reason, however, for a progress report on the subject is that striking confirmation of the value of this work has been obtained by Dr. Reginald Webster, pathologist to the Melbourne Children's Hospital, whose detailed results are recorded on page 701. Dr. Webster has had outstanding experience in this field, and the results of his investigation represent a considerable contribution to tuberculosis research. While there must always be a scientific doubt in regard to the radiological diagnosis of tuberculosis, there can be little objection to a diagnosis established by sound bacteriological methods.

Cost of Method.—Careful figures of cost have been maintained throughout in all the military commands. The cost per recruit has consistently averaged between 5d. and 6d. This figure covers cost of all films, miniature and 14 by 17 inch, cost of processing, wages of staff, and salaries of specialists. A liberal allowance for maintenance and for depreciation of plant brings the total cost for each recruit to an average of 10d.

Survey of Results and Value of the Survey

From the various military commands in Australia the results of the examination of more than 100,000 Army recruits are available. All these recruits had passed the clinical medical examination. Of this number 1.04% showed radiological evidence of active or latent tuberculosis of the reinfection type, thus representing rather more than 1 in 100 of those examined. In 0.56%, or rather more than 1 in 200, the condition was regarded as being active. These figures approximate very closely those reported by Lieut.-Colonel E. L. Cooper for the first 22,000 recruits examined. For obvious reasons the exact number of recruit examinations cannot be given, but it can be stated that considerably more than 1,000 recruits showed radiological evidence of active or latent tuberculosis of the reinfection type. In addition approximately 1 in 400 showed non-tuberculous pulmonary conditions on the radiograph and 1 in 1,000 had cardiac or vascular abnormalities. The detailed results are given in Appendix I.

Disregarding the humanitarian aspect and examining the problem strictly from the Army standpoint, the most important factors which operate when a soldier develops active tuberculosis are: (1) the loss of his services and of the work hours spent in giving him his military training; (2) the danger of his infecting others in the close proximity entailed in hutments and tents; (3) the financial loss to the taxpayer represented by the cost of treatment and by pension. The first factor is self-evident and need not be stressed. The second is dealt with convincingly by Dr. Reginald Webster. The factor of financial loss is not so clearly recognized. Two statements should suffice to give the necessary emphasis. The first is that, as quoted by Lieut.-Colonel Cooper, the cost in pensions and treatment of tuberculous soldiers of the First A.I.F. (1914–18) amounted in 1938 to approximately half a million pounds. The second is that the Department of Repatriation has found that in Australia in the last war the average cost of each ex-soldier with pulmonary tuberculosis has approximated £3,000. These figures should make clear the saving in cost by the sifting out of tuberculous recruits. It should be noted, too, that in addition to those cases developing active tuberculosis, repatriation experience has shown that many, if not all, of those soldiers with latent lesions who have developed pulmonary symptoms of any kind in the succeeding years have been regarded as eligible for treatment and pension.

Criticism of the Method of Miniature Radiography

Criticisms have fallen under two main headings—medical and administrative: (1) that the method of miniature radiography is not accurate enough, and that cases will be missed; (2) that because of delay in recruiting the method is impracticable as an Army measure.

1 (*a*). *That Recruits with Tuberculosis are Missed.*—While it is at once admitted that the miniature film is *not* as good as the full-size film and will not pick up 100% of early lesions, the degree of accuracy reached by experienced observers is very striking. Subsequent personal comparison of several hundred 14 by 17 inch films has inspired admiration for the "spotting" ability of the teams examining the miniature films. But occasional failure to recognize an early lesion would not seriously detract from the value of a method which has so

efficiently sifted out such a large number of cases. Three other methods of routine radiographic examination have been advocated by critics of the miniature films. These are:

(i) *Fluoroscopy.*—The time consumed is great and there is no permanent record—an important point in regard to the question of pensions.

(ii) *Use of the Full-size Film.*—The expense of this method is very high and much more time is required for taking, developing, and viewing the film.

(iii) *Use of the 5 by 4 inch Film.*—This eventually may be the method of choice, although a recent demonstration arranged in Melbourne by the Watson Victor *X*-Ray Company, in which miniature, 5 by 4 inch, and 14 by 17 inch films were compared, did not demonstrate any appreciable margin of superiority of the 5 by 4 inch film over the miniature film. Most of us who saw the demonstration preferred the miniature film.

Edwards (1940) complains that claims have been made that the question of the activity of a lesion can be decided on the miniature film. Lieut.-Colonel Cooper in his article clearly states that "the activity of a tuberculous lesion can rarely be determined upon a small film alone." In the Australian Army any attempt at radiological diagnosis of activity is made on examination of the subsequent 14 by 17 inch film. The basis function of the miniature film is to reduce the number of large films necessary. The criticism by Brailsford (1940) that many cases of pulmonary tuberculosis are detectable by clinical methods at a stage where there is no radiological evidence, although not a criticism of the miniature method, should be mentioned. D'Arcy Hart (1940), in reply, has inquired where such a series of cases has been published. Dr. Reginald Webster's observation of the finding of tubercle bacilli in three cases from which radiological evidence and clinical evidence were absent does, however, give cause for reflection and for further investigation. On the other hand, few clinicians experienced in tuberculosis would claim that any large number of recruits with clinical tuberculosis will have a completely normal chest radiograph.

1 (*b*). *That Non-tuberculous Recruits are Diagnosed as Tuberculous.*—Every recruit rejected as the result of *x*-ray examination is referred to the civil tuberculosis department for full investigation and treatment if necessary. Here the diagnosis is reviewed, and there is ample time for investigation and observation. This eliminates the possibility of wrongly labelling a man tuberculous.

2. *That Routine Radiography of Recruits is Impracticable because of the Delay occasioned in Recruiting.*—The report of the committee appointed by the Minister of Labour and National Service under the chairmanship of Lord Horder (1940), while expressing its opinion that the adoption of the method of miniature radiography represents the ideal to be aimed at in the medical examination of the armed Forces, stated that it is impracticable at the present time "because of lack of apparatus, lack of sufficient numbers of expert examiners, and because the inclusion of this form of examination would seriously delay the medical examination of recruits." Unremitting perseverance by a small group of enthusiasts, headed by Lieut.-Colonel Cooper and strongly supported by the Director-General of Medical Services, has in Australia overcome these very real difficulties. The Army now possesses ten units for miniature radiography, one of which forms a mobile unit in a train and travels great distances in Queensland. The whole of this apparatus, with the exception of *x*-ray tube, timer, and camera, has been manufactured in Australia. A team of keen experts has been gathered in each city, and there has been no hold-up of recruiting. Results of miniature films are available in as short a period as six hours. The maximum period allowed for obtaining results of miniature films is thirty-six hours. Approximately 97% of recruits can leave the recruit reception depot on receipt of this result. The other 3%, for whom large films have been ordered, have these taken immediately. The results are available within twenty-four hours, and the men are at once brought before the Specialist Board. Finality in regard to suspects is therefore reached within three days, and in most cases within a maximum period of seven days. Only occasionally is it found necessary to await the result of cultural tests. Details of procedure are given in Appendix III. The fact that the method has now been adopted by the Royal Australian Navy and the Royal Australian Air Force demonstrates its practicability. In both these services the result of several thousand radiological examinations shows approximately the same incidence rate of active tuberculosis as in the Australian Army—that is, about 1 in 200. Recently authority has been granted to carry out a radiological chest survey of internees in Australia.

Summary

More than 100,000 recruits of the Australian Imperial Forces have been subjected to routine chest *x*-ray examination by the method of miniature radiography.

One in every 100 has shown radiological evidence of active or latent tuberculosis, and 1 in every 200 of active tuberculosis.

The diagnosis of tuberculous infection has in a large number of cases been substantiated by bacteriological investigation, the results of which are given in this issue in a report by Dr. Reginald Webster.

A considerable number of instances of non-tuberculous pulmonary pathology and of cardiac and vascular lesions have been observed.

The results here given represent simply a summary of a very great deal of work done by members of the A.A.M.C., including medical officers, technicians, and staff, throughout Australia. The opportunity is appreciated of being able to acknowledge the enthusiasm and efficiency with which this work of considerable national importance has been carried out in every command in the Commonwealth. Valuable co-operation has been given by Stamford *X*-Ray Company and Watson Victor *X*-Ray Company.

APPENDIX I

Results of Analysis

Recruits examined by miniature radiography	Over 100,000
No. of 14 by 17 inch films ordered	2.74%
No. of films showing evidence in lung fields of past or present tuberculous infection of the secondary adult type of tuberculosis	1.04%
No. of recruits showing radiological evidence of active pulmonary tuberculosis	0.56%
No. of recruits showing fibrotic or calcified areas in the lung field suggesting a healed or quiescent lesion	0.47%
No. of recruits showing radiological evidence of non-tuberculous pulmonary pathology	0.25%
No. of recruits showing radiological evidence of cardiac or vascular lesions	0.12%

APPENDIX II

The Unit for Miniature Radiography

This remains substantially as it was described by Lieut.-Colonel Cooper in Appendix I of his original article. An improved Contax camera is now used. This is fitted with an f/1.5 lens and auxiliary lens. The latter permits accurate focusing at the short screen-film distance and is mounted on a special adjustable mounting-plate. The camera has been altered to provide locking facilities on both the lens aperture and the lens focus. Operation of the shutter has been eliminated, the shutter remaining open at all times, and the film being merely wound on one complete frame after each exposure has been made. The camera case has been supplied with a special mounting-plate, arranged for easy removal or fitting. The construction of the mounting assembly is such that there is no necessity to re-focus the camera at any time.

Experience over the past twelve months has brought about a definite improvement in the quality of the end-results, mainly due to two factors:

(*a*) Improved dark-room processing technique of the Super XX film.

(*b*) Improved projection facilities. Experience has shown that the image is best projected with a projector of the

400-watt type on to a screen made of a sheet of matt-surface bromide photographic paper which has been fixed, and of a projection-screen size not exceeding 10 by 12 inches, framed with a flat black mask, thus eliminating unwanted reflection from the edges of the projection screen. It is sometimes found helpful to view doubtful lesions through opera-glasses.

It is anticipated that film manufacturers will specially develop a film for miniature radiography with the object of increasing the speed of the emulsion to the particular luminosity given off by the fluorescent screen and of providing greater contrast in the image recorded on the photographic emulsion. Lag in the fluorescent screen has no detrimental effect, and in fact enables the actual exposure time to be reduced. For miniature radiography the apparatus is operated at 50 mA 85 kV, with exposure times in the order of 0.5 second.

Tube and maintenance costs have been comparatively minor items, due, we believe, to the fact that excessive milliamperages that could not safely be used when operating at high speed even with fully rectified equipment have not been employed. Little alteration has been found necessary in the clerical and radiographic procedure originally adopted. At some centres where line conditions are not ideal, the fitting of a constant current stabilizer ensures greater uniform density in resulting miniatures, and provides a further safeguard against tube overload.

APPENDIX III

Procedure Employed

In the main this is as laid down in Appendix II of Lieut.-Colonel Cooper's original paper. In order to bring the result of the chest radiograph into the same category as the blood group and the results of vaccination and inoculation, steps are being taken to have an appropriate entry recorded in each soldier's pay book.

The following is a summary of the procedure in regard to each recruit:

1. On completion of the ordinary medical examination, which is a very thorough one, the applicant goes into an adjoining room and has the chest radiograph taken on the unit for miniature radiography.

2. All miniature films taken up to 3 p.m. are examined on the same evening by the Viewing Committee, consisting of at least one radiologist and one physician. Films taken after 3 p.m. are viewed the following evening.

3. Recruits are paraded next morning. Those whose films are regarded as beyond suspicion are drafted to units. If any abnormality is detected, or there is a reasonable doubt, a 14 by 17 inch film is at once taken. Approximately 3% of recruits have the large films taken. This film is examined by the Viewing Committee the same day.

4. Those who have had 14 by 17 inch films taken are paraded either on the second day or the third morning. If the film has been passed enlistment proceeds. If not, the man is examined by a Specialist Board appointed for this purpose and consisting of one consulting physician interested in tuberculosis and one specialist in tuberculosis. This examination is in most cases carried out at once. If it has to be deferred the man is drafted to accommodation reserved for this purpose in a camp hospital. The acceptance or rejection of the recruit depends not on the radiological report but on the opinion of this Specialist Board, which reviews the history, the clinical and radiological findings, and in some cases the bacteriological results. If rejected the man is placed under the care of the State Department of Tuberculosis, and his name is notified to this department.

5. In a large number of instances it has been possible to have a complete bacteriological investigation carried out, including culture of sputum or gastric contents.

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BACTERIOLOGICAL EXAMINATIONS SUPPLEMENTING THE RADIOLOGICAL SURVEY OF THE AUSTRALIAN IMPERIAL FORCE

PRELIMINARY REPORT

BY

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The present report is published with the approval of the National Health and Medical Research Council of Australia, and at the suggestion of the Director-General of Medical Services, Major-General R. M. Downes, who from the moment of his authorization of the work has followed its progress with a lively and sympathetic interest.

Scope and Objective

In the detection of pulmonary tuberculosis the ultimate and only unequivocal proof is the demonstration of the tubercle bacillus: the necessity for providing bacteriological confirmation of radiological diagnosis whenever possible requires no emphasis.

Many accounts of mass radiological surveys have appeared within recent years, but in the few in which bacteriological findings are mentioned such reference is limited to a statement that a certain proportion of the subjects of the *x*-ray investigation exhibited a "positive sputum." By this term it is generally to be understood that tubercle bacilli are brought into evidence by the microscopical search of films: but as a means of sifting sputum and other pathological exudates for tubercle bacilli microscopical search is a sieve of very coarse mesh. It has been computed by H. J. Corper (1928) that tubercle bacilli are not detectable in smears until their numbers reach 100,000 per c.cm., whereas guinea-pig inoculation and appropriate methods of cultivation will disclose them in numbers as few as 10 to 100 per c.cm.

To the best of my knowledge the relevant literature contains no record of a large-scale radiological survey supplemented by a concurrent and carefully planned bacteriological investigation of the scope and character which it is the purpose of this report to indicate.

The systematic radiological examination of the entire personnel of the Second Australian Imperial Force, carried out under military discipline, created an opportunity, unprecedented in Australia, of instituting an important and far-reaching public health research. If parallel bacteriological work could be sustained it held promise of providing data upon which to assess the accuracy of microradiographic diagnosis, of being of immediate practical assistance to medical boards, and of elucidating facts regarding the existence and number of "carriers" of the tubercle bacillus among a large and presumed healthy section of the population. This phase of the investigation assumed prime importance when considered in relation to proposals for the eventual extension of thoracic radiography to the civilian community.

In planning the work from the laboratory aspect it was realized that there would be few opportunities of repeating the bacteriological examination for any individual soldier. Both the magnitude of the undertaking and the necessity for working within Army requirements for prompt disposal of the men precluded, in the great majority of instances, more than one attempt to establish the diagnosis of pulmonary tuberculosis on an incontestable bacteriological basis. In view of the serious

limitations of direct microscopy of smears of sputum, provision was made to subject to cultivation by methods appropriate to the growth of *B. tuberculosis* all specimens of sputum in which the search by microscope should fail. It was further designed that, should sputum be unobtainable, identical procedures would be adopted with the mucus aspirated from the fasting stomach.

Principles

Experience during the past three years in the examination of 1,270 diverse samples of pathological material suspected of a tuberculous origin has convinced me of the reliability and sensitivity of a proper technique for the cultivation of tubercle bacilli and of the inadequacy of the film method. Shrewsbury and Barson (1937) of the University of Birmingham showed that the method of culture employed by them yielded 100% of successful cultures of the tubercle bacillus from a diversity of specimens comprising sputum, cerebrospinal fluid, urine, faeces, and pus. The same workers demonstrated that of 135 samples of sputum in which tubercle bacilli could not be detected microscopically 29 (21.4%) were tuberculous by cultural examination. Similar findings have been recorded by C. A. Green (1938) from the bacteriological department of the University of Edinburgh. Green reported that in the examination of 2,796 specimens of sputum for the presence of tubercle bacilli the positive findings by cultivation exceeded those attending the microscopical examination of films by nearly one-third (32.4%). More striking perhaps in this particular are the figures of Corper and Cohn (1933), who have published results of a routine cultural examination for tubercle bacilli of sputa in which the organisms could not be detected by microscopical search. Of 100 samples of sputum, in which "negative" results were consistently obtained in monthly examinations of film preparations over periods ranging from four months to two years, no fewer than fifty yielded a "positive" finding by a single cultural test.

The significance of such findings as a compelling indication for the adoption of routine culture of sputa under suspicion as tuberculous is obvious, and for the purpose and under the conditions of the research relating to the Second A.I.F. systematized cultivation of sputum and/or gastric mucus was imperative.

The demonstration of tubercle bacilli in the mucus aspirated from the fasting stomach has long been familiar in paediatric practice, forty-one years having elapsed since Meunier first introduced the method to overcome the difficulty occasioned by the fact that children invariably swallow rather than expectorate sputum. Meunier's work did not attract the attention it undoubtedly merited until it was applied by Armand Delille and Vibert in 1927. Since that year a number of workers in the field of paediatrics—notably Wallgren in Sweden, Poulsen in Denmark, and Collis and Brockington in England—have established the method as one of very great clinical value.

Influenced by the fact that many specimens of so-called sputum do not represent mucus of bronchial origin, and that many persons excrete small amounts of bronchial mucus which they swallow rather than expectorate, a number of Continental workers, led by Armand Delille, Lestocquoy, and Vibert (1930), have applied Meunier's principle to the examination of adults. In England they have been followed by Kayne and Hounslow (1939), whose work represents the only attempt so far recorded on the part of English workers to extend to adult practice a technique which has yielded such striking results among children. Kayne and Hounslow have reported findings in which by cultural and animal inoculation methods tubercle bacilli were shown to be present in the gastric content of 17 out of 55 sanatorium patients who either produced no sputum or provided specimens in which both direct and cultural methods of examination failed to detect tubercle bacilli.

Arresting evidence of the importance of directing attention to the contents of the fasting stomach in the endeavour to obtain bacteriological confirmation of radiological indications of pulmonary tuberculosis is furnished by the work of R. H. Stiehm (1939), Director of the Department of Student Health in the University of Wisconsin. Stiehm assembled 50 students in whom radiological findings denoted the presence of what he termed "minimal" pulmonary lesions. In none of the group was there any clinical evidence of tuberculosis; all of the students regarded themselves as well, and in such samples of sputum as they could produce the tubercle bacillus could not be demonstrated. The next step was to subject each student to aspiration of the contents of the fasting stomach on three successive mornings in order to examine the product for the presence of tubercle bacilli by microscopical search and animal inoculation. Acid-fast bacilli were found in films of gastric mucus in 9 of the 50 students, but in no fewer than 36 (72%) tubercle bacilli were revealed in the gastric content by guinea-pig inoculation. In 36 instances, therefore, the radiological findings were endorsed and the presence of an unhealed tuberculous lesion was unequivocally demonstrated.

Procedure and Standards

With the imprimatur of the Director-General of Medical Services, Major-General R. M. Downes, and the co-operation of the Deputy Director of Medical Services, Southern Command, Colonel C. Gordon Shaw, a routine has been established in Victoria by which recruits who display radiological evidence of pulmonary tuberculosis are sent to the Camp Hospital, Broadmeadows, whence they are paraded in batches of four, six, or eight a day at the Children's Hospital laboratory. The men arrive at 9 a.m., having had no food or drink since the previous evening. Those who can expectorate a specimen which can be approved as genuine bronchial mucus are excused the passage of a Rehfuss tube, but it was to be anticipated that many of these apparently healthy young men would be unable to produce any sputum. In dealing with such the routine is to aspirate the contents of the fasting stomach, and the men have co-operated extremely well in the swallowing of the Rehfuss tube.

It is considered very important that the men should present themselves in person and not send in samples of sputum. By the latter procedure many unsatisfactory and salivary specimens would be received; there is also the risk of substitution of specimens. With the man in attendance the specimen of sputum can be approved or otherwise, and in the latter event a sample of the contents of the fasting stomach secured.

The standards adopted in the Army bacteriological examinations are as follows:

1. If acid-fast bacilli are demonstrable in direct Ziehl-Neelsen preparations from sputum a "positive" bacteriological finding is returned.

2. If an acid-fast bacillus of the requisite cultural characters is cultivated from the sputum of a man designated radiologically "active" it is accepted as *B. tuberculosis*.

3. If the acid-fast bacillus is recovered from the sputum of a man designated radiologically as the subject of old, healed, inactive, or doubtful pulmonary tuberculosis, such acid-fast bacillus is required to produce progressive tuber-

culosis in a guinea-pig before final acceptance. In the meantime a report of a "strong presumption" of active pulmonary tuberculosis is issued.

4. In every instance in which the acid-fast bacillus is cultivated from the gastric mucus, irrespective of the character of the radiological report, the virulence of the culture for the guinea-pig is determined. This is rendered necessary by the occasional occurrence of saprophytic acid-fast bacilli, some of which, particularly those of "rough" cultural characters, closely resemble true tubercle bacilli. Again an interim report of "strong presumption" of active tuberculosis is issued.

Progress Results

In this investigation, so far, the number of men for whom examinations are complete to date is 322. In the early stages of the work a number of men (51) were sent for examination in error; for although all were rejected or deferred by the radiologists, such action was based on grounds other than that of pulmonary tuberculosis. The intrathoracic pathological states disclosed by *x*-ray examination of the men in this group included such conditions as congenital pulmonary cysts, hydatid cysts of the lung, mediastinal tumour, probable pulmonary neoplasm, abnormal cardiac shadows, and varying degrees of dilatation of the aorta. That a little confusion should have occurred in the beginning is a circumstance not altogether to be regretted, for these men furnish an interesting control group. From only one man of the 51 was an acid-fast bacillus recovered by culture; the source of the culture was gastric mucus, and the organism was eventually shown to be non-virulent to a guinea-pig.

Eliminating 51, therefore, as never having been radiologically suspect as regards pulmonary tuberculosis, the number of men rejected or deferred by reason of *x*-ray evidence of pulmonary tuberculosis, and in whom bacteriological examination was undertaken, was 271. Of these, 100 (36.9%) were shown to be actively discharging tubercle bacilli. The manner in which the positive bacteriological findings were determined in the 100 cases was by direct smear examination of sputum, 32; by culture from sputum in which tubercle bacilli could not be detected by microscopical search, 46; by culture from the gastric mucus of men from whom no sputum was obtainable, 22.

The application of cultural methods and the utilization of gastric contents in the absence of sputum have therefore resulted in 100 positive findings, as against the 32 which would have been the number had the examinations been restricted to smears of sputum. The average reporting time for sputum cultures was 18.6 days, and the average for gastric mucus cultures 21.6 days.

Commentary

That the figure for positive results obtained by the microscopical examination of smears of sputum (32) compares so unfavourably with that attending sputum cultures (46) cannot be attributed to hurried or inadequate scrutiny. Considerations of economy of effort and culture medium, and the possibility of summary disposal of the specimen with an immediate positive report, were strong inducements to persevere in the search for acid-fast bacilli in the films.

The method of cultivation applied throughout has been the sulphuric acid technique of Lowenstein, and the culture medium chosen that of Petragnani as modified by S. Russell Jamieson (1936). At least three culture tubes have been prepared from every specimen of sputum or gastric mucus, and six tubes of medium have often been expended on one individual.

The positive findings attending cultivation from the gastric mucus (22) have all been verified by virulence tests and by proof of the ability of the cultures to induce progressive, widespread, and fatal tuberculosis in guinea-pigs. It is of interest to note that in eight men acid-fast bacilli, subsequently shown by cultivation and guinea-pig inoculation to be virulent tubercle bacilli, were detected by the microscopical examination of direct smears of the gastric mucus.

There were seven instances of cultivation of acid-fast bacilli from the gastric contents not included in the above statement of results. Three were omitted because the men who provided them had already been included in the group confirmed bacteriologically by the detection of tubercle bacilli in film preparations of the sputum. Of the remaining four, two were non-virulent to guinea-pigs, and in two the virulence remained undetermined owing to the late appearance of contaminants in cultures which were perforce neglected for some time owing to pressure of work.

Of the 100 men in whom bacteriological proof of active tuberculosis has been adduced so far, 54 maintained negative answers to specific questions regarding haemoptysis, pleurisy, sanatorium treatment, and the occurrence of pulmonary tuberculosis among their near relatives. A few spoke lightly of a "cigarette cough," while many declared that, childish illnesses excluded, they had never had occasion to consult a doctor and had never lost a day's work. Affirmative replies with respect to one or more points in the cross-examination indicated above were received from the remaining 46 men. Eight had experienced haemoptysis and 16 had suffered an attack of genuine pleurisy. Two were obviously ill when they were presented for bacteriological examination. No fewer than 10 had formerly been inmates of sanatoria, and 17 confessed to the occurrence of pulmonary tuberculosis in their own families or among their near relatives. Such information was no doubt suppressed by these men at the time of their enlistment and preliminary medical examinations, but with the realization that they had been weighed in the radiological balance and found wanting they evidently felt that they could gain nothing by further concealing the facts of their clinical histories.

Correlation of Radiological and Bacteriological Findings

It is laid down as routine procedure in the radiological survey of the Australian Military Forces that every man concerning whom suspicion is raised by the miniature screen photograph shall be re-examined by the standard 14 by 17 inch radiograph. The radiological reports upon which the following correlation of *x*-ray and laboratory findings is based are those issued as interpreting the large films.

Group I

In a group of 152 men in whom the radiograph was regarded as indicative of *active* pulmonary tuberculosis the number of positive bacteriological findings was 83 (54.6%).

Group II

Among 90 men designated radiologically as subjects of old, healed, inactive, or doubtful tuberculosis there were 10 (11.1%) positive bacteriological results. *B. tuberculosis* was recovered by culture from the sputum of 6 of the men in Group II, by gastric mucus culture in 3, and in the case of the tenth man acid-fast bacilli were found in a Ziehl-Neelsen preparation of the sputum. All six sputum cultures, as also the three gastric mucus cultures, induced severe and fatal tuberculous lesions in

guinea-pigs. The following table supplies some details of this interesting group:

Serial No.	X-ray Report	Bacteriological Report	History
37	Scattered calcification; right apex	Positive gastric culture	Pain in chest 15 months ago; did not go to bed. Otherwise had always been well
73	Evidence of old Tb. infection in the lungs; nothing suggesting anything recent	Positive sputum culture	Haemoptysis; sanatorium treatment; fistula in ano
137	Suspicious area in right infraclavicular region, radiating from hilum. Defer	Positive gastric culture	Clear personal and family history
167	Small calcified nodules in apex of left upper lobe. No evidence of activity, and remainder of lungs normal	Positive sputum culture	Three years in sanatoria. "Short of breath"
225	Small calcified nodules at left apex. No definite evidence of activity	,,	"Dry" pleurisy 15 years ago; was not laid up. Otherwise always well
247	Localized Tb. infiltration at left apex; one very small nodule in first interspace area; a little calcification evident. Suggest bacteriological examination	,,	Haemoptysis in 1930. Sanatorium for five months in 1932. Father died of pulmonary Tb.
250	Very slight Tb. lesions; both apices Partly calcified. Suggest bacteriological examination	,,	Personal and family history clear
251	Slight infiltration in apical region of right upper lobe. Left lower probably Tb. Suggest bacteriological examination	,,	Suspected of pulmonary Tb. in 1939. Sister died of phthisis
302	All tuberculous lesions of right upper lobe quiescent. For bacteriological examination	Positive gastric culture	Served in war of 1914–18. "Pulmonary fibrosis"
307	Exaggerated lung markings in right chest. ? upper respiratory infection and delayed resolution of acute process	Acid-fast bacilli in smear of sputum	Clinical and family history clear

It may fairly be represented that although the figure for the proportion of bacteriological confirmations of x-ray diagnosis is high, particularly in Group I, in which it reached 54% among 152 men designated subjects of active pulmonary tuberculosis on radiological evidence, it is of necessity an under-estimate. As has been indicated, the men pass the laboratory way but once, and it is only in exceptional instances that repeat examinations are feasible. Were it possible again to comb through those men for whom a negative bacteriological finding has been recorded it is more than probable that the tubercle bacillus would be uncovered in some of them.

Group III

There remain three men to be placed in a third group because no x-ray evidence of pulmonary tuberculosis was apparent.

Serial No.	X-ray Report	Bacteriological Report	History
238	Lungs clear; pass	Positive sputum culture	Father died of pulmonary Tb. 12 months ago. Two cousins have been in sanatoria
253	Pass	,,	Pleurisy 4 months ago. Brother rejected as active Tb.
255	No sign Tb.: pass	Positive gastric culture	Personal and family history clear

That the above three cultures were those of genuine and virulent tubercle bacilli was proved in each instance by guinea-pig inoculation.

In the case of No. 253 it has been ascertained that he was sent for examination in mistake for his brother, who was summarily rejected by the radiologists. No. 253, however, gave a history of pleurisy, and from a second sample of sputum acid-fast bacilli were again cultivated. That No. 238 and No. 255 presented themselves for bacteriological examination must have been fortuitous in view of the x-ray reports with regard to them, and three such unanticipated bacteriological results are startling, and are provocative of reflection.

Conclusion

The work will be continued in 1941, and the present communication, as a preliminary report, is limited to a statement of objectives, underlying principles, methods, and progress results. Temptation to comment on the vexed question of the radiological estimation of activity, and to discuss risks of error due to the appearance of chromogenic acid-fast bacilli other than true tubercle bacilli in cultures, must be resisted in view of wartime exigency regarding space.

It is submitted, however, that the results obtained to date establish beyond criticism the prescience of the policy which instituted the radiological survey of the Second Australian Imperial Force.

The work which I have endeavoured to outline is sponsored by the National Health and Medical Research Council of Australia, by whom a research grant has been allotted for its continuance.

I have already expressed appreciation of the encouraging interest of Major-General R. M. Downes and the cordial co-operation of Colonel C. Gordon Shaw. Other officers who have done much to facilitate the inquiry are Lieut.-Colonel E. L. Cooper, Lieut.-Colonel L. M. Routh, Major Douglas Galbraith, and Captain N. T. Bull. As Officer-in-Charge, X-ray Department, Southern Command, Captain Bull has maintained a happy liaison between the x-ray service and the bacteriological laboratory. My technical assistant, Mr. H. Weir, is bringing to the work an enthusiasm and a devotion to duty which are beyond praise.

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THE BLOOD PLATELETS AND SPLENIC EXTRACTS

BY

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In 1938 Troland and Lee reported the presence of platelet-reducing principle in acetone extracts of spl from patients with thrombopenic purpura; when gi intravenously to rabbits these extracts lowered the co of the circulating platelets. Torrioli and Puddu (19 then drew attention to earlier work by themselves a others in this field. They had found that aqueous extr both of normal spleens and of spleens from patients w thrombopenic purpura contained a factor which capable of inhibiting the development of megakaryocy when given in small doses but damaged them in lar doses. These workers also succeeded in producing a f in the circulating platelets in the rabbit by intraveno injection of an aqueous extract of a normal spleen.

Several workers have attempted to confirm the resu obtained by Troland and Lee. Major and Weber (19 obtained negative results with two spleens from cases thrombopenic purpura. Pohle and Meyer (1939) m spleen extracts from three cases of thrombopenic purp with completely negative results. Using spleens from t such cases, Hodge and Strong (1939) were equally unsu cessful. All these workers used acetone extracts. Hob and Witts (1940) obtained a fall of platelets in the rab with an acetone extract of the spleen from one case thrombopenic purpura. They also prepared acetone

saline extracts of normal spleens: the acetone extract was inactive, but the saline extract reduced the platelet count when given intravenously in a large dose.

Rubegni (1940) discusses the work of Defrise, who modified the technique of Troland and Lee by a further extraction with ether and obtained positive results with the spleen removed from an ill-defined case of haemorrhagic disease. Rubegni made acetone extracts from fresh calf's spleen, liver, and muscle, and administered them intravenously to rabbits. The splenic extracts produced in most cases a fall in platelet count of about 50%; the liver extracts were also followed by a decrease in platelets, though less than that produced by the splenic extracts; muscle extracts caused no change. Rubegni did not succeed in keeping a rabbit's platelets low by repeated injections, though this had been done by Troland and Lee.

It appears from the literature that the platelets of the rabbit may fall when extracts of spleen are administered intravenously. This effect is inconstant, and it is by no means limited to spleens obtained from patients with thrombopenic purpura; it may also occur with extracts of normal spleens and liver.

Experimental Methods

The objects of the following experiments were, first, to compare the effect of different types of extract of the spleen and the tissues used as controls; and, secondly, to see if any depression of the platelets resulted if the injections were not given intravenously.

Extracts were made from post-mortem material, sheep spleens removed directly after killing, and three spleens removed at operation from patients with thrombopenic purpura. Acetone extracts were prepared as described by Troland and Lee, and alcohol extracts by a similar technique. Saline or aqueous extracts were made by mincing the spleen and extracting in the cold for twenty-four or forty-eight hours, then centrifuging. When saline extracts were kept several days for repeated injections they were covered with toluene and shaken periodically. These extracts were usually made up so that 1 c.cm. of the final extract corresponded roughly to 1 gramme of spleen. Another extract was prepared by treating finely minced spleen with anhydrous sodium sulphate at 37° C., separating the supernatant fluid, and then removing as much of the sodium sulphate as possible; 170 grammes of spleen was used, and the resulting extract, made up to 5 c.cm., was given to one rat. Pressed juice from spleen was also tried. Another spleen was allowed to autolyse under toluene; but this preparation was too toxic, and the rats receiving it died.

The extracts have in most cases been given by the intraperitoneal route to rats, the rest intravenously to rabbits. The rats weighed 0.3 to 0.4 kg. and the rabbits about 1.5 kg. The platelet counts were made by a direct method (Lempert, 1935). Counts were made on the day before injection, again immediately before injection, and then several times in the twenty-four hours following injection; none of the changes observed persisted more than twenty-four hours. Rat platelet counts usually gave figures between 500,000 and 900,000 per c.mm. in blood obtained from the tail after warming. With rabbits the counts were lower. In all, 56 rats and 14 rabbits received injections, the animals being used once only. As controls, pairs of rats were given intraperitoneal injections of 10 c.cm. of sterile Ringer-Locke solution, a 10% suspension of human red cells, and a saline extract of muscle; the rats receiving Ringer's solution showed a rise in platelets of 15%, the others no change or a slight fall. The degree of accuracy in counting is not high, and I do not regard alterations of the order of 20% as having much significance.

Extracts of Normal Spleen

Six rats received acetone extracts of human spleen, the dose varying from 5 to 15 c.cm. The greatest subsequent change from the level just before injection was a fall of 35%, but in another rat a larger dose of the same extract caused no reduction in platelets. The other injections were followed by falls of 16% or less.

Six rats received alcoholic extracts of human spleen in doses of 5 to 15 c.cm. The extract given to two of them was toxic, and they died; injection of the other extract was followed by changes in the platelet count varying from a rise of 11% to a fall of 28%, without relation to the size of the dose.

Six rats were given Ringer's extract of normal human spleen in doses of 5 to 15 c.cm. Here the changes in platelet count varied from an increase of 12% to a decrease of 25%, independently of the dose.

Four rats were given 10 to 15 c.cm. of an aqueous extract prepared from a human spleen dehydrated with alcohol, dried, and powdered before extraction. There was no effect on the platelet count. Two rats were given 10 c.cm. of saline extract of fresh sheep spleen without effect on the platelets. Two more rats received 10 c.cm. of pressed spleen juice: no change resulted in one; the other showed a rise of 17%. The sodium sulphate extract did not alter the platelet count.

In order to determine whether repeated injections might depress the platelet count, one group of 6 rats received four injections, each of 10 c.cm., of saline extract of fresh sheep spleen, given over a period of nine days. Platelet counts were made on the day before the first injection, several times during the course, and for two days after the last injection. Only one rat showed any appreciable change, and that was a transient elevation of 40%. Four other rats received repeated injections of acetone extract of fresh sheep spleen, counts being made in the same way. No significant changes were observed.

Extracts given Intravenously

Normal saline extracts of muscle, liver, and sheep spleen were given intravenously to rabbits in 20-c.cm. doses. Two rabbits receiving splenic extract showed falls of 27 and 29%; two receiving liver extract showed falls of 25 and 38%; muscle extract caused a fall of 50%.

Extracts of Thrombopenic Spleens

Three such spleens were available. The first was from a woman of 27 with purpura of acute onset, characterized by severe haemorrhage, a greatly prolonged bleeding-time, and a platelet count below 10,000. No drug or medicine had been taken by the patient. The other two spleens were from chronic cases of the disease, one being removed during an interval and the other during an active phase. Each spleen was divided into halves, and acetone and saline extracts were prepared. The residue from the saline extract was subjected to further extraction with alcohol. These extracts were prepared aseptically, and each was injected into both rats and rabbits.

When given to rats intraperitoneally in 10-c.cm. doses none of the extracts caused any significant change in the platelet count. One rat received four injections of a saline extract on alternative days without a decrease in platelets. The acetone extracts were given intravenously to rabbits in doses of 25 to 45 c.cm. and caused falls of 15 to 35% in the platelet count; in the same doses the saline extracts produced falls of 23 to 28%. In all cases the falls appeared within a few hours of injection and the counts had returned to their previous level within twenty-four hours.

Discussion

These results show that none of the extracts tested, whether from normal spleen or thrombopenic spleen, contains a thrombopenic principle in quantity sufficient to be demonstrated by intraperitoneal injection into rats. The occasional falls recorded are not large enough to be significant and did not occur in other rats receiving the same extract. Repeated injections have been no more successful in reducing the platelet count. When the extracts were given intravenously to rabbits the results were rather different. Some lowering of the platelet count was produced by all the extracts used—the least by an acetone extract of thrombopenic spleen, the greatest by a saline extract of muscle. This suggests that tissue extracts given intravenously may lower the platelet count, but it does not support the view that there is a specific thrombopenic factor in splenic extracts.

All the reports dealing with the existence of such a factor, except those of Torrioli and Puddu (1934) on its effect on the megakaryocyte in marrow culture, are based on the results of intravenous injection. Many non-specific agents—for example, heterologous red cells or serum, peptone, and suspensions of micro-organisms or inert particles—are capable of causing a considerable reduction in platelets when given intravenously (Tocantins, 1938), and there is no reason why these comparatively crude extracts of the spleen should be put in a special category. It is also worth noting that a splenic extract has been reported as causing a thrombocytosis when given subcutaneously (Haenlein and Schliephake, 1935) and that an anti-spleen serum produces thrombopenia (Bedson and Johnston, 1925). The evidence for the existence of a specific thrombopenic principle in splenic extracts is therefore unconvincing.

Summary

A series of extracts from normal spleens and from three cases of thrombopenic purpura have been prepared, and were injected into rats and rabbits. No evidence of the existence of a specific thrombopenic factor was found, and it is suggested that the positive results of a few others workers may have been due to non-specific reactions to intravenous injections.

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EVALUATION OF HYSTERICAL SYMPTOMS IN SERVICE PATIENTS

BY

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Since the outbreak of war the Navy has been working under conditions of continuously severe stress, and the personnel has been increased by the introduction of many conscripted recruits. Mainly among these men, and among reservists recalled from their civilian jobs and from home life to the rigorous conditions of the Service in wartime, a certain number of hysterical reactions have inevitably occurred. It has already been shown, both in the last war (Beaton, 1920) and in this (Curran and Mallinson, 1941), that the incidence of hysteria as a primary diagnosis is not high in naval psychiatry.

The committee on head injuries of the Medical Research Council (private information, unpublished) has defined hysteria as "a condition in which mental and physical symptoms not of organic origin are produced and maintained by motives never fully conscious, directed at some real or fancied gain to be derived from these symptoms." In addition to a definition it is necessary, for clinical purposes, to have criteria which will help to reduce the very varied manifestations of hysteria to an ordered symptomatology, to minimize subjective and impressionistic judgments, and to cut short philosophical speculation about fully and incompletely conscious motives. The Services make demands on their medical officers which call for special criteria of prognosis and recovery. The disappearance of symptoms is not enough; a reasonable assurance of future reliability and freedom from relapse under war stress is required. If this assurance cannot be given, discharge from the Service is called for, even though recovery may be adequate from the point of view of civilian life. It must also be remembered that a successful hysterical "escape," if the motive is even dimly present in consciousness, will permanently reduce the social efficiency of the individual by facilitating a recurrence in the face of subsequent difficulties, and within the Service it will impair morale by inviting imitation by others.

The long and unbroken period of active service which the Navy has undergone is offered as the reason for giving a short account of a classification, derived from clinical and aetiological considerations, which has been found of practical value in the treatment and disposal of patients showing a hysterical reaction. On discharge from hospital a patient may (i) return to full duty, (ii) return to modified duty in accordance with psychiatric advice, or (iii) be invalided from the Service. The reactions are classified as follows: (1) simple hysterical dissociation; (2) hysterical *prolongation*; (3) hysterical *exaggeration*; (4) hysterical simulation; (5) hysterical "complications" of an underlying disorder.

1. Simple Hysterical Dissociation

This group, in which the symptoms arise without any conscious motive and without other signs of psychiatric disorder, includes both (*a*) those cases in which there is little or no lapse of time or period of meditation after the precipitating physical or mental trauma, and (*b*) those which follow a long period of stress or conflict.

(*a*) As an example of the former one may cite the instantaneous paralysis of a limb which sometimes accompanies a relatively slight flesh wound. In such cases, if the hysterical dissociation is uncomplicated by any other disorder and psychiatric treatment is given early, the prognosis for return to duty should be good. Acute cases of this type, however, are rarely seen in our unit, which is analogous to a military base hospital. Where the removal of the hysterical symptoms releases much anxiety the prognosis depends upon the intensity of the objective signs of anxiety (see "5. Hysterical Complications").

(*b*) The following is an example of the latter type of reaction.

Case 1.—A stoker who joined the Navy two years ago was admitted following a hysterical fugue. He had an amnesia for the whole period since he joined the Service, but he showed no anxiety or other psychiatric disorder. In the course of investigation and treatment it materialized that he had joined the Navy primarily because a girl to whom he was attached admired the uniform. Shortly afterwards this girl gave him up and he became attached to another girl of a rather higher social standing. He had for long been preoccupied with the idea that he would never earn enough money in the Navy to justify his proposing marriage to this girl. This conflict gave rise to hysterical dissociation only after many months. The Service prognosis of such cases must be more guarded because the psychopathical mechanisms which produce the symptoms have often been operative long enough to impair the stability and adaptability of the personality. In other words, the longer a conflict persists before it is "resolved" by a flight into hysterical dissociation the more difficult it will probably be to get the patient to face up to the less pleasant alternative.

2. Hysterical Prolongation

Here the symptoms arise on a basis of previous organic or psychological disorder in association with a greater or less degree of consciousness of motive. Typical instances are the hysterical persistence of headache in patients convalescent from head injury and of tremor following acute

anxiety: the cerebral and emotional disturbances respectively are over, but the patient is reluctant to give up symptoms which are preventing his being ordered to face the same dangers again. In other cases, as those in which hysterical headaches or dyspepsia, for example, supervene upon a recovering affective reaction, the symptoms bring about a continuation of the illness by replacement or substitution rather than by direct prolongation.

Case 2.—A reservist aged 38 was drafted on recall to a destroyer, which was mined three months after his joining her. Following the immersion he developed a suppurative mastoiditis, which was operated upon successfully, with a good preservation of hearing. For several months afterwards, however, he complained of vague paraesthesiae behind the ear and numbness and weakness of the whole of the same side of the body. The continuance of these symptoms was dependent upon his reluctance to return to sea, and as there was considered to be no risk of the development of more serious psychiatric disorder he was given an explanation, was reassured, and was sent back for a preliminary period of shore service.

3. Hysterical Exaggeration

This takes the form of an exaggeration of an organic or psychological disorder which still exists.

Case 3.—A seaman cook aged 25 was drafted on conscription to a trawler; he had previously been a cook in the Merchant Service in large liners. He disliked the small ship and suffered a good deal from sea-sickness. The symptoms of sea-sickness became elaborated into a syndrome highly suggestive of duodenal ulcer, and they persisted when he came into hospital. Investigations for an organic lesion were negative, and it appeared that the elaboration had been possible because his father had for years been under treatment for duodenal ulcer and the symptomatology was table-talk at home. While he was in hospital retention of urine occurred, undoubtedly the product of hysterical simulation. But little anxiety accompanied this reaction, the symptoms subsided with explanation, and he was ordered to return to duty. In order, so far as possible, to prevent a relapse a recommendation was made for drafting to a larger ship.

Cases 2 and 3 show how hysterical prolongation and exaggeration can coexist. The symptoms in such cases are at least partially under conscious control, and to this extent will respond to alterations in incentive, to concessions, discipline, and deprivations. Here, again, if treatment is not too long delayed return to duty is often possible.

4. Hysterical Simulation

The "patient" classified under this category wishes to convince others that he is ill without himself really believing it. In the majority of cases the distinction between hysteria and malingering can be made fairly easily; but there is a borderland where endless discussion is possible over the degree of "conscious escapism" present, or whether a certain patient's loss of memory is "really genuine," or whether another patient can't hear or won't hear or can't hear because he won't. The practical issue, in the Services, is to distinguish as quickly as possible those who will make a satisfactory adjustment to Service demands and discipline after, on the one hand, a reasonable period of treatment or, on the other, disciplinary measures, from those who, even after the appropriate procedure has been carried out, will not make the adjustment. Kretschmer (1917), in a study based on German military psychiatric cases of the last war, deprecated attempts at a sharp aetiological distinction between hysteria and simulation, preferring to regard them as alternative paths open to persons of hysterical disposition. He stressed the importance of estimating separately in each case (1) the significance of the hysterical symptoms in the setting in which they occur—that is, in relation to any underlying disorder, and (2) the "health-conscience" (Gesundheitswille), or attitude of the patient towards illness, his readiness or unwillingness to succumb to minor ailments and discomforts.

Discipline is specific for malingering, and rapid diagnosis and prompt treatment provide effective prophylaxis. Malingering is rare in the Navy as a whole, and when it does occur ships' doctors are quick to recognize it and thereby prevent needless and harmful stay in hospital. Hence this diagnosis has been almost unknown during the first eighteen months of work in the neuro-psychiatric unit of our naval hospital. In civilian practice opportunities to apply discipline are limited: an explanation to relatives and injunctions to substitute firmness for sympathy, together with instructions to the patient to remain at work, are all that is usually possible. In the Services we are fortunate in having disciplinary measures available, comprising simple return to duty, return to duty with restriction of privileges, or actual punishment. One or other of these possibilities often provides the best treatment for certain cases of hysteria. To apply them in the wrong place or at the wrong time, however, will cause much suffering and may lead to serious mental breakdown. Like many of the most effective remedies of general medicine and surgery, discipline applied without proper discretion may be extremely harmful and, as when it precipitates suicide, actually lethal. The following is an illustrative case.

Case 4. Chronic Pathological Anxiety.—An able seaman aged 25 was admitted complaining of loss of self-confidence and inability to do his work. He joined the Navy in 1934 for seven years' service; three years ago he married, and since then he had been very keen to return to civilian life as soon as possible. During this war, which put an end to his hope of retiring in 1941, he had been engaged in submarine detection with convoys. In July, 1940, he left his ship without leave and made his way to his home town. He could not explain his unexpected arrival, so his brother fetched a doctor, and he was taken to a civilian hospital, where the diagnosis of a hysterical fugue was made. The presence of a very strong incentive was obvious, and the alternative diagnosis of desertion had to be most seriously considered when he was transferred to this hospital. Psychiatric examination, however, revealed a long-standing condition of pathological anxiety that began before he joined the Navy and was aggravated by the strain of duties for which he was barely intelligent enough and was temperamentally unsuited, and by the unresolved conflict between his desire to return to civilian life and his obligation to continue in the Service. The "genuineness" of his fugue was an issue of no practical importance, since on admission to hospital the anxiety and depression resulting from these constitutional weaknesses and topical conflicts had taken such a hold on him that invaliding was necessary, and even this, with its promise of release, caused no real improvement. In this man the escapist motive had been in the forefront of consciousness for a considerable time, but it was not effective until a fairly long struggle between his personal wish and ethical demands had seriously impaired his none too robust mental health.

5. Hysterical "Complications" of an Underlying Disorder

These conditions differ from Categories 2 and 3 in that the underlying disorder does not determine the form of the hysterical symptoms. The latter represent a secondary reaction produced by the operation of increased or prolonged stress upon an already impaired or a congenitally inadequate mental or physical constitution.

Case 5. Mental Backwardness with Hysterical Paralyses.—An able seaman aged 44, recalled after twelve years of civilian life, was admitted complaining of his left leg repeatedly "giving way without warning" during the last few months. No organic disease was found in the nervous system, and the only physical abnormality was an achlorhydric dyspepsia. His recurrent paralyses were undoubtedly hysterical, but recall

had rescued him and his family from a long period of insecurity due to irregular employment; he had been glad to go back and was not an "escapist." About three years ago, during a period of great domestic difficulty, similar symptoms had developed. He proved to be mentally backward: he had only reached Standard II at school at the age of 14, and his mental age by the Kent emergency test (modified for English use) was 9 years. He had been able to carry out routine duties in peacetime, but the conditions of service in a destroyer in wartime, with the long hours and responsibilities of watch-keeping, brought him up against his intellectual inadequacy. He became anxious and depressed, and his hysterical disability relieved an intolerable situation. He was wholly unaware of the origin of his symptoms. The most that could be expected of him in modern warfare was a simple job ashore.

Case 6. Endogenous Depression with Hysterical Fugue.—A conscript recruit 25 years of age, this patient in civilian life was a milk roundsman, and on two occasions in the past five years his barrow had been found abandoned in the street and he himself had been brought home by the police after wandering many miles into the country. Each of these incidents had preceded a depressive illness lasting about three months, during which he had been unable to work. There seemed to be no adequate psychogenic cause for these attacks, and both previously and in the intervening period he had been a satisfactory worker. The occasion of his admission to hospital in June, 1940, was his arrest by the military police when wandering without leave in a prohibited area many miles from his depot. A charge of desertion was made, but he was referred for psychiatric investigation. On admission he was depressed and retarded; his depression gradually lifted, and after two months in hospital he was bright and active. His normal personality was not hysterical, and the illness followed a course precisely similar to the description he gave of the two previous attacks. On the evidence the basic condition was considered to be a liability to recurrent attacks of endogenous depression, and, although he had completely recovered, he was invalided on account of the risk of a further breakdown. The wandering which heralded his depressive attacks was associated with amnesia, and it appeared to be a genuine instance of dissociation: on the first and second occasions, at any rate, there was no question of a conscious motive, and on the third it was unlikely that there was one. It is probable that an early stage of depression and retardation shortly preceded each of the dissociative episodes.

In neither of these cases, nor in Case 4, could a resort to discipline have had any result but to aggravate and prolong the illness, with a risk, at least in Cases 4 and 6, of precipitating a suicidal depression. Among the hysterical "complications" of depressive and anxiety reactions fugues have been fairly common. In a number of these cases in which a charge of desertion has been made the question has been answered in favour of the patient as the result of finding other objective signs of psychiatric disorder of a graver kind. To this group also belong most of the cases of pseudo-dementia and the few cases of Ganser syndrome that we have seen in this unit. In some instances a poor school record and an account from messmates and superiors of a genuine difficulty in learning and carrying out duties may indicate the presence of mental backwardness. In others one or more of the physical concomitants—loss of weight, fine tremor, raised pulse rate, raised systolic blood pressure, or dilated pupils—together with insomnia or recurrent dreams, may point to pathological anxiety. In others, again, some loss of interest or slowing up of thought and action, reduced self-confidence, irritability, constipation, and loss of appetite may reveal an underlying depression, recognition of which will set the more superficial and more striking hysterical symptoms in correct perspective. Hysterical symptoms have also occasionally been met with engrafted upon cerebral arteriosclerosis, cerebral syphilis, alcoholism, and schizophrenia. Indeed, patients who show a complete absence of hysterical features are rare in wartime psychiatry. The exceptions are striking. Occasionally men are admitted, having been sent sick against their will when observed to be severely disabled by anxiety or depressive reactions, who in the presence of the most intense objective symptoms and with excellent insight retain an unshaken morale. In many of these men the will to return to duty is weakened by the long period in hospital which their treatment inevitably demands; others are completely resistant to the hysterical utilization of their symptoms, and throughout their illness are ready to fulfil without hesitation any demands that might be made of them.

Of those patients in whom the hysterical manifestations are of secondary importance and who become fit to return to duty, as well as of those showing hysterical prolongation or exaggeration, many need certain concessions—e.g., a recommendation for drafting to a larger ship, a period of shore service, or a change of work—if they are to continue as useful members of the Service. Their value to the Service has to be balanced against the inconvenience and the danger of creating a precedent involved by the concession demanded.

Two further criteria—the family history and home atmosphere and the personality and past record—have been found helpful in assessing the likelihood of a satisfactory adjustment to Service demands.

Family History and Home Atmosphere

First, an inquiry is made into mental or nervous illness suffered by any close blood relation, and any marked personality characteristics. The occurrence of depressive, schizophrenic, or "neurasthenic" illness, for example, in such relations will prompt a search for signs of a more serious underlying disorder in the hysterical patient. Secondly, a picture is obtained of the economic standards and "work-conscience" of the family as a whole, and the patient's attitude and relation to these standards are ascertained. Is there a tradition of steady work and social reliability in the family? Is the patient above or below the average level of his parents and siblings in these respects? Is he temperamentally similar to the other members of his family, or in some way different from them—more dependent, for example? What was his school career in comparison with those of his brothers and sisters?

The facts thus elicited are of value in diagnosis in that they may lead to the assessing of the hysterical symptoms as a complication of some more fundamental instability based on inherited or early environmental factors. They also help in prognosis: the prognostic significance of a depressive psychosis of known duration in a brother or sister or of chronic invalidism in the father following "shell-shock" or "D.A.H." in the last war need not be emphasized, although it calls for careful evaluation. Both the inherited constitution and the patient's reaction to the level of "health conscience" prevailing in his family must be taken into account.

The Personality and Past Record

It is useful to make a distinction between hysterical symptoms arising in a setting of psychopathy and those which, as in the cases so far described, either complicate some other form of psychiatric disorder or are more or less isolated occurrences in a fairly stable personality. Here, as in Category 4, while the presenting symptoms may be produced by simple dissociation, prolongation, exaggeration, or simulation, the main prognostic criterion is the intensity of the underlying disorder—in this case of psychopathy. Of the multitude of traits and characteristics which have been described as part of the hysterical personality two at least have been too commonly met with for mention of them to be omitted in the consideration of

these cases: (*a*) a defective "health conscience," and (*b*) a desire to be the centre of attention and to obtain more appreciation from the community than is earned by actual social and personal value. A past history of neurotic traits in childhood and difficulties in adjusting to school life, as well as an unsatisfactory work record with many changes of job and much time off for minor ailments, is commonly found among hysterical psychopaths. A large number of those who broke down had never, on account of ill-health, inefficiency, or distaste, held a job for long in civilian life.

Case 7.—A Newfoundlander enlisted with most of the eligible men in his village in January, 1940. His application was a half-hearted gesture which both he and his mother and, as he said, the whole village were astonished and dismayed to find successful. He had been known for years as a semi-invalid, taking after his father, who had twice been a patient in a mental hospital. He had given up one job after another because it was too strenuous, and his work record consisted of short periods in labouring and farming jobs, long-shore fishing, and fish-packing, interspersed by considerable intervals for rest and recuperation. On arrival in this country his humble position, the disappointing pay, and the lack of interest in his hypochondriacal complaints shown by his messmates and superiors in the training depot provoked an intense resentment against the authorities who passed him as physically fit to join up. After a few weeks he reported at the sick bay complaining of pain in the back, which he alleged had been brought on by rifle drill, and frequency of micturition. Full urinary investigation was carried out, including even an intravenous pyelogram and a radiograph of the spine and renal areas: no physical abnormality whatever was discovered. On admission to the Royal Naval Auxiliary Hospital his mental state can be briefly described as disgruntled petulance. He was completely taken up with his own symptoms and disappointments; he showed no interest in the war news or the other patients, worked mechanically in the occupational department, and went through the movements in the physical-training class in feeble apathy. He made no improvement at all until the decision to invalid and repatriate him was made.

Case 8.—An ordinary seaman aged 25 volunteered after a minor quarrel with his wife in April, 1940. In July he got his first draft, to a small submarine-chaser. For the whole of the two months he was with her she was in harbour fitting out, and only twice went to sea on trials. He was terrified by heavy air raids on the harbour, and one night, returning from leave, he collapsed in the street and was taken to hospital by the police. Shortly afterwards he was given sick leave: he went home, and overstayed his leave because he "could not face it again." He could not explain to his relatives his remaining at home, so he spent three days wandering round the city without food and then reported at the local naval depot. He was sent from there to our hospital. He looked and played the part of a hopeless and beaten man; his voice was rather ungenuinely tremulous and tears were "not far away." He said he would rather go to gaol than return to duty and that he had been foolish not to plead conscientious objection. He showed none of the physical signs of anxiety, and slept well without drugs. He made no complaint of illness: "Just funk, I suppose; it's a rotten way to be, but whenever I think of going back my stomach turns over and over." He was of average intelligence and his work record in civil life had been fairly good, although he had always looked for jobs near his home, as he was very dependent upon the sympathy of his family. His personality was immature and egocentric, and his freedom from "symptoms" appeared to spring from a complete absence of struggle against his fears. He showed no sense of social responsibility and spent much of his time in hospital spreading discontent and resentment among the patients. In such a case as this the role of the doctor can only be to report his findings and to advise the executive authorities, with whom the final decision as to disposal must lie.

Case 7 is an example of defective "health conscience"; Case 8, of defective morale. A description of the latter case is given although it cannot be classified as hysterical, because here, as with the typical hysterical psychopath, failure in the Service was an expression of the inadequacy of the total personality. Both cases illustrate a very serious problem of disposal. No medical treatment is of any use, and if these men were sent back to duty further psychopathic developments would be certain to occur and the lives of others might be endangered. Discharged to civilian life, they are a living invitation to seek escape through "neurosis" and a burden on the community. No satisfactory disposal is available: rejection at the recruiting station, or as early as possible during training, and direct drafting to a labour camp or rehabilitation centre, where suitable manual work is done under modified Service discipline, is urgently called for. Such centres would be valuable for many types of case besides those described here. Cases of deficient morale are uncommon, but the hysterical psychopath has often been met with among new recruits. Work and discipline are the best treatment for both, and when similar cases in the other Services are taken into account the problem is already large enough to justify prompt action. The enlistment, training, and hospital treatment of such men are an extravagance which, if it could be afforded in the past, must eventually be terminated by increasing financial stringency and demands for labour.

Summary

A brief description is given of some hysterical reactions and one case of defective morale which have been seen in the naval psychiatric service. An attempt is made to classify such reactions by means of an assessment of the symptoms in the setting in which they occur. This has been found to facilitate prognosis and appropriate disposal. The more general question is raised of the most useful and economical disposal of the psychopath in wartime.

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THE STABILITY OF TETANUS ANTITOXIN UNDER SUBOPTIMAL STORAGE CONDITIONS

BY

C. RUSSELL AMIES, M.D., D.T.M.&H.

(From the Serum Department, Lister Institute, Elstree)

Under normal conditions it is the usual practice to store sera and other immunological products at a temperature slightly above 0° C. At present, however, stocks of tetanus antitoxin and other sera have to be maintained at civilian first-aid posts and dispensaries where refrigerators are not available. Moreover, under war conditions it is not always possible to obtain cold-storage on ships carrying supplies of serum over-seas. It is therefore a matter of importance to know the rate at which antisera deteriorate under suboptimal storage conditions. Some information on this subject is already available, but the results obtained by earlier workers were derived from the study of sera of low titre, and it cannot be assumed that these apply to sera of high potency obtained by improved methods of immunization. It may therefore serve a useful purpose to record the results of some recent investigations of this problem.

The effect of temperature has been studied more completely on diphtheria antitoxin than on other antisera. Anderson (1910) and MacConkey (1913, 1917) reported that diphtheria antitoxin lost about 6% of its activity after being stored for a year in the refrigerator and about 10% per annum at 15° C. MacConkey (1913) also found that this antitoxin when stored at 36° C. lost half of its activity

in a year; while Glenny (1913) reported that antitoxin stored at 37° C. for four and a half years had lost 82% of its activity, and over 90% after seven years. Results with tetanus antitoxin concentrated by the Banzhaf-Gibson method, still employed in a modified form in some serum laboratories, indicate that this antitoxin has a similar heat-inactivation rate.

The material for the present study consisted of samples of unconcentrated antitoxin from individual horses or from large pools representing several bleedings from a group of twelve to twenty animals. All the samples contained 0.35% of cresol as a preservative. Some were kept in the laboratory under known conditions of temperature, while others were samples returned from first-aid posts and dispensaries. The conditions to which these latter had been subjected were not precisely known, but it was considered that the analysis of such random samples should give a fair indication of the effect of storage under the actual conditions of distribution. All the assays were carried out on guinea-pigs at the L+/5 level, the same test-toxin being used throughout.

Control Series: Storage in the Cold, at Room Temperature, and at 37° C.

Two horses, "Equa" and "Calidus," received the same course of immunization with tetanus toxoid and alum. Samples of the serum from each horse were stored (in rubber-capped 50-ml. bottles) in the cold room at 2° to 4° C., in a glass-fronted cupboard in one of the laboratories where the seasonal variation in temperature is between 10° and 25° C., and in an incubator maintained at 37° C. The samples remained under these conditions for one year, the potency of each being tested at frequent intervals during this period. For the sake of brevity, however, only the initial and final titres are given.

Potency of Serum in International Units

	Serum "Equa" stored at			Serum "Calidus" stored at		
	2°–4° C.	Room Temperature	37° C.	2°–4° C.	Room Temperature	37° C.
At start of experiment	8,000	8,000	8,000	1,350	1,350	1,350
After 1 year	8,000	7,250	4,200	1,300	1,250	750
Loss	Nil	9%	47%	4%	7%	44%

Tests on Returned Samples

A batch of unconcentrated tetanus antitoxin designated No. 423 was issued to various centres acting as medical stores for the A.R.P. services. From time to time bottles of this antitoxin were returned, and these were tested to determine the fall in potency which had occurred. Samples of this same batch of antitoxin were kept in the laboratory at room temperature (10° to 25° C.) and in the cold room, and these were also tested at intervals. The results may be summarized as follows:

			Percentage Loss
1	Batch No. 423, original test	1,300 I.U./ml	—
2	Retested after 2 years at 2–4° C.	1,200 "	8
3	Retested after 2 years at room temperature	950 "	27
4	Samples returned after 2 years:		
	9 samples from different centres	1,200 "	8
	4 " " "	1,100 "	15
	2 " " "	1,000 "	23

The greater loss found in the sample that was maintained in the laboratory at room temperature was probably due to the fact that the room was furnished with skylights and consequently became very warm during the summer.

The Effect of Freezing

It is commonly believed that the freezing of an antiserum results in a considerable fall in antibody titre. This is said to arise from the denaturation of the antibody globulin by the phenol or cresol preservative, the effective concentration of which is considerably increased when the water separates out in the form of ice. Glenny, Pope, Waddington, and Wallace (1925) have shown that this phenomenon is responsible for the increased toxicity observed in toxin-antitoxin mixtures used for diphtheria prophylaxis. This, however, must be regarded as a special case, because carefully controlled experiments with a number of different antitoxins and anti-bacterial sera have failed to show any appreciable diminution of potency as the result of repeated freezing and thawing. Sealed glass ampoules very rarely break when their contents become frozen, since the air space in the neck of the ampoule allows the fluid to expand before it freezes. The rubber caps employed to seal multiple-dose containers may, however, be forced off if insufficient air space is provided. If these mechanical risks are avoided the contents of a bottle or ampoule which has been frozen may be used with full confidence that no appreciable deterioration of the antibody has occurred.

Conclusion

Tetanus antitoxin in the form of natural horse serum loses less than 10% of its potency per annum when kept at room temperature under reasonably good conditions. Samples maintained at 37° C. for a year lost less than 50% of their activity. These results are in agreement with those obtained by other investigators. The freezing of serum containing 0.35% cresol has no appreciable effect upon the antibody.

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Clinical Memoranda

Peripheral Neuritis and Acute Rheumatism

The interest of the following case lies in the rarity of polyneuritis as a complication of acute rheumatism.

CASE HISTORY

A pale stout boy aged 10 was admitted to the rheumatism unit of Queen Mary's Hospital, Carshalton, on August 3, 1939. His former history was that he had been operated on at the end of May, 1939, for acute appendicitis. Shortly afterwards he complained of pain in one wrist. Joint pains spread and persisted, and he was transferred to Carshalton. There was no previous history of rheumatism.

On admission the child looked ill. The skin was unusually dry, and he had a malar flush. He was apyrexial; no signs of chorea and no rheumatic nodules were present. There was a collapsing pulse and clear evidence of mitral and aortic incompetence. It is of interest to note that no evidence of aortic disease was observed on July 20. During the next few days he became dyspnoeic, was very difficult with his food, and vomited occasionally. There was no cyanosis or oedema of the legs. On October 16 he began to be incontinent of faeces. Control was regained about a week later. On October 26 bilateral drop-foot was noted. All the muscles below the knees were wasted, and the tendon and plantar reflexes were absent. There was diminished sensibility below the knees, and the muscles were tender on pressure. At this time the boy became very awkward in the use of his hands. This suggested chorea, but marked muscular wasting was observed here also. The cerebrospinal fluid was examined on two occasions and was not abnormal.

The patient was treated with vitamin B_1 in the form of betaxan; 450 mg. was given over a period of seven weeks, and during that time he also received bemax. Salicylates

were given in moderate dosage, but not continuously. There was no noticeable improvement in the neuritis, and the general condition steadily deteriorated. On February 26, 1940, oedema of the legs and considerable hepatic enlargement were seen. The patient died on March 3.

Discussion

In chorea mollis there is not the same degree of wasting and there is choreiform movement at some stage. The only symptom in our case suggesting chorea was the clumsiness of the fingers. This was attributed to the obvious muscular atrophy. The absence of knee- and ankle-jerks is again the opposite of what is usually found in chorea. There was no palatal palsy to suggest a diphtheritic lesion, and no family history of ataxia.

Gordinier (1891) described a case of acute rheumatism in a man, aged 31, of temperate habits. The onset was with typical pain and swelling of both ankles and one elbow and shoulder. Three months later there developed weakness and wasting of all four limbs, bilateral drop-foot and wrist-drop, and signs of mitral stenosis. Hypo-algesia over the inner aspect of the forearm and outer sides of the ankles was also present. The knee-jerks were absent. Signs of pericarditis developed before death after an illness lasting four months altogether. The post-mortem examination showed a fibrinous pericarditis, mitral stenosis, and aortic stenosis. The ulnar, musculo-spiral, and anterior crural nerve trunks appeared swollen and congested. There was microscopical evidence of parenchymatous degeneration and interstitial neuritis. No changes were seen in the anterior horn cells of the cord. Pierret (1912) reported the case of a man aged 29 who during convalescence from two separate attacks of acute rheumatism developed brachial neuritis with pain and paralysis of the left deltoid and extensors of the wrist. Reinhold (1926) described an attack of acute rheumatism in a man aged 21 who developed a total left facial palsy. Morquio (1930) reported the case of a child aged 12 whose main rheumatic symptom was torticollis. She developed signs of a mitral affection and, six weeks from the onset, a complete paralysis of the right hypoglossal nerve. There was a permanent hemiatrophy of the tongue.

In the adult it is important to exclude an alcoholic or other toxic aetiology. Bouchut, Froment, and Badinand (1936) described the case of a woman aged 44, "paraissant pas entachée d'éthylisme," who presented signs of mitral incompetence together with absent tendon reflexes in arms and legs, awkwardness of the fingers, and aphonia from left recurrent paralysis. The aphonia persisted for two months and the reflexes were absent for two years, during which she was severely ill with pericarditis and effusion, pleural effusion, and auricular fibrillation. She ultimately recovered.

Gounelle and Warter (1937) reported the case of a youth of 18 who developed paralysis of the anterior leg muscles during a severe attack of acute rheumatism. The knee-jerks were unaffected, but the ankle-jerks and plantars were absent. Incontinence of urine occurred in the seventh week. The cardiac lesion was aortic incompetence with pericarditis. He was given 150 grains of salicylate daily for eight weeks and physiotherapy in the form of hot baths, hot-air baths, and galvanism during convalescence. The paralysis was completely cured in eight months.

From this short series of cases it would seem that peripheral neuritis or polyneuritis may occur in the course of the more severe attacks of acute rheumatism. This complication does not seem to influence the ultimate prognosis. In my case treatment with the antineuritic vitamin was without noticeable effect. Perhaps better results might be obtained from the higher dosage of salicylates employed on the Continent.

I have to thank the Chief Medical Officer, London County Council, for permission to publish this case.

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Reviews

HUMAN PARASITOLOGY

The Parasites of Man in Temperate Climates. By Thomas W. M. Cameron, M.A., D.Sc., Ph.D., M.R.C.V.S. (Pp. 182.) Toronto: University of Toronto Press. 1940.

The author of this short textbook is professor of parasitology in McGill University, and the work is based on the lectures on animal parasitology given there to the students in the medical school. Detailed accounts are given of those parasites which occur in North America and Great Britain, and brief accounts of others which may from time to time be introduced from the Tropics. The book is intended, therefore, for the medical man who practises in the English-speaking temperate and subtropical zones. In his preface the author points out that so far parasitology as a subject commensurate with bacteriology has been taught only in schools of tropical medicine. Parasites, however, are not confined to the Tropics; moreover, owing to more rapid and frequent communication between temperate and tropical countries it is increasingly important for medical men to have some knowledge of diseases which occur outside their immediate environment.

The parasites described belong to the protozoa, helminths, leeches, and arthropods. The intestinal protozoa are dealt with in a clear but concise manner. The subject of malaria is fully described and includes a summary of the chemotherapy of the disease as given in the report of the Malaria Commission of the League of Nations. The section on helminths is the largest and possibly the most useful in the book. A description is given of modern methods for the diagnosis of *Enterobius vermicularis* infestation. A very full account is given of *Trichinella spiralis*, an important parasite in many temperate climates; thus, it is stated, a recent survey shows an infestation rate of 17% among the inhabitants of the U.S.A. The morphology and life-history of the worm, the diagnosis and symptoms, and the methods of prevention of the disease are all very completely described. The author considers that rats are not an important source of infection to pigs, but that uncooked garbage containing scraps of infected pork is the main source of infection in these animals. Man is infected most usually by eating undercooked pork.

The hookworms and the disease caused by them are also very fully dealt with. In the description of *Strongyloides stercoralis* no mention is made of the discovery by Kreis and Faust of the parasitic male worm. The section on arthropods is practical and concise, and contains, in addition to numerous line drawings, some very beautiful half-tone illustrations.

The book is well produced, being printed on excellent paper, and gives a clear account of the limited number of parasites most commonly met with in temperate zones.

BLOOD COAGULATION IN HEALTH AND DISEASE

Hemorrhagic Diseases. Photo-Electric Study of Blood Coagulability. By Kaare K. Nygaard, M.D. (Pp. 320; illustrated. 28s. net.) London: Henry Kimpton. 1941.

This work is not a textbook on the haemorrhagic diseases but, as its subtitle indicates, a highly technical study of the coagulation of the blood in health and disease. Having cleared away any possibility of misunderstanding of its purpose, we should like to go on at once to say that it is an extremely valuable addition to the literature of haematology. Dr. Nygaard has himself been engaged in investiga-

tions on blood coagulation for the last ten years, and in addition he has reviewed the literature. His book has been completed at a fortunate moment, for we appear to be on the eve of considerable advances in knowledge of the haemorrhagic diseases, as witness recent work on prothrombin, vitamins C, K, and P, and the action of snake venom. Coagulation is normally a potential quality of the blood, which is manifested only *in vitro*. It therefore depends not only on intrinsic haematological factors but on external non-haematological factors. From the technical point of view much depends on the simplification and standardization of these extrinsic factors, and most haematologists who have worked in this field will agree with Dr. Nygaard that blood coagulation is best studied by means of recalcification of the citrated or oxalated plasma.

Methods of studying coagulation can be roughly divided into those which depend on alterations in viscosity and optical methods. When plasma coagulates it becomes more opaque, and Dr. Nygaard has devised a photo-electric method by which it is possible to make a permanent record or *coagelgram* with time markings of this process. With this technique coagulation can be divided into four phases: the period of dissociation or latent period, the period of fibrin formation, the rest period, and the period of clot retraction. The method can easily be adapted to the estimation of accelerated clotting or prothrombin times. After discussing the various conditions which modify coagulation *in vitro*, Dr. Nygaard goes on to show that coagulation is prolonged in haemophilia, thrombocytopenic purpura, and prothrombin deficiency; the last being most commonly found in jaundice and melaena neonatorum. The evidence suggests that in both haemophilia and thrombocytopenic purpura the fault is due to deficiency in the thromboplastin or tissue extract factor.

The writing is lucid, and the author has a disarming modesty, but we believe he is justified in his hope of having made a constructive contribution to his subject.

BROMPTON REPORTS

Brompton Hospital Reports. A Collection of Papers recently published from the Hospital. Volume IX, 1940. Published by the Research Department of the Hospital. Copies can be had from the Secretary, the Hospital for Consumption, Brompton, London, S.W.3, price 5s. 7d., post free.

A further batch of papers recently published by members of the staff of the Brompton Hospital have been collected in Volume IX of the *Brompton Hospital Reports*. Of topical interest are two papers on war injuries of the chest and on the late effects of penetrating wounds of the chest by J. E. H. Roberts and C. Price Thomas respectively. In another article Mr. Roberts discusses primary carcinoma of the lung; he stresses the importance of recognizing and investigating the early symptoms of this by no means rare disease (230 cases reached the Brompton and St. Bartholomew's Hospitals in 1938) if surgical therapy is to prove of avail. In a paper entitled "The Diagnosis of Pulmonary Tuberculosis without Bacteriological Confirmation: Clinical Aspects," J. G. Scadding in effect ably discusses the differential diagnosis of pulmonary tuberculosis with emphasis on the atypical forms of pneumonia, to the study of which he has given detailed attention. Various aspects of tuberculosis form the subjects of most of the remaining papers: contact infection in childhood, prevention of pulmonary tuberculosis, its treatment by phrenic paralysis, the termination of artificial pneumothorax, the relation between pulmonary tuberculosis and pregnancy, and tuberculous tracheo-bronchitis. A long article on the relation between chronic iridocyclitis and tuberculosis, by W. D. W. Brooks, F. A. Juler, and E. R. Williams, will stimulate interest in the subject; but the evidence presented cannot be considered sufficient to establish tuberculosis as the cause of the condition unless we assume that the tubercle bacillus or some form of this organism is capable of producing tissue reactions different from those usually found. An illustrated article on diseases of the middle lobe of the right lung and interesting case reports complete the contents of the volume. The usual statistical tables summarizing the work of the hospital have been omitted this time, no doubt because of the extent the war has interfered with that work.

FEAR AND FAITH

Fears may be Liars. By John A. Ryle, M.D. (Pp. 95. 3s. 6d. net.) London: George Allen and Unwin, Ltd. 1941.

That fear is defensive and pain protective in origin may well be recognized in medical circles, but it is good, particularly at the present moment, that the implications from this dictum should be elaborated in language suited to the general reader. Taking his title from Clough, Professor Ryle has done this in *Fears may be Liars*, and comes to conclusions that might be summarized in Sir Philip Sidney's words, "Fear is more pain than is the pain it fears." The Elizabethans feared death as the end of an exciting adventure, the Victorians compensated for that fear by absorbing interest in personal immortality; here is a creed expressed in terms which will comfort and reassure those to whom the dogmas and consolations of orthodox religion have ceased to carry conviction, combined with medical evidence that deprives the moment of death of much of its sting. To this is added a robust faith in the value of life, and a zest for living not merely as an individual but as a member of a community that will persist. That fear may be best resolved by effective and collective action is a lesson we are all learning to-day. When Sir Edward Grey said in 1914 "the lights in Europe are going out one by one" he was more prophetic than he knew, and this book has been written, in the author's own words, "for ordinary men and women who, in this their finest hour, yet find themselves groping in the black-out of the mind for a match or a torch to guide them towards a friendly door." A tract for the times, sympathetically conceived and finely expressed.

Notes on Books

A second edition of *The Care of the Aged, the Dying, and the Dead*, by Dr. ALFRED WORCESTER, is published in this country by Baillière, Tindall and Cox. The text of this book is contained in seventy-four pages and about 15,000 words. The price charged for it is 8s., which, making allowance for transit across the Atlantic in wartime, is too high for most pockets. A single reading will be of value to many, and it is a pleasant exercise, for the American publishers have fulfilled their desire to present a volume which, as to type, paper, and binding, is appropriate and satisfactory, and the author's style is agreeable and easy. On its first appearance in 1935 the book was reviewed in this *Journal*. The fact of a second edition being published shows that it performs a useful service in directing attention to certain regions of medical practice which are neglected in most ordinary textbooks. It is intended mainly for the instruction of senior students and young practitioners in the art of practice rather than as any contribution to the science of medicine. The author's suggestion of the need for specialization in the field of practice dealt with can scarcely be approved; but if the reader is not offended by his initial statements that "the advance of medicine is now furthered only by specialists" and that in the particular fields of the general practitioner "neither medical science nor the art of practice advances," and if he will allow

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for a not infrequent exaggeration of statement, he will find in its three chapters some sound and helpful suggestions which increasing experience will enable him to profit by and to extend.

Messrs. A. and C. Black, Ltd., have issued a new series of little books entitled *Nature at Work*, by E. M. STEPHENSON, M.Sc., in which "Nature study is blended with a simple account of farming and gardening activities." They are intended to be read by junior pupils from 7 to 11 years of age, and constitute an admirable and attractive introduction to the subject. They are suitable for use in both urban and rural schools. Book III (2s.) has been sent to us for notice, and it seems excellent for its purpose and likely to attract and enhance the interest of junior scholars in Nature study. Its subjects and the order of their consideration are miscellaneous rather than systematic. They include the soil and the farm, the sea-shore and the fish shop, and, of course, both plants and animals. Illustrations are abundant and appropriate. Though there are only three books in this series there is a more substantial small volume entitled *Nature Study and Rural Science*, by the same author (3s.), issued as a teacher's book for a four-years course. This is excellently designed and should prove of very great value to the teacher in arranging and conducting such a scheme of work. It contains hints for preliminary lessons, a commentary on each book of the series amplifying the text and exercises and suggesting further practical work, together with a scheme for suitable field work.

A new edition of Dr. E. B. CLAYTON'S *Actinotherapy and Diathermy for the Student* has been published by Baillière, Tindall and Cox at 8s. 6d. It is a pleasant and practical outline for students of massage. Since the publication of the first edition, short-wave diathermy has been added to the syllabus of the C.S.M.M.G. examination, and the last chapter, dealing with this subject, has accordingly been rewritten. The book will prove of real value to those for whom it is intended, both in preparing for examination and in the earlier years of practice after qualification.

Preparations and Appliances

STRETCHER-SLING FOR USE IN CASUALTY EVACUATION TRAINS

Dr. M. HAWKE (train medical officer, Casualty Evacuation Train No. 9, Ministry of Health) writes:

Since the beginning of the war various methods have been suggested for suspending and reinforcing stretchers in casualty evacuation trains, and the accompanying diagrams illustrate a new type of stretcher sling which combines the merits of extreme simplicity and economy.

Each sling is made by splicing with four tucks a length of white sisal rope measuring approximately three yards, and

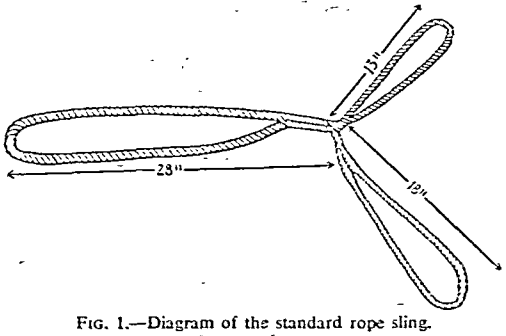


FIG. 1.—Diagram of the standard rope sling.

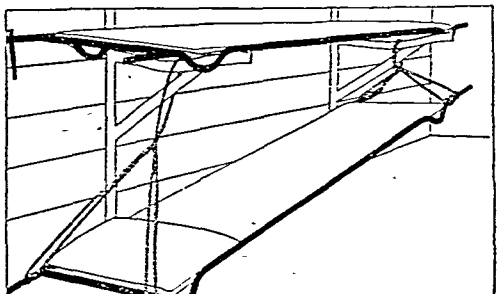


FIG. 2.—Foot of stretcher raised nine inches; head of stretcher raised three inches.

thereby producing three loops, as shown in Fig. 1 of the accompanying illustrations. A single strand of this rope will support over 18 cwt., and will stretch to the extent of only 5%. It will be observed that by varying the method of application, and also the number of turns of the loops in relation to the supporting stretcher handle, a patient can be supported, or suspended in the stretcher, in almost any desired position. These slings serve the important function of insulating the stretcher and its occupant from vibration when the train is in motion, and they also serve, with the assistance of rolled

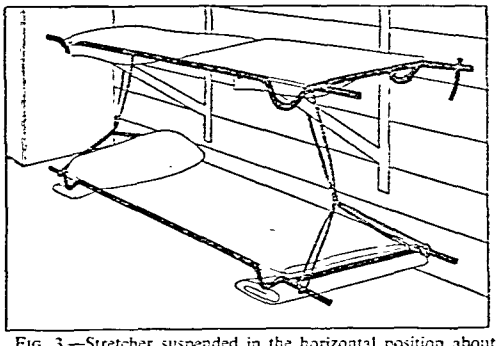


FIG. 3.—Stretcher suspended in the horizontal position about four inches from floor of coach. Swaying is prevented by placing a rolled blanket under each end of stretcher.

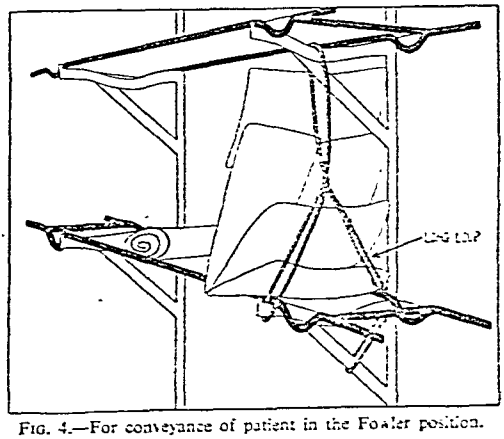


FIG. 4.—For conveyance of patient in the Fowler position.

blankets or pillows, as efficient but less cumbersome substitutes for bed-rests.

I gratefully acknowledge the courtesy of the Hospital Officer, Ministry of Health, Leeds, for permission to publish these notes, and would extend my appreciation to Messrs. British Ropes Ltd. for providing the necessary material for use throughout the train.

BRITISH MEDICAL JOURNAL
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CRYSTALLINE ENZYMES

It is a commonplace nowadays that maintenance of the life of all living things depends upon physical and chemical processes which are made possible by a series of catalysts elaborated by the organisms themselves. From this point of view the living body as a whole may be called an autocatalytic machine. Whereas these catalytic agents deal primarily with the normal necessities of the organism, it is remarkable how readily they can be adapted to deal with substances administered for various purposes and normally foreign to it. Although it is inevitable that we should study the catalytic reactions in the body separately, no significant picture of them will be obtained until they can be fitted into the total scheme of the living unit. The construction of such an understandable scheme will be a laborious process. At present a number of aspects of the subject have been clarified. The complicated system of enzymes, about whose nature and action there has been so much controversy, are vital to the sequence of metabolic events in the organism. From the present standpoint all these arguments seem a waste of energy. Until recently all the experiments were performed with very crude preparations; thus, although there may have been much truth in what each disputant maintained from his experiments, no finality could be reached until preparation of the pure enzyme was made possible.

When, in 1926, Sumner isolated from soya bean a crystalline cell catalyst which appeared to be identical with urease, the enzyme which rapidly decomposes urea into ammonia and carbon dioxide, a new field of enzyme research opened. Pepsin was isolated and crystallized shortly afterwards, and in the succeeding years pepsinogen, trypsin, and other pancreatic enzymes; papain (kathepsin), amylase, lysozyme, and others were crystallized. Northrop,[1] who has been in the forefront of this work, states that, so far as is known now, these enzymes are simple proteins—that is, they do not embody groups other than amino acids. The enzymes are catalysts of hydrolytic processes; for example, trypsin acting on proteins with the characteristic linkages (-CO-NH-) splits them and adds the molecule of water thus: $(-CO-NH-)+H_2O\rightarrow(-COOH)+(-NH_2)$. Catalase, an enzyme which catalyses the reaction $2H_2O_2\rightarrow2H_2O+O_2$, and tyrosinase, which splits the amino acid tyrosine to form derivatives of catechol, have also been isolated and crystallized. They differ in structure from the hydrolytic enzymes in that they are conjugated proteins (haemoglobin is a conjugated protein—the protein globin + the prosthetic group haematin).

The significance of these isolations and crystallizations of enzymes depends upon whether it can be demonstrated unequivocally that the substances obtained are chemical individuals and possess the specific properties attributed to the enzyme. So long as the purity is in doubt it is open to critics to object that the active enzyme is adsorbed on the protein and responsible for the activity. The criteria for purity of an organic compound cannot be applied to these enzyme proteins, or indeed to any protein. Hence other criteria must be used (for example, solubility curves) which are not absolutely satisfied even by such well-studied proteins as haemoglobin and egg albumen. If the deviations from theoretical requirements are no greater than those observed for the purest specimens of the latter, then comparative purity can be inferred. In at least one case (chymo-trypsinogen) the correspondence to theoretical requirements is very close and indicates that this protein is one of the purest ever isolated. Other methods (sedimentation in the ultra-centrifuge; rate of migration in the electrophoresis cell) are also used to test for purity of proteins, but are perhaps not so reliable as the solubility test. These various methods do not always give results consistent one with the other: thus crystalline pepsin, which appears to be a chemical individual by the sedimentation and electrophoresis test, is shown to consist of two or more components by the solubility test. Clearly more work is necessary to establish once and for all that enzymes are definite chemical individuals, though it looks as if it is a mere matter of time before this is done.

The familiar fact that heat destroys the activity of enzymes and that they have an optimum range of reaction (*p*H) for their activity is demonstrable also with the crystalline preparations. The fact that the crystalline preparations can be inactivated by other proteolytic enzymes also points to a very close relation between the protein and the enzyme. These and other findings suggest strongly that the enzymatic activity is vested in the protein molecule itself, but it is, as Northrop states, impossible at present to say what chemical structure is first responsible. By introducing certain groups and elements—for example, acetyl groups and iodine—into the molecule, and by determining the effect on activity, it can be shown that the free amine groups are not necessary for the activity, but that the phenolic groups (for example, the -OH in tyrosine) are. A very interesting consequence of the crystallization of enzymes has been the clearer picture that can now be obtained of the puzzling phenomenon of the activation of pancreatic trypsinogen. The older experimenters showed that freshly secreted pancreatic juice is inactive and is activated by the so-called enterokinase present in extracts of the small intestine. This classical experiment, using other pancreatic juice or amorphous preparation of pancreas, is repeated by every class of chemical physiology. It has now been demonstrated that amorphous preparations contain traces of a substance (this has also been isolated in crystalline form) that inhibits trypsin. Crystalline trypsinogen, however, freed from such inhibitor, is activated in neutral solution by the most minute trace of trypsin, and autocatalysis proceeds uninterruptedly. In the case of *in vivo* activation of pancreatic juice by enterokinase, the old controversy whether this is an enzymatic reaction or whether active trypsin is a compound of trypsinogen and kinase (stoichiometric view)

[1] *Johns Hopk. Hosp. Bull.*, 1940, 66, 207.

seems at least in part to have been cleared up. By using purified materials Kunitz has found that confusion arose because an inert protein and the active trypsin are formed simultaneously. The relative amounts of the two depend upon the acidity of the reaction mixture. The active trypsin preponderates in slightly acid condition, while the inactive protein appears in greatly increased quantities in neutral or slightly alkaline conditions. The isolation and crystallization of pepsinogen were followed by the proof, confirmatory of the earlier work on crude preparations, that it has no proteolytic activity, and that it is converted to active pepsin in slightly acid solution. The progress of the activation is made possible by the initial formation of a trace of pepsin, which then starts the activation of the remaining pepsinogen—that is, the reaction is autocatalytic. This activation is accompanied by a splitting-off of nitrogenous compounds, so it is probable that the formation of the active enzyme from the inactive precursor involves rupture of some of the peptide linkages in the latter.

Thus, with the progress made in the isolation and crystallization of what is likely to be established as the enzyme proper, and with the elucidation of the processes of activation of inactive precursors, enzyme action will be reduced to the physics and chemistry of a special kind of catalysis. These enzyme proteins must possess peculiarly active groups or configurations, perhaps made available for action by the characteristic temperatures and *p*H requirements, which permit of the formation of combinations with the substrates so that rupture at certain points of the molecule of the latter occurs rapidly in an aqueous medium. Much of the old ground will, we imagine, have to be gone over, using crystalline enzyme proteins, before a reasonable hypothesis is forthcoming. The great advance so far has been that enzymes need be regarded no longer as mysterious agents working in a way which puts the chemist to shame, but as clear-cut chemical entities which are amenable to the methods of investigation already familiar to us but requiring a much more profound understanding of protein chemistry and physics than we yet possess.

SOCIAL FACTORS IN MEDICINE

The correspondence which has appeared in our columns under the title "Medicine in a Changing World" reveals some difference of opinion as to the functions of the medical profession in relation to the community it serves. There can, at least, be no doubt about our duty to find out if individual patients are so affected by their physical environment or by mental stress that their recovery from somatic disease is hindered; and to compile and broadcast such scientifically ascertained facts as indicate the extent to which the well-being of the people is adversely influenced by social circumstances. In the field of nutrition, for instance, it is our task both to keep our patients right and to make known to the whole community the physiological facts and their relation to economic and social circumstances without knowledge of which they cannot properly order their lives. It was the work of James Lind that enabled Captain Cook to make his famous voyages with an unprecedented freedom of his crews from scurvy, and Lind and John Pringle showed by their rules of hygiene for the navy and army how typhus could be controlled in any community. About the same time Percival, Ferriar, Currie, Haygarth, and Thackrah were piling up evidence of the deleterious effect on health of the evil state of the towns and factories. The medical observations of these men led to their open advocacy of reforms which were later effected through the political efforts of men like Shaftesbury and the administrative persistence of Chadwick and Simon, himself the first medical man to hold high public office. But perhaps no single individual had more influence on the character of the great public health movement of the nineteenth century than John Snow, who appears to have been less concerned with propaganda than with proving by scientific inquiry that cholera was a water-borne disease. Whatever may be the best attitude for the profession in these matters there can be no question that the effect of environment on health and recovery from disease is a subject of intimate concern to them and that it ought to be in the forefront of their minds from the very beginning of their student days. In some of the provincial schools, and especially in the Scottish universities, where there was intimate contact with civic life, the older clinicians who had lived and worked through the squalor and epidemics of the industrial revolution carried their experience to the classroom and the bedside. But when sanitation had solved its grosser problems and public health became a specialty, students, if they were taught preventive medicine at all, were often bored with disquisitions on the technique of a subject they foresaw no prospect of practising. In spite of lip-service to the unity of preventive and curative medicine the practice of hygiene has increasingly parted ways with the practice of clinical medicine.

That there is a close connexion between successful therapy and the domestic and occupational surroundings of patients has been recognized in hospitals by the establishment of almoners, whose business it is to gather the facts for the use of the clinician and to try to establish so far as possible the milieu which will favour the maximum restoration to full health and least exposure to relapse. The Americans have accepted more whole-heartedly than we have the idea of the social service department in a hospital, and, above all, its place in the teaching of medical students.[1] And yet Dr. Edward L. Bortz, physician in the Lankenau Hospital, Philadelphia, deplores the fact that still only eleven medical schools in the U.S.A. arrange for their social workers to participate in the training of medical students.[2] From a study of 200 patients suffering from cardiovascular, diabetic, gastro-intestinal, respiratory, nervous, and other conditions, he concludes that 75% were affected by social circumstances aggravating their medical state and impeding their recovery. These ranged from absence of economic security, bad physical surroundings, physical strain, and lack of assistance, which are of the same order as those defects which engrossed the minds of our forerunners, to marital or family conflicts, fear of dependancy from sickness, uncongenial employment, solitude, and personal inadequacy (which presumably

[1] *British Medical Journal*, 1936, 2, 563.
[2] *Ann. Intern. Med.*, 1940, 14, 1765.

means inability to adapt oneself to a way of living). The community, of course, makes local provision for dealing with some of these problems. Bortz, however, is convinced that in many cases education of the patient and his family by the doctor with the assistance of the social worker is essential for any lasting improvement, and he also advocates an intensive and widespread educational campaign to impress upon the laity, rich and poor in all walks of life, that sound health is very largely a matter of their own responsibility.

Some additional means have to be found of reaching those whose interest is enlivened by the presence in their homes of an immediate medical problem, not of a nature or at a stage within the scope of hospital treatment. Here is the realm of the general practitioner, who learns by experience and knowledge of the families under his care how they are affected by minor strains and sorrows of life as well as the slings and arrows of outrageous fortune. He comes to know for his own area where to direct them for assistance. But he has to find out most of this for himself in the hard school of practice. The medical schools of Great Britain, being centred on hospitals, make little contact possible between the student and the patient's environment, even if they have an almoner's department. The "clinical case studies" of the more progressive American schools, which take the student to the social service worker, to the home or the works, and even force him to examine the public health organization of his area, do not seem to have been adopted by any school in this country. The young graduate goes out into the world largely ignorant of the effect of circumstances which are as likely to affect 75% of domiciliary patients as of those in hospital. It is not enough, however, that this should be put right. Medical practitioners cannot deal fully with such matters single-handed. For one thing, inquiries and guidance of the kind needed are too time-consuming. Further, although many patients or their friends will tell some things most readily to their doctors, others speak more freely to a sympathetic woman with a non-medical training. The association of workers of this kind with the field of domiciliary medicine is one of the components to be considered in the post-war reconstruction of medical practice which is in all our minds.

AMERICAN DOCTORS FOR BRITAIN

In a written Parliamentary reply to Sir Henry Morris-Jones, Mr. Ernest Brown, the Minister of Health, outlining the recommendations of the Robinson Committee, referred to the recruitment of medical practitioners from the U.S.A. as a new factor in regard to which action should be taken as quickly as possible. There is every indication that the response on the part of American doctors to the appeal for service in this country is warm and spontaneous. These men will come over full of enthusiasm, and may expect to be thrown into the front line of the medical effort almost immediately on arrival. There can be no doubt at all that the help of these American doctors is needed, even with careful reorganization of our own medical personnel on the lines of the recommendations made by the Robinson Committee. Their services will be used chiefly in the R.A.M.C. Some will find employment in the Indian Medical Service and Colonial Medical Services. It is, however, important that they should have a clear idea of conditions here, and of the inevitable waiting periods that must occur at those times when the activity of the enemy slackens both in this country and in the theatres of war over-seas. It is a fact that many officers in the R.A.M.C. find time hanging heavy on their hands. And it is also a fact that this cannot always be avoided, because they have to be kept ready for action and no one can foretell when the action will come. It is also possible that doctors straight from active practice in clinical medicine do not readily adapt themselves to the task of maintaining the fitness of bodies of men who are mostly free from ailments, and do not realize that this is a field which ought to occupy their time profitably. Nevertheless complaints have been heard from doctors in the Army that scope is not given them for the full employment of their professional skill, and that much of their time is taken up with routine administrative duties. This may in part be due to the inflexibility of the Army machine and its reluctance to adapt itself to the peculiar conditions of the present war, when the brunt of the attack is being borne by the civilian population. But the conditions of military medical practice differ from those of civilian practice, and the temporary R.A.M.C. officer has to adapt himself to "a style of life" that is determined by many factors outside his control.

Although it is understandable that the civilian doctor turned officer does not take readily to administrative duties, the regular R.A.M.C. officer realizes the necessity for retaining these under his own control if efficiency is to be maintained. The burden of the complaint, however, is not so much that office duties interfere with professional work, but that in the average general-duty appointment there is not enough work to go round. For our part we should understand that American doctors come from a country different in traditions and outlook, although sharing a common tongue and a common heritage, and we cannot expect them to take for granted the peculiarities of the British temperament and the occasional obtuseness of the official mind. It is important, therefore, that they should have every opportunity for professional service and that consideration be given to the kind of work they wish to do and where they are to do it. Special staff officers should be appointed to look after their interests and to satisfy themselves that the best possible use is being made of their skill and knowledge. This may be done by frequent visits to stations where they are serving and by friendly unofficial conversations. If, by reason of an incomplete understanding of the situation, they come to feel that they are not being fully employed, the repercussions on their friends and colleagues in the U.S.A. might not be altogether favourable to us. It is to be hoped, therefore, that the quick action to which the Minister refers would be to give these colleagues of ours the fullest opportunity for "quick action" in the actual medical and surgical work they desire to perform.

IMMUNIZATION AGAINST TUBERCULOSIS

A somewhat neglected field of preventive medicine in this country is protection against tuberculosis by active immunization. This can only be considered necessary for restricted classes of individuals, among whom children in tuberculous families are the most important, and medical students and nurses may also be included. It has been amply demonstrated experimentally that some degree of resistance to infection can be produced either with a simple vaccine composed of killed tubercle bacilli, or by inoculation with living but avirulent organisms. The B.C.G. strain, a bovine tubercle bacillus the virulence of which has been reduced almost to *nil* by prolonged artificial cultivation, has been extensively used in France for this purpose, although with results which it is almost impossible to assess. Apart from attenuation in culture, another cause of reduced virulence not only in tubercle bacilli but among micro-organisms generally is origin from or habituation to another animal species. Those who remember the "turtle bacillus" vaccine will know that this possibility has not been altogether unexplored in tuberculosis; the cold-blooded type of tubercle bacillus is probably too distant a relation of the human or bovine to produce the necessary response. Evidently in quite a different category is the vole acid-fast bacillus discovered by A. Q. Wells. The position of this organism, which is the cause of an epidemic disease among wild voles, was at first uncertain, but it is now regarded as a distinct type of tubercle bacillus. Only large doses of 5 mg. or more cause progressive disease in guinea-pigs, and it was thus naturally of interest to inquire what effect sublethal inoculation with the vole bacillus has on subsequent infection with human or bovine bacilli. The first results of experiments on these lines by A. Q. Wells and W. S. Brooke[1] are very striking. Guinea-pigs were given four weekly injections of living vole bacilli, making a total dose of 2 mg., and inoculated with virulent human or bovine tubercle bacilli five months later. Another group of animals was treated in the same way with B.C.G., the total dose being 30 mg. Unfortunately the scale of the experiment was reduced by intercurrent disease, and it had to be terminated abruptly at the outbreak of war, all the animals consequently being killed eleven weeks after the infecting dose. The findings at this stage are nevertheless remarkable. Unvaccinated controls had extensive generalized tuberculosis; animals immunized with B.C.G. also had generalized infection, although in a less advanced stage; but of fifteen guinea-pigs immunized with the vole bacillus, seven of which were inoculated with virulent bacilli of human type and eight with bovine, two showed no lesions at all, nine had only a small abscess at the site of inoculation, and the remaining four had in addition small visceral tubercles. The degree of resistance produced by living vole bacilli—at least as indicated by the course of infection during the first three months—is therefore much greater than that attainable with B.C.G. These observations have been extended by A. S. Griffith and T. Dalling.[2] Using somewhat larger immunizing doses of vole bacilli, and a much larger subsequent inoculum of virulent bovine bacilli, they found only local or early generalized infection in guinea-pigs killed after ninety-four days, by which time all unvaccinated controls had died of tuberculosis. In another series of guinea-pigs the total survival period was determined; all the vaccinated animals died of tuberculosis in periods varying from 109 to 225 days, with an average of 152; for controls the figures are 67 to 111, average 87. These authors have also made similar observations in calves, vaccinating them with the vole bacillus by either subcutaneous or intravenous injection, and later administering virulent bovine bacilli by the mouth. Whereas unvaccinated controls developed extensive glandular tuberculosis, the vaccinated animals were found to have either no lesions at all, or only a few scattered foci in mesenteric glands. All these results are highly encouraging, and if more extensive experiments confirm them field trials in cattle on a large scale will be amply justified. It is reasonable to hope that the vole bacillus may be equally non-pathogenic and yet an effective immunizing agent in the human subject, but no direct evidence of this is yet forthcoming.

[1] *Brit. J. exp. Path.*, 1940, 21, 104.
[2] *J. Hyg., Camb.*, 1940, 40, 673.

HYSTERICAL CONTRACTURE IN WAR

One outstanding medical achievement of the last war was Sir Arthur Hurst's discovery that the so-called "reflex paralysis," described by French neurologists as occurring in connexion with wounds without actual injury to the nerve, was not really reflex at all, but the result of hysterical perpetuation of a posture resulting from pain or spasm, or simply from splinting in a given position. The patient, so to say, does not realize when he has recovered, and maintains his posture and habit long after the need for it has departed. Sir Arthur Hurst showed not only that the limb can be restored to normal position and function by persuasion and explanation, but that the associated trophic changes can also be abolished by this means. It is important that at the present time this should be widely known, especially to surgeons and orthopaedists, so that reflex paralysis may not again appear in the catalogue of war disabilities. Observations on "reflex paralysis" show how it comes about that hysterical contractures of this type—that is, not primarily structural but volitional—can so often occur. Actually not volition but postural habit is involved, and no question of fatigue or of conscious co-operation need arise. This implies that the causes which Hurst described in the last war were psychologically of a simple kind and that the sufferers lacked positive motive for the continuance of their disability. If this were not so they would not have lost their disability so readily, or they would have replaced it by symptoms of another kind. The desire to escape from the Service or from some aspect of it could hardly have been present in individuals who were so readily cured without residual symptoms. It seems desirable to add this caveat so that doctors now treating such conditions may not be surprised if, while the war lasts, their efforts are less uniformly and immediately successful than those described in Hurst's classical paper.[1] The original work in fact, while recognizing psychological factors, ignored the possible existence of unconscious motives.

In a short restatement of his views recently published,[2] Sir Arthur Hurst gave some additional observations which are worth noting. The fact, for example, that the spasm of tetanus may be perpetuated hysterically is an exception to the rule that a hysterical paralysis is always such as can be imitated voluntarily with exactitude. Hysterical contractures described by him occurred frequently in normal men without any personal or family history of predisposition, whereas most war neuroses occurred in the martial misfits. Too little attention seems to have been paid in the last war to this matter of predisposition, which Hurst did not fail to note. Physiotherapists of all types would do well to notice his observation that they sometimes fail to enlist the active co-operation of the patient, who is too often allowed to lie back passively and

[1] *Brit. J. Surg.*, 1919, 6, 579.
[2] *Clin. J.*, 1941, 70, 29.

expect the apparatus or the masseur to do all the work. An interesting explanation is suggested for the alleged breaking down of adhesions in manipulated joints, whether these are disabled from functional or organic causes. What is heard may be the tearing of ligaments rendered brittle, so to speak, by circulatory stasis. If the stasis can be abolished first of all by encouraging the patient to move the joint, the sound of tearing is no longer heard.

ACUTE BILATERAL ADRENAL HAEMORRHAGE

A case of supposed malignant measles recently described in the *Journal* (March 8, p. 380) led a number of correspondents to point out that the facts were more consistent with a diagnosis of acute bilateral adrenal haemorrhage, the so-called Waterhouse-Friderichsen syndrome. This condition is probably more common in this country than is generally supposed. Some 70% of the published cases were associated with meningococcal infection, and during the present epidemic, or high endemic, meningococcal prevalence the proportion is likely to be nearer 100%. A recent comprehensive review by Lindsay *et al.*[1] adds four infections with meningococcus, two with *H. influenzae*, and one with *N. flavus* II to the ninety cases previously published. The haemorrhage in the adrenals was bilateral in 95% of the reported cases, but its degree varied from petechial haemorrhages to a large bleeding which converted the organ into a "blood cyst." In the milder degrees of haemorrhage the medulla was more involved than the cortex. All but one of the published cases were fatal and verified post mortem, but there seems to be no reason why some of the milder cases should not recover, as we can now combat the causal infection so much more effectively.

The syndrome has been chiefly found in infants and young children, 70% of the patients being under 2 years of age and only 10% being adults. The onset is that of a sudden fulminating infection. A previously healthy child vomits or wakes from sleep with a cry, is fretful, refuses food, and has a slight elevation of temperature and increased respiration rate. There may be some abdominal pain and diarrhoea, or even chills and convulsions. Physical signs at this stage are absent, but the child is obviously critically ill. In about half the cases cyanosis of lips and finger-nails occurs within a few hours of onset, and in all cases shock and collapse rapidly supervene. Within eight to twelve hours petechial and purpuric spots can be seen on the face, trunk, and limbs, and soon larger purpuric areas up to half an inch or more in diameter appear. Concurrently the patient generally lapses into stupor and coma. At this stage there may be slight neck rigidity, but more often there is muscular flaccidity. The spinal fluid is often clear, and the cell count averages 50 to 100 per c.mm. with a preponderance of polymorphs. The meningococcus or, rarely, other organisms (chiefly *Str. haemolyticus, H. influenzae, Staph. aureus*, or the pneumococcus) may be cultured from the spinal fluid or from the purpuric blotches. There is a polymorphonuclear leucocytosis. A low blood sugar is a valuable diagnostic sign when it occurs. The adrenal haemorrhage may happen at any stage after the appearance of the rash, generally within a few hours. The pulse then becomes weak, irregular, and of low tension, or it may be imperceptible. An attempt should be made to measure the blood pressure: complete absence of sounds strengthens the diagnosis. Too often there is little time to institute the therapy which is indicated. This consists of (1) intravenous sulphapyridine or sulphathiazole to combat the invading organism; (2) adrenal cortical extract or its equivalent in doses of 10 c.cm. or more twice daily—intravenously if possible—and perhaps adrenaline as well; (3) saline and glucose solution intravenously. Carey[2] reported a recovery in a female aged 27 years after treatment on these lines; until it has been tried out on many more cases it will be impossible to assess the value of adrenal and sodium therapy. G. E. Harris,[3] however, claimed three recoveries in meningococcal cases of the syndrome with imperceptible pulse on admission. Another recovery in an adult (unpublished) took place recently. In this case there was uncontrollable vomiting, muscular pains, a profuse generalized purpuric rash with some large patches, and a blood pressure that could not be recorded. All claims of recovery should be well documented in order that there may be no reasonable doubt of the diagnosis.

[1] *Amer. J. med. Sci.*, 1941, 201, 263.

ATRIAL SEPTAL DEFECT

In the past, patent foramen ovale, which has no effect on cardiac function, has been confused with atrial septal defect, a truly congenital and important cardiac lesion. Until a few years ago it was rarely diagnosed in life, yet, according to D. E. Bedford, C. Papp, and J. Parkinson,[4] it is the commonest of all such lesions. Their account, which is based upon fifty-three cases, including ten necropsies, shows that most of the cases occur in females, and that death from heart failure is not usual before early adult life or middle age. The heart may be quite large and yet symptoms remain slight for a considerable time. Clubbing of the fingers and cyanosis are usually absent until a late stage, and murmurs, if present, are due not to the defect itself but to associated changes in other parts of the heart and vessels. The apex beat is often forcible and displaced to the left, and is then produced by the hypertrophied right, and not the left, ventricle. In the absence of hypertension, or a history of it, or of aortic valve lesions, this type of apex beat is a small clinical clue to the diagnosis. Mitral stenosis was present in a high proportion of the cases in addition to atrial septal defect, an association which has been noted by others, and in these auricular fibrillation may occur. But this arrhythmia may develop in the older patients with atrial septal defect alone, in contrast to other forms of congenital heart disease, in which fibrillation is almost unknown. Radiological examination reveals the characteristic changes, and on this a correct diagnosis largely depends. It shows the main and branch pulmonary arteries to be considerably enlarged, and in the latter pulsation may be conspicuous in the hilar regions. The left lower cardiac contour is prominent and is formed by the right ventricle; the left auricle is not enlarged and the lung fields not congested. The changes in the electrocardiograph are of greater diagnostic value than in most other forms of congenital heart lesion, the chief being right axis deviation, partial or complete right branch block, abnormal P waves, and prolonged P-R interval. The differential diagnosis is from other causes of moderate or great enlargement of the pulmonary artery. The implication of this interesting account is that atrial septal defect should be recognized more often. No doubt it will be when it is more widely appreciated that, as in some other forms of heart disease, the *x*-ray appearances alone can establish the diagnosis.

[2] *Ann. int. Med.*, 1940, 13, 1740.
[3] *Proc. roy. Soc. Med.*, 1940, 33, 561.
[4] *Brit. Heart J.*, 1941, 3, 37.

We regret to announce the death of Dr. George Lovell Gulland, emeritus professor of medicine in the University of Edinburgh and consulting physician to the Edinburgh Royal Infirmary.

WHITHER WELFARE?

BY

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"Society must measure its well-being in terms of the health of its children."—McCOLLUM.

"Medicine, when confining itself to the study of disease, amputates a part of its own body."—CARREL.

"Paediatric practice offers the widest and most fundamental opportunities for the prevention of disease."—ROLLESTON.

Twenty years ago there were many subjects that seemed to be well established and well developed, including Christianity, the classical virtues, and medicine. Within the last few years, and more particularly within the last few months, they appear to have become younger, less mature, more urgent.

One of the most serious problems we have to face is that of economics. Will all medical and social services be drastically reduced? Can we any longer afford our plethora of general hospitals, small, voluntary, special, municipal hospitals, homes, sanatoria, school clinics, treatment centres, crèches, nurseries, chemists' shops, doctors, nurses, masseuses, bone-setters, faith healers, patent medicines, patent foods—in fact all the paraphernalia that purveys health, from the most devoted and sincere to the most commercial and quackish? Will the war result in a serious curtailment of all the amenities of life, all the advantages of our civilization? Or will it precipitate the formation of a health service that will gain in efficiency what it loses in complications, redundancy, wasteful expenditure of time, energy, emotion, and vested interests?

It is essential for us to part with all our preconceived ideas, however painful the operation may be, and, by employing all the perspicacity and all the common sense we can command, to classify desirabilities in their most intelligent order.

The Function of Medicine

Time was when to cherish the poor, to alleviate suffering, to feed the hungry, was looked upon as a means of salvation for the righteous rather than as an obligation of the citizen and a duty of the State. The modern State realizes that the health and well-being of its citizens, whether they be rich or poor, are an important asset. In former days legislation was only concerned in protecting the health, the happiness, and the property of those who were not fortunate enough to possess these things. It is now realized that it is equally important to supply those who have not.

Medicine started out as the study of human ills. Medicine men among some peoples will obligingly attempt to treat illness, direct emotions, and control the weather. It is unfortunate that for a time so-called scientific medicine has forgotten some of its concerns. It has almost ignored the things that could not be weighed, measured, or observed with an oil-immersion. It is only of recent years that such words as "environmental hygiene" have been invested with any seriousness. But disease means lack of ease. It does not imply bacterial, toxic, traumatic, mental, spiritual, nutritional, or domestic maladjustment. But it may mean any or all of these. The patient is not merely the embarrassing by-product of some pathological state. His self-respect and ambition must be fostered before he can even imagine his own possibilities.

To observe all the factors that affect human welfare needs good medical training as well as common sense. Sometimes it appears that medicine only begins where common sense ends.

On one occasion a doctor was summoned to the radiological department. The radiologist turned over pages of notes. "What do you want this barium meal for?" he asked. "Here is a poor old lady of 60. She has already had a blood count, a W.R., complete urine and faecal analysis, fractional test meal, etc. If you find an organic lesion she will only refuse operation, and, anyhow, she probably isn't fit for it. What good do you expect to do?" "Good?" replied the doctor. "Good? I don't expect to do any good. This is art for art's sake. If I ask for health visitors to follow up my cases, if I ask for opportunities to teach mothers how to look after their children, if I suggest that it might be easier for health visitors to prevent disease if they came here and learned something about the diseases they are trying to prevent, then I am told that I am interfering in matters that do not concern the hospital or myself. But I am required to spend a large portion of my time on work that is not in the least likely to do any good. Patients are asking for bread and we give them a barium enema. They used to call medicine the healing art. It seems to get more and more art and less and less healing."

The Present

We always seem to tackle human welfare from the wrong end. We set up medical schools and train doctors long before we have studied local conditions and local needs. We prefer to force diseases into categories rather than to study their aetiologies. In medical colleges much of the teaching is done by men who for years have had no contact with the conditions of living of the patients on whom they do the teaching. "Doctor," instead of meaning "teacher," generally means a bottle of medicine. When a medical student sees a child with dyspnoea he invariably suggests intranasal oxygen before he thinks of cleaning the nose.

Specialists have been so dazzled by advances in chemistry and mechanics, health officers have been so absorbed in bacteriology and in plumbing, that it has largely been left to the non-medical members of the population to realize the importance of domestic details in the cure and in the prevention of disease. Florence Nightingale was quite right. She sometimes deplored the discoveries of Pasteur and the development of bacteriology and immunology. They would, she said, absorb attention which should more profitably be spent on the benefits of good food, cleanliness, and fresh air.

Even the more modern developments of medicine—the health departments—have misconstrued the word "epidemiology." Many health officers have a sort of Black Death mind. To them the only sort of disease is a notifiable disease. If a town is free from plague, cholera, and small-pox they call it "healthy" or "remarkably healthy," although the infant mortality stands at 150. When the major epidemics have been reduced and a couple of decades have been spent in self-congratulation, the health officer then turns his attention to tuberculosis, venereal disease, and maternity and child welfare. His clinical work has never included much of these subjects. What it did he has forgotten. But he is undismayed. He and his staff set out to prevent disease. Then one sees the woman with a nutritional dermatitis being treated as a syphilitic and the child with beriberi being treated for tuberculosis, all because we insist on thinking in terms of specialisms and of diseases rather than in terms of patients.

"Tropical Medicine" is a label that has misled a great deal of observation and of thought. If we had given more time and attention to the oecology of disease instead of to its biochemistry, to its external implications instead of to its internal, we should have learned a great deal more about it.

Great discoveries are made and heralded with applause, but how many of these discoveries are implemented so as to contribute to human welfare? Everywhere the feeling is growing that the amount of time, money, and energy spent on research work is disproportionately great compared with that spent in making discoveries available *and acceptable* to masses of dirty, diseased, ill-fed, and unhappy people. Why are lunacy and carcinoma of the cervix both exceedingly rare in the West African female? Why is mental hygiene almost ignored? Why are white bread and polished rice still eaten in large quantities? Why the profound sartorial gulf between the honorary staff and the M.O.H.?

Why do we find glossy overweight scientific periodicals in many languages on such subjects as leprosy, syphilis, and balneology? There are world conferences on these subjects, patronized by dignified delegates and internationally financed. Why are the journals that refer to health education, welfare, and the social-economic aspects of medicine relatively few, unassuming, and amateurish? Why is it that these subjects are so seldom celebrated by meetings and by discussions? We take our own standards of life so much for granted that we simply have no conception that they are not universal. Sometimes our patients give up talking to us because they know that we will never understand. We allow children's hospitals to exclude women from their staffs, although these hospitals are largely supported by public funds, and although the women who conduct the welfare clinics are the doctors who above all would profit by the paediatric experience.

All over the world one sees those dreadful anomalies: the sanitary inspector's child with profound helminthiasis, the doctor's child with severe malnutrition, and the school teacher's child whose regime alternates between that dictated by the local witchcraft and that proclaimed by the more flamboyant advertisements for patent foods and patent medicines.

The Project

The crying necessity to-day is for the application of some of the most obvious and most desirable improvements. Up to now the acknowledged leaders of medicine have been mostly super-chemists, super-carpenters, and super-sanitary inspectors. Medical, social, and economic welfare can no longer afford to be directed by the whims of the influential ignoramus.

There is a certain town where the welfare centres are conducted on scientific lines by a well-trained medical staff. Patients are weighed and measured at each attendance. Dick, Schick, Wassermann, and Mantoux each receive obeisance. Charts and records are admirably kept. But the infant mortality has remained completely unaffected. The doctors say to each other, "This is interesting work, but it does no good." In another town a few miles away the welfare centres are run entirely by nurses. Here they teach the mothers what to eat and what to give the children to eat. They go to the houses and see exactly what is boiling in the pot. They make a fetish of breast-feeding. They teach the mothers how and why the babies should be washed and clothed and aired. The infant mortality has been reduced in such a dramatic manner that two doctors were spending most of their time in trying to explain it away.

The pioneer paediatricians had one quality in common. They regarded the parents, and the mother in particular, as the prime enemies of the child. In these more enlightened and infinitely more complicated days it is beginning to be realized that to take a child into hospital and cure his disease only to send him back to precisely those conditions which produced the disease is a form of hypocrisy as well as being no sort of economy. It is also realized that the love of children is not a sentimental virtue. It is a natural function. It can be relied upon, and with foresight and intelligence and perseverance it can be educated into the most powerful disease-preventing factor on the face of the earth, and it is one that can be found all over the earth.

Those responsible for public health programmes are bound in loyalty to their public to examine work that has been done in other countries and to sift out methods that are applicable. But many health officers, together with certain politicians of the nationalist-racial-prejudice variety, often claim the right to "make their own mistakes," "to get along somehow by a process of trial and error" at whatever cost to the unfortunate, the impoverished, and the inarticulate. It would be salutary discipline for politicians and public health authorities if they, like clinicians, had to sign the death certificates of all their failures. It is therefore essential for those who direct medical policy to study not only the oecology of disease but also the varieties of approach, of administration, and of treatment that are attempted in various countries, and to cultivate the habit of appraising them.

Nationalism and racial torts have done so much damage to the amiabilities of civilization and to the advance of social improvements that we must do what we can to extract some advantages from them. Their methods of education and of propaganda are among the most successful that are known. They include education and discipline of the very young, keeping people busy, giving them responsibility, making them feel that they are indispensable to their ideal: these are the main approaches. Through the amalgamation of welfare, education, agricultural, administrative, and health services these methods might be employed to build up an ideal State.

All over the world the problem is the same—to increase social service of every variety within the economic possibilities of the population. Some countries (such as Yugoslavia, for example) have been doing this with marked success. British tradition in nursing and medicine is old and well established, and accordingly slow in adapting itself to new-found needs and new-found objectives.

A Neglected Branch of Medicine

Welfare work is the youngest, most unassuming, most neglected branch of medicine. Instead of being the foundation of all good medicine it is regarded as a merely tolerated excrescence. Even its stoutest supporters make nothing but tentative and apologetic claims for it. Though there is work crying out to be done, it is always being warned that it must not "usurp" this and that. It has suffered from all manner of handicaps. It has often been conducted by inexperienced and undistinguished doctors. "Sanitary-engineers" are supposed to have some specialized knowledge of sanitation, but child-welfare doctors are seldom required to have any specialized knowledge of paediatrics. It has only rarely been associated with any sort of research, and in consequence has often lacked vitality and pursued antiquated or unsuitable methods. Welfare centres are established in various countries on conventional lines long before local conditions have been studied and local needs understood. And the creature that in all the world is most at the mercy of his environment is the human child.

Welfare work has often been regarded with jealous disfavour by general practitioners, scoffed at by hospital staffs, dominated by ignorant lay committees. It is often directed by health officers who, in the absence of any clinical or practical experience, are prepared to dictate policy, very often to the serious detriment of the work.

Because of the lack of skilled direction welfare work is often pursued half-heartedly. Even in a country which is a by-word of advancement in these matters one finds the most strange situations.

The public health nurse was visiting the house of a labourer getting the equivalent of £4 a week and presenting the mother with clothes for the expected infant. Two older children appeared, suffering from dirt and dermatitis. They were treated with ointments. It was discovered that the family kept a car. A visitor expressed surprise at the necessity for giving away clothes to people who were obviously well off and at the absence of comment on the obvious dirt and disorder. The public health nurse explained that she could not comment on the dirt or the people might be offended; they were too poor to buy infant clothes, because they had to keep a car in order to go to the races.

In spite of the fact that welfare work is often cramped for funds, for staff, for space, and for honest objective, it is undoubtedly the method by which improvement can in future most economically be made. To anyone who has had first-hand experience of welfare work, in its wider sense, when conducted in close co-operation with paediatrics, obstetrics, and other social services, it is obvious beyond all doubt that the extension and development of this work are the most effective and most economical means by which the greatly-to-be-desired improvement in health and in living can be realized.

Planned Economy and Personnel

It is more profitable to spend money on 100 semi-healthy children so that they may become 100 healthy citizens rather than on ten middle-aged invalids so that they may become ten old semi-invalids. And, incidentally, it is much cheaper. It is essential in the first place to give reorientation to medical education that will fit the doctors for a more constructive function. Paediatrics, especially preventive paediatrics, calls for more research and for far more application. In the second place the training of nurses will have to be revised to make them fit for work that is preventive as well as curative. Medicine must realize its social as well as its somatic obligations. The work of the almoner and of the social worker must be incorporated in the essential work of the medical personnel.

The kind of rigidity and automatism that obtains in some nurses' training is entirely out of place in welfare work. A training lasting not more than three years should be developed that will include preventive, curative, social, educational, environmental, nutritional, mental, domestic, and even agricultural, economic, and industrial considerations, especially with regard to children. Courses of training in Canada and Yugoslavia, methods of conducting health work from Kentucky to Batavia, should be considered in evolving new developments. Preventive and curative work are so intimately connected in their application to individuals (as contrasted with their application to communities and to things) that effective medical services will not be attained until their present unhappy separation has been healed.

Sound welfare work can only be accomplished on a good basis of paediatrics and obstetrics, with the emphasis on the paediatrics. In countries that are impoverished and backward it is the extension of welfare work that offers the best hope of improved standards of living. Welfare cannot be developed satisfactorily until it forms the basis of a wide and well-planned State organization. It is high time for some fairy godmother to put in an appearance and place this most deserving of all Cinderellas in her proper sphere.

I have to thank the Honorary Director of Medical Services, Straits Settlements, for permission to publish.

GLYCERIN AND IODINE IN TREATMENT OF WOUNDS

In response to inquiries that have come from readers of his paper on the reception and treatment of air-raid casualties (April 19, p. 584) Mr. John Robert Lee sends the following fuller note on the use of glycerin and iodine.

The formula of the glycerin and iodine solution is:

℞ Iodine .. .. grains 200
Potassium iodide .. .. .. ʒj and grains 160
Distilled water .. .. .. ʒj
Glycerin .. .. .. to ʒxx

Make a solution. To be used as directed.

Dispensing Note.—Grind the potassium iodide to a fine powder in a mortar, add the iodine, mix well with a glass rod, add the water, which just makes a solution, then add the glycerin.

Technique.—This solution may be used in full strength or in half strength, being diluted with glycerin. Use the solution *—full strength—to paint on abrasions, or to pour into wounds* if need be while resuscitation is being undertaken; also in the theatre to swab out or to "curette" with gauze soaked in the solution such wounds as cannot be excised. So far as possible bandages are not used, the wounds being painted and covered with a sterile towel. At the first dressing in the ward, in cases in which dressings have been used, syringe hydrogen peroxide on to the edges of any adherent gauze or wool to facilitate removal; then use half-strength solution, because in some cases the full strength causes some smarting pain. Pour on the solution or paint the parts lightly; do not rub. Dilute to half strength by using equal parts of the solution and *glycerin; never use water:* water will cause burning and blistering. The solution, strong or dilute, will not burn or blister.

CENTRAL MEDICAL SCHOOL, FIJI

Steady progress in the fight against disease is being achieved among the Western Pacific Islands by native medical practitioners trained at the Central Medical School, Suva, Fiji, of which Dr. D. W. Hoodless is the principal. It is hoped that this school may eventually become the recognized medical training centre for the entire Pacific Islands area.

Founded by the Government of Fiji as an integral part of the Native Medical Practitioner Service, the Suva Medical School became the Central Medical School in 1928; when it was enlarged and extended. This was made possible by assistance from the Government of Fiji and the International Health Division of the Rockefeller Foundation. Students come to the school from the Colony of Fiji, Western Samoa, the British Solomon Islands Protectorate, the Gilbert and Ellice Islands, Nauru, the Kingdom of Tonga, the Cook Islands, the Rotuma Dependency, the Anglo-French Condominium of the New Hebrides, and American Samoa. It is hoped to bring Pitcairn Island within the scope of the school's activities. The course of training extends over four years, the first six months of which are taken up with pre-medical studies. Graduates receive a diploma which entitles them to practise medicine and surgery in any of the territories sending students. The diploma is not recognized for practice outside these territories, and is designed especially for their needs. One declared principle of the school is to preserve the native character of its graduates in order that they may more readily be accepted in the native social system, and thus spread their acquired knowledge. There is a students' hostel and accommodation for forty undergraduates, with sports amenities and a students' council. All students live in the hostel. Postgraduate courses are also held at the school.

The Governor of Fiji and High Commissioner of the Western Pacific, Sir Harry Luke, has said of the school: "It is one of the most beneficent gifts which British rule has conferred on the native races of the Pacific." Graduation ceremonies—the proudest occasion in the life of successful students—are held in the Legislative Council Chamber at Suva, and diplomas are presented by the Governor.

THE GENERAL PRACTITIONER AND SCIENTIFIC THOUGHT

The general practitioner is often praised, disparaged scarcely less often, and occasionally understood. A careful and sympathetic analysis of his difficulties was given in a paper read last week before the Royal Society of Arts by Dr. O. R. TISDALL. But the lecturer appeared to foresee the coming of State medicine in which the private general practitioner would disappear and doctors become servants of the State, responsible to it instead of to their patients. His disappearance, he said, would be a loss to the community, not because he is necessarily more efficient or capable than the State official who would replace him, but because of his irreplaceable position as confidant and friend of his patient. On the other hand, with the coming of State medicine Dr. Tisdall thought that the more scientific treatment of the patient was likely, it would be easier to have laboratory tests done at nominal cost, easier to refer the patient for examination, and easier for the doctor to keep abreast of new work by attending refresher courses. While the period of transition from private to public practice would be difficult, it had been already prepared for by the invasive activities of public services and clinics.

New Experiences and New Remedies

Dr. Tisdall pictured the newly fledged practitioner, starting with high hopes, full of painfully acquired knowledge, "and usually with a good conceit of himself," and finding in contact with the actual experience of practice many of his preconceived ideas swept away and his work subjected to limitations outside his control. He was wise if, notwithstanding a certain disillusionment, he still felt he could perform useful service to the community without seeking refuge in specialized or institutional work. The problem would be to keep himself up to date in a science and art in which new facts and an even greater number of new theories were constantly being thrust forward. The practitioner could, of course, study the medical journals, attend meetings of professional societies, and enter for intensive postgraduate courses. Most men who took their profession seriously did their best to familiarize themselves with scientific advances. But what constituted a real advance? Dr. Tisdall mentioned three major advances within his own experience of practice: the discoveries of insulin, liver therapy, and the sulphonamide group of drugs. The last-named discovery in particular brought up one aspect of the problem which constantly faced the practitioner—namely, the publicity given to medical innovations in the lay press. The patient saw the announcement of some sensational "cure" in a case which he thought similar to his own, and demanded that it be tried on himself. The practitioner could not try every new remedy, but he dare not neglect them all, and in respect of those he did try he came up against the constant dilemma of clinical treatment—*Post hoc, ergo propter hoc?* If a practitioner treats a case with an injection strongly recommended by authority and the patient is well next day, is it due to the injection or to the recuperative power of the patient? Nature is not always the most conformable of colleagues, and often she pushes in and effects a cure on her own with scant regard for the doctor struggling in her wake.

The Critical Faculty

It is not always realized that the general practitioner is very differently circumstanced from the hospital clinician, who can try out a new remedy extensively and have controls. How dare the general practitioner in the little community of his practice have controls! If one patient makes a spectacular recovery after treatment with a new drug another will want to know why it was denied him; and if, on the other hand, the drug is unsuccessful the patient will protest against being the subject of experiment. The solution can only lie, Dr. Tisdall said, in preserving a sense of proportion. The practitioner should be prepared to give a reasonable trial to any new development which has been accredited by those in whom he has confidence, but still he should preserve his critical faculty and decide for himself whether his patient has benefited or is likely to benefit.

In spite of the handicaps of general practice, the practitioner should not belittle his opportunities of developing his scientific knowledge. After all, he has unusual opportunities for making observations, and, while he can enlist the aid of laboratory tests, it is still for him to draw his own conclusions. Dr. Tisdall thought there was a regrettable tendency to regard the laboratory as the final court of appeal. Students seemed to think it was better to examine the patient's chest by *x* rays than to examine it clinically. Everyone admits that the accurate reports now possible from the laboratory and the *x*-ray room are of great value in diagnosis, and without them much limitation would be placed upon clinical work; but it is mere juggling with words to say that the one is scientific medicine and the other is plain medicine. It is for the clinician to weigh the evidence of the laboratory, balance it with the evidence of his own senses, and deliver the verdict.

Growing Edge and Individual Touch

Lord DAWSON OF PENN, who presided at Dr. Tisdall's lecture, spoke of the "growing edge" of the knowledge of medicine. In any branch of knowledge with a growing edge differences of opinion must be expected among those who followed and applied it (Dr. Tisdall had mentioned the dissension, sometimes slightly acrimonious, in the correspondence columns of the medical journals). But there was no profession in which there was less difference of opinion as to the basic facts. In the application of new knowledge, said Lord Dawson, the practitioner should have an open, progressive mind, but not a mind immediately influenced by the opinions of the market place. While medicine comprehended an increasing number of sciences and the range of knowledge which it demanded seemed ever to extend, the make-up of the individual patient remained much the same. In days gone by when violent epidemics laid whole communities low, mankind seemed to be reduced to a common denominator and the individual to be more or less effaced. This was so in the days of the great plagues and, to quote a modern instance, in some measure in the influenza epidemic at the end of the last war. But, in the main, infectious diseases were becoming less severe, and the less severe the disease the more did the individuality of the patient count. Lord Dawson believed that individual illness, and with it the art of treatment, would necessarily become more complex, requiring more training of the doctor in the interpretation of the patient. It was here that the value of the general practitioner came in, with his insight into the mind and feeling and circumstance of the people whom he attended. A State service would reduce the relationship to an official one in which the individual touch, the understanding sympathy, which was one of the great features of the best type of medical practice, would be lessened. But while individualism should be preserved there was need, Lord Dawson insisted, for more planning in objective observation and investigation. The real problem as he saw it was the combination of those two things: the ordered investigation of illness, probably in buildings set apart for the purpose, and individuality in the human contact.

DIAGNOSIS AND TREATMENT OF GAS CASUALTIES

The following memorandum on the diagnosis and treatment of gas casualties has been prepared for the Ministry of Health for the information of medical practitioners.

Of the poison gases likely to be used by the enemy there are two main types: (1) the vesicants (mustard group) and (2) the pulmonary irritants (phosgene group). A knowledge of the main clinical features of gas poisoning and of the essentials of treatment should be possessed by every medical man and woman in the country.*

I. Vesicants

Of these mustard gas is considered the most important. It accounted for upwards of 70% of all our gas casualties in the last war. It can be employed in shells and bombs and sprayed from aeroplanes. Its dangers should not, however, be overemphasized. Its mortality in the British Army in the last war was little more than 2%, and 80% of cases were fit for active duty within a month. *To secure such low figures a high degree of gas-mask and other discipline is clearly necessary.*

The early symptoms (which develop in the course of a few hours) include skin burns varying from a slight erythema to severe blistering and affecting the softer skin and moist surfaces especially; blepharitis and conjunctivitis; laryngitis, tracheitis, and bronchitis; vomiting. The sequelae in the graver cases include corneal ulceration, bronchopneumonia, and bronchiectasis.

The lesions may be caused by vapour or by actual droplets. The latter should be immediately removed from exposed skin by dabbing (not wiping) with handkerchief or linen, which should at once be discarded. When possible bleach ointment or paste or Anti-gas Ointment No. 2 should then be applied to the skin. The next indication is the earliest possible removal of contaminated clothes and footwear and free washing with soap and water. Treatment of the eyes, if affected, should always be given preference over treatment of the skin. It should include immediate and free irrigation with water. To prevent secondary conjunctival infection the instillation of albucid in a 2.5% solution four times daily is recommended. Later atropine 1% in ointment or in drops may be used to counteract the pain of ciliary spasm. Liquid paraffin drops to prevent sticking of the lids may be employed after twelve hours. Cocaine preparations and bandaging of the eyes must on no account be allowed. Eye-shades may be used in the early stages. Blisters should be aspirated with a hypodermic needle and syringe. For open skin lesions, after the stage of profuse exudation, the recognized surgical treatments for ordinary burns should be employed. Laryngitis and tracheitis should be treated with steam inhalations. Bronchitis and bronchopneumonia should be treated on general principles; it is possible that sulphapyridine may prove valuable in preventing the latter.

In the last war there was a high incidence of functional sequelae, including photophobia and blepharospasm, aphonia, and vomiting. Early reassurance as to the unlikelihood of blindness, discountenancing a too prolonged use of eye-shades, etc., may play an important part in treatment. *Once the early essential treatment has been given mustard gas casualties may be safely evacuated to a distance as stretcher or sitting cases according to their severity.* In the case of patients severely injured as well as contaminated with gas, elaborate washing, etc., will clearly be out of the question, but the clothes should be cut off as quickly as possible and local eye and skin contamination dealt with as effectively as the condition of the patient may allow. The order of urgency in such cases is: (i) removal of outer garments and shoes; (ii) methods directed towards saving life and treating shock; (iii) saving the eyes; (iv) cleansing the skin.

Another vesicant gas is lewisite. It is also a lung irritant, a nose irritant, and a tear gas. It is the more readily recognized on account of its early effects on the upper respiratory tract. When present in large quantity on the skin it can be absorbed and cause severe general and visceral symptoms of arsenical poisoning. For removal from the skin hydrogen peroxide (20 vols.) or a 20% solution of hyperol (urea peroxide) is a most effective counter-agent. If blisters occur they should be opened and the raw surface irrigated to lessen the likelihood of absorption. Otherwise the treatment is as for mustard gas.

II. Lung Irritants

Of these phosgene is the most important. It can be employed in shells or bombs. When the gas is present in very high concentration early death from asphyxia may occur in the case of inadequately protected persons. With the more usual concentrations immediate symptoms may be slight or absent, but dangerous symptoms may follow up to several hours after exposure. The likelihood of such symptoms developing is much increased if the exposed subject remains physically active. Every person, therefore, who has been exposed to phosgene vapour without gas-mask protection should become a stretcher case as soon as possible.

On arriving in hospital or at a treatment centre cases should be grouped into mild, moderate, and severe categories and, if possible, treated separately. The "mild" cases show a reddish flush on the face, increased respiration rate, and pain in the chest aggravated by coughing. Absolute rest, fresh air, fluids, and nursing are the chief indications, together with careful watching lest any of them pass into one of the graver groups. The "moderate" cases show greater respiratory distress, with varying degrees of pulmonary oedema, "blue" cyanosis, distended neck veins, a full strong pulse without great increase in rate. The indications are continuous oxygen by nasal catheter or B.L.B. mask (or in the less severe cases intermittent pure oxygen from a nitrous oxide bag), venesection, and nursing care.

The "severe" cases show collapse, coldness, a weak rapid pulse, and pallor with leaden "grey" cyanosis and no distension of the neck veins. There is profuse pulmonary oedema, often with froth pouring from the mouth and nose, and great respiratory distress with shallow and largely diaphragmatic breathing and the chest in the inspiratory position. The indications are continuous oxygen in high concentration with the B.L.B. mask or double nasal catheter, the flowmeter delivering at a sufficient rate to maintain a pink colour in cheeks and lips. Venesection should not be attempted. It may be necessary to lower the head and raise the feet to allow the oedema fluid to escape more freely. Morphine is contra-indicated. Atropine and adrenaline are not indicated. Although there are haemoconcentration and increased viscidity of the blood the use of all forms of intravenous fluid is at present considered inadvisable owing to the risk of increasing the pulmonary oedema. Warmth and the most attentive nursing are essential. Patients may be restored to health after as much as seventy-two hours of continuous oxygen administration. Pneumonia is an occasional complication. Late sequelae are rare. *It cannot be too much emphasized that oxygen properly administered is a life-saving therapeutic agent both in the "blue" and "grey" cases. Evacuation of phosgene cases to a distance until they have been pronounced out of danger should be prohibited. Even the slightest cases should be under observation and at rest for forty-eight hours.*

III. Carbon Monoxide

Poisoning by CO may result from leakage from gas mains after air raids or from the explosion of bombs in a confined space. Rest, restorative treatment, artificial respiration, and oxygen with carbon dioxide are the chief indications.

IV. Tear Gases and Nose Irritants

These do not produce casualties requiring hospital treatment. The main symptoms are lacrimation, sneezing, intense frontal headache, burning mouth and throat, nausea, and tightness in the chest. In a gas-free atmosphere the symptoms usually pass off in an hour.

Important Notice

The gas-mask, if properly adjusted and in time, gives full protection to the lungs and eyes against all these gases. In the event of gas attack the medical profession would have a most important part to play, not only in the recognition and

*A reprint of the 1940 edition of the War Office Medical Manual of Chemical Warfare (published by H.M. Stationery Office, price 2s. 6d.) is now in preparation. This 1941 edition will embody amendments covering recent recommendations for treatment.

the treatment of cases and the recording of any new phenomena, but also in the prevention of panic by constant reassurance, by insistence on gas-mask discipline, and by stressing the effectiveness of the protective and therapeutic measures at our disposal.

BRITISH PHARMACOPOEIA: NOMENCLATURE

The General Medical Council has approved names for certain substances which are now being produced, or are likely shortly to be produced, by British manufacturers, in some instances under licences granted by the Comptroller-General of Patents, Designs, and Trade Marks. These substances have hitherto been known under other names, which are given below together with the names now approved. The question of including these substances in the *British Pharmacopoeia* is under consideration, and if any of them is included the intention is that the approved name given below will be its official title.

Approved Name	Other Names
Diodone	Perabrodil
Diphenan	Butolan
Dithranol	*Cignolin*
Hexazole	Triazole (Azoman)
Mesulphen	Mitigal
Pholedrine	Veritol

The British Pharmacopoeia Commission hopes that the early publication of these approved names may lead to their general adoption.

Reports of Societies

CHEMOTHERAPY, SEROTHERAPY, AND HAEMOTHERAPY IN OTO-LARYNGOLOGY

At a combined meeting of the Sections of Otology and Laryngology of the Royal Society of Medicine on May 2, Mr. LIONEL COLLEDGE presiding, the subject of discussion was chemotherapy, serotherapy, and haemotherapy in diseases of the ear, nose, and throat.

Uses of Sulphonamides

Colonel L. E. H. WHITBY said that the principles for the use of sulphonamide drugs in this field were the same as in any other region of the body—namely, the infecting organism must be sensitive, the concentration of drug must reach an effective level and be maintained there, and the position in which action was required must be favourable. In acute otitis media statistical results and individual studies showed that the incidence of grave complications was reduced by chemotherapy, though factors other than chemotherapy, such as the prevalence of epidemic influenza, also affected the incidence of complications. Each case called for individual consideration as to whether surgery or chemotherapy, or both, should be employed. Pus always required drainage; bony involvement responded badly to chemotherapy. General well-being was a better guide to progress than the temperature chart. Sulphonamide drugs must be given boldly and in full dose. Inadequate dosage masked symptoms and failed to eradicate infection. Chronic aural suppuration responded less well, probably because of bony involvement. Nevertheless, secondary infection with *B. proteus* or *B. coli* could sometimes be controlled. The treatment of nasal sinusitis was generally disappointing unless begun in the stage of hyperaemia before pus formation was definite or bone was involved. Streptococcal tonsillitis and adenitis responded well, though statistical assessment was difficult. Complications in scarlet fever appeared to be reduced by a combination of chemotherapy and serotherapy.

Indications for Haemotherapy

Dr. H. F. BREWER said that the success of chemotherapy had greatly diminished the use of specific therapeutic sera. But chemotherapeutic action was directed against bacteria, and none of the new compounds affected toxins directly. In the field under discussion specific antitoxic serum was still the primary and essential treatment for active infection with the diphtheria bacillus (unresponsive to present chemotherapeutic agents), and as an adjuvant to chemotherapy specific serotherapy might be beneficial in acute infections (especially with complications and metastatic spread) by the pneumococcus, staphylococcus, and *Str. pyogenes*. The indications for haemotherapy were relatively infrequent and non-specific. As a pre- or post-operative measure to combat simple anaemia, stored blood up to fifteen days old compared favourably with fresh blood, and the reaction incidence was not significantly increased. Concentrated red cells afforded a means of raising haemoglobin percentage without unduly influencing blood volume. For anaemia associated with or dependent on sepsis or for a blood disease—for example, haemophilia or thrombocytopenia—fresh blood was to be preferred.

Chemotherapy and Ultra-short-wave Radiation

Mr. J. ANGELL JAMES said that in 1935 he began to use ultra-short-wave radiation in acute otitis media and acute sinusitis. During the period 1938 to 1940 both sulphonamides and ultra-short-wave radiation were used together whenever possible, and he had not attempted to assess accurately the relative influence of the two in the final result. In a series of 750 cases of acute suppurative otitis media seen during the three years before and three years after the introduction of the sulphonamides and ultra-short-wave radiation, of the cases which received early treatment 9% required a mastoid operation in the pre-sulphonamide group and 1.7 in the post-sulphonamide group. The corresponding figures for a group of 210 cases of acute sinusitis were 25% requiring operation in the earlier group and 7% in the group following the introduction of sulphonamides.

Mr. NORMAN JORY said that bleeding was so readily controlled that blood transfusions in otology were almost never required. Before the introduction of sulphonamides serum therapy appeared to offer the best help in the very ill case. It was natural to turn to an appropriate antiserum for help, and in some cases this appeared to give good and even dramatic results. The difficulty was to provide the specific antiserum, and the administration was not entirely without discomfort and risk. There was a growing tendency to begin treatment with sulphonamides earlier in the course of an infection. He drew attention to some of the untoward effects following their use. The evolution of less toxic compounds was likely in the future; meanwhile, he felt it undesirable to use sulphonamides in every case. They should rather be held in reserve to be used as necessity dictated.

General Discussion

Mr. T. B. LAYTON said that in thrombosed sinuses sulphonamides were likely to cause difficulty in diagnosis by masking the symptoms without touching the disease. If there was no organism in the clot, the clot was a physiological reaction and best left alone; if there was an organism there would be no symptoms arising from it until the breaking down of the clot allowed organisms to pass into the blood stream. If chemotherapeutic drugs were given in that type of case they would mask the only symptom which enabled one to decide on operation.

Mr. F. W. WATKYN-THOMAS also said that with chemotherapy there was a danger of masking the symptoms, especially in septic lateral sinus phlebitis. The sulphonamides might be administered in the very earliest stages of acute otitis media, but once it had become necessary to carry out a paracentesis the administration should stop, because if there was going to be any further spread it would be in the bone and in the very position in which sulphonamides could not reach it. The same thing applied even more strongly in any question of intracranial complication.

Mr. TERENCE CAWTHORNE said that he had looked up the recent literature and found records of 194 cases of septic meningitis which had recovered presumably as a result of chemotherapy. Since the introduction of chemotherapy he himself had had nine recoveries out of fifteen cases. In osteomyelitis of the frontal bone following frontal sinus infection he had treated three cases, not doing any extensive operation

at all, and all had recovered with simple drainage of the abscess. In two of the cases he removed some tiny flakes of bone three or four months later. Before chemotherapy extensive operations would have been done, in his experience disappointing and mutilating.

Mr. F. C. W. CAPPS referred to the dangers of chemotherapy when used without adequate clinical observation. He had tried to impress on practitioners that the subsidence of symptoms was not sufficient, and that until the drum-head was seen to return to its clinical normal the case must not be regarded as cured. If the drum was still bulging and reddened, even though symptoms had subsided, there was need for resort to paracentesis.

Mr. R. G. MACBETH asked if the sulphonamides were of any prophylactic use in tonsil excision and laryngeal operations.

Colonel WHITBY, on this last question, considered that a reasonable prophylactic course occupying two or three days was justifiable. The risk was very small, and the course could always be expanded to full treatment if required. If he had any reason to anticipate septicaemia he would employ these drugs prophylactically. As to the danger of prolonged courses of minimal doses, there were certain people who were sensitive to these drugs and unable to tolerate more than a gramme or two without exhibiting skin rashes or granulocytopenia or even agranulocytosis. Ordinarily the course was of seven to ten days and the total amount between 50 and 60 grammes. Intolerance was a question not so much of the amount as of the time. People became sensitized when even minimal amounts were given for prolonged periods. With a course of 50 grammes occuying ten days there was less likely to be trouble than with the same total amount spread over a month. As to antibody production in patients treated with chemotherapeutic drugs, there appeared from experiments on mice to be a certain, though not very durable, resistance to pneumococcal infection but not to streptococcal. There was something to be said for active immunization with vaccines, though against the streptococcus this was extremely transient.

The annual meeting of the Cardiac Society of Great Britain and Ireland was held at Oxford on April 18 under the chairmanship of Dr. A. G. Gibson. Dr. J. B. Herrick (Chicago) and Dr. Frank N. Wilson (Ann Arbor) were elected honorary members, in addition to Dr. Paul White (Boston), elected in 1938. Accommodation was kindly provided at Merton College, where books and records of William Harvey were on view. At the morning session there was a debate on the early signs of cardiovascular disease. In the afternoon the treatment of coronary thrombosis was discussed. Original communications, as arranged by the honorary secretary, Dr. Maurice Campbell, included papers on the right pectoral electrocardiogram in auricular fibrillation, the collateral circulation in coarctation of the aorta, the haemic factor in angina pectoris, the electrocardiogram of the Stokes-Adams attack, and a criticism of the term "chronic myocarditis."

The Ministry of Food announces that while the sale of milk to consumers is reduced to six-sevenths of the quantity sold during the first week in March, members of the National Milk Scheme, children receiving milk in schools, and inmates of hospitals, maternity homes, and nursing homes will continue to receive their full requirements. In addition, on the advice of the Special Diets Committee of the Medical Research Council, persons suffering from active tuberculosis, silicosis, affections of the mouth, throat, or gullet which prevent swallowing, gastric, duodenal, or anastomotic ulcer, illnesses characterized by high fever, and post-operative conditions may obtain a daily supply of milk up to a maximum of two pints on production of a medical certificate. This certificate is to be given on a form obtainable from the local Food Offices of the Ministry, which will ordinarily be supplied only on the request of a medical man. Criticisms of the procedure have appeared in our *Supplement*, and the British Medical Association is making representations to the Ministry of Food.

Local News

INDIA

Health of the Army in India

The annual report for 1939 on the health of the Army in India gives a satisfactory account of the British and Indian troops during the year which saw the outbreak of war in Europe. There were no serious epidemics, although civilian areas amidst which troops were placed suffered extensively from cholera, plague, small-pox, dysentery, malaria, and enteric fevers. Among British troops the hospital admission rate of 666 per 1,000 of strength during the year seems very large, and, indeed, it was an increase on the rate for the year before, but the death rate of 2.75 per 1,000 and the invaliding rate of 9.14 per 1,000 were lower, and all these rates during the last quinquennial period continue to show the fall which has been progressive since the last war. Among the Indian troops, though the death rate was down, the hospital admission and the invaliding rates were up, but it is stated that the increases can be fully accounted for by the conditions of war service, and the return or influx of large numbers of men potentially infected with malaria and other prevalent diseases. Malaria and dysentery—the percentage figures are exactly equal—share the top place in the list of principal causes of sickness among officers of the British Army in India, and these are followed by catarrhal jaundice and cellulitis. Among the soldiers malaria has first place, followed by cellulitis, and—a good way down—tonsillitis, but dysentery comes sixth, and is only half as frequent as a cause of admission as malaria. Malaria, sandfly fever, and dengue between them are responsible for just over 90 per 1,000 admissions. Before the last war and for a year or two afterwards the malaria admission rates among British troops were considerably higher than among Indian, but during the last ten years the Indian rate has been very much higher than the British, and in 1939, while the admission rate for British troops was 58.1 per 1,000, for Indian troops it was 118.3. It is a different story with the dysentery-diarrhoea group. Before the last war the admission rates were higher among Indian than among British troops, but since 1919 they have been considerably lower, and in 1939 the admission rate for Indian troops was only half the figure for British, and the British figure was the highest for twenty years. Comments from commands and districts indicate that the prevalence of dysenteric infection is due to the lack of sanitation surrounding the troop areas. The seasonal incidence of these diseases appears to be different among the British and among the Indian troops: last year for the former the peak month was August and for the latter May. Respiratory diseases have been little in evidence, and there have been no epidemics other than minor outbreaks of mild influenza and pharyngitis. Nor is there any sign among the military populations of the steady increase in tuberculosis which appears to be occurring in the civilian population. Seventy pages of the report are occupied by contributions on the preventive and curative work carried out by the military medical services. A detailed account of the pathological work undertaken seems specially useful.

Public Health in Burma

The outstanding figure in the vital statistics given in the report for 1939 on the state of public health in Burma is the infant mortality rate (203.85 per 1,000 births), which is higher than in any of the Indian provinces except the Central Provinces, and three and a half times higher than in England and Wales. One explanation is that infant mortality in Burma is primarily due to malnutrition. Owing to Burmese customs and prejudices most mothers, even of the middle class who could afford a better diet, try to starve themselves during pregnancy, believing that if they live strictly on a rice diet with some dried fish they will escape the ailments from which people who take plenty of fresh and rich foods may be expected to suffer. The major epidemics in Burma are cholera, plague, and small-pox. A good deal of systematic anti-cholera work seems to be undertaken, including the purification of water supplies, control of the sale of food and drink, and

protection by means of inoculations, nearly a quarter of a million of which were performed during 1939. The most important measures against plague are those which deal with the administration of the bazaars, the storing of grain, and the enforcement of building by-laws. The number of deaths from small-pox (125) is the lowest ever recorded. The law of the country gives district councils and municipal committees power to frame rules for compulsory vaccination, and out of 105 of these local bodies ninety-three have done so. Malaria is one of the most widely prevalent diseases of the country, but its incidence cannot be exactly gauged because the registration of deaths is carried out by village headmen, who are apt to include all fatal cases of malaria as "fevers." Not only are malarious areas being reclaimed, but other measures are being undertaken, including the introduction of larvivorous fish into ponds and wells. Prof. Lyle Cummins recently visited Burma to study measures necessary to control tuberculosis. He found the incidence very low except in Rangoon. As a result of his report the Burma Tuberculosis and Leprosy Relief Association has offered Rs. 2½ lakhs (say, £18,000) to the Government towards a tuberculosis hospital in or near the capital.

ENGLAND AND WALES

London Hospital in Essex

The London Hospital, following the example of Guy's and St. Thomas's, has opened a country branch. During the last week of April an annex in Essex was taken over for the accommodation of, to begin with, 130 "London" patients, the number eventually to be 360. Sufficient staff and equipment have been provided to furnish in the country environment all the services of the mother hospital. There are four resident doctors at present, two registrars, and seventy-five nurses, but the number of nurses will eventually be increased to 180. A nurses' home is being built, and is expected to be completed in about ten weeks' time. The services of the consultants attached to "The London" will similarly be available for the Essex patients. The annex consists of twelve brick and steel huts, linked by canopied concrete paths which afford protection against the worst weather conditions. A modern operating theatre and other facilities have been put in, as well as adequate kitchens. Should the building in Whitechapel be rendered untenable by enemy action—it has already had bombs and incendiaries—the Essex institution will become the headquarters, but in the meantime the whole administration will be carried on from "The London," on the spot where the hospital has carried out its work for two hundred years. There are 350 beds in Whitechapel, and with the 360 to be presently available in Essex "The London" still claims to be England's largest voluntary hospital.

The Hospital Almoner in Wartime

The war has revolutionized the setting of the almoner's work and created a new demand for it. In a large voluntary hospital she may now find herself serving not a local district but a region. Patients from a London hospital may be distributed over a wide area of the Home Counties. One county council has appointed a travelling almoner to work in several hospitals under the E.M.S. scheme. The bombing of London and other cities has created a need for just such social service as the almoner can render. Her work has extended beyond voluntary hospitals to municipal and county; it also seems to be developing in connexion with the needs of old people evacuated to public assistance institutions. Hospitals which at the beginning of the war closed or restricted their almoners' departments have found it necessary to reinstate the almoner and extend her work. In 1939 there were fifty almoners out of work, now there are practically none. Last year seventy-five students received the certificate of the Institute of Hospital Almoners, and at the close of the year there were about 100 women in various stages towards qualification. During the first ten weeks of this year twenty-one new posts were notified, as against thirty-one during the entire year 1940. The impetus to the movement was given by the Minister of Health when at the end of last year he strongly recommended all hospital authorities in the E.M.S. to employ almoners, and intimated that part of the expense of establishing new almoners' departments might be met by Government grant. Although the work has extended from one department to another there are still one or two fields—notably venereal diseases clinics—where there is reluctance to develop almoner's work. The Countess of Limerick, speaking at the annual meeting of the institute the other day, said that the registration of women was creating some misgiving among those responsible for the training of almoners, and she felt that it was of the utmost importance that there should be a steady flow of well-educated girls for training for this important work. In view of the Ministry's encouragement to hospitals to employ almoners, it is very unlikely that suitable girls who seek this profession will be prevented from doing so by demands to do other national work.

Correspondence

Chemotherapy in Acute Otitis Media

SIR,—I have been deeply interested in two recent publications in the *Journal* on chemotherapy in acute otitis media, the first by Dr. J. B. Jessiman (March 15, p. 399) and the second by my old chief, Mr. Lionel Colledge (March 22, p. 455).

Dr. Jessiman records a series of cases of acute otitis media (all in children) which responded well to chemotherapy, though not without anxiety in some instances. I have felt reticent in expressing enthusiasm for this form of treatment, and the reason is perhaps not far to seek. I do not see so many cases of acute otitis media nowadays in their initial stages, as they are treated by my colleagues in general practice by chemotherapeutic means with marked success. But the ones I do see are those which for some reason or another have either failed to respond to the drug or are left "sitting on the fence." By this I mean that complete resolution has not occurred, yet the usual clinical picture of otitis media is scarcely recognizable. In these cases the residual affection seems to vary: in one it may be persistence of pain; in another, persistence of temperature (often without a corresponding rise of pulse rate). Where the drum has ruptured spontaneously or has been incised there may be persistence of discharge and deafness. The appearance of the patient is striking: he looks as "sick" as he feels; and following the usual clinical picture of toxic absorption he looks and feels worse when the discharge is scanty, but often with only a mild pyrexia or even none at all. Even our old friend the state of the tongue is a less reliable guide as to the need for surgical intervention.

The conduct of a case of acute otitis media after chemotherapy had apparently failed is not always as straightforward as might be expected, even though it might reasonably be assumed that half the battle had already been won. Two recent cases may be quoted.

A middle-aged man failed to respond satisfactorily to sulphapyridine after an attack of acute otitis media. A paracentesis was performed and the culture grew haemolytic streptococci. Discharge after paracentesis was scanty. There was little indication for intervention except persistent deafness and pain at night only, which was sufficient to keep him awake. I drained a mastoid full of pus, after which the whole condition cleared up rapidly.

The second case was in a man of about 30 years who was successfully treated with sulphapyridine for an attack of acute otitis media, and in spite of spontaneous rupture of the drum and discharge he had a dry ear in five days. After a week it flared up again, and when I saw him four days later he looked fairly well, but spoke like a man with a quinsy, due to a generalized oedema of his pharynx. His temperature was swinging up to 104° F., but his pulse was slow in comparison. He had a central perforation in the drum, through which was coming a copious flow of pus. He had no mastoid tenderness. His tongue was fairly clean but he felt shivery. At operation his mastoid was found to be full of pus, which welled up from the region of the tip

cells, and elsewhere there was a remarkable amount of sequestration of bone. The lateral sinus appeared normal. Culture of the pus grew haemolytic streptococci. He had a stormy post-operative period, as his temperature continued to swing up to about 101° F., and there developed a brawny swelling in his neck with extreme superficial tenderness. This swelling spread rather rapidly and sulphapyridine was reinstituted in fairly heavy doses, a check being kept on his blood picture. As he still felt shivery it was difficult to exclude a lateral sinus or jugular bulb thrombosis as a possible complication. Expectant treatment with dry heat and ichthyol dressings was sufficient to produce a free flow of pus, which welled up into the wound from below the mastoid tip. Concurrently with this his pharyngeal swelling subsided.

It is still a little difficult to be certain of the exact pathology of this sequence of events. Did the sulphapyridine control or obscure an actual sinus thrombosis? The state of the patient's neck did not encourage the application of Queckenstedt's test or invite surgical procedures on the jugular vein. Was the origin of the deep pus the result of a Bezold's type of mastoiditis, for though the bone was not very cellular the flow of pus from the ear before operation was profuse? There was little to support the diagnosis of apicitis, nor did x-ray examination of his mastoids furnish conclusive evidence.

Now I am not averse to giving due credit to chemotherapy for any beneficial effect it may have exerted in this case, and indeed it may have been largely responsible for safely piloting the patient and myself through dangerous waters, but nevertheless I had an uncomfortable feeling that the whole clinical picture was being obscured by a chemotherapeutic fog.

Mr. Colledge has made two very important points. The first is a warning that paracentesis should not be unreasonably withheld when the tablets alone have failed to abort or control the infection; and the second is the necessity for making a culture of the pus so that the optimum agent may be used.

It would seem that in the first instance treatment must be empirical as regards the selection and dosage of the drug employed, as confirmation of the infecting organism can only be obtained after discharge from the ear either starts spontaneously or follows paracentesis. Sometimes the appearance of the drum may suggest a streptococcal rather than a pneumococcal infection. But after chemotherapy has been instituted the appearance of the drum, together with indifferent physical signs, may even suggest the possibility of a *Streptococcus mucosus* infection.

I do not wish to decry or condemn for one moment the use of chemotherapy in acute otitis media, but rather to bring to the notice of those primarily concerned the possibility of failure (which some will scarcely admit) and the consequences of delaying orthodox surgical treatment. A throat swab, or better still a post-nasal swab, might give an early indication of the organism likely to be responsible for the middle-ear infection, and as a rough guide I suggest the following procedure should be adopted.

(1) Take a throat swab and if possible a post-nasal swab. (2) Institute chemotherapy (empirically). (3) If attack is not aborted or at any rate does not appear to be resolving in, say, seven to ten days (or earlier if necessary), the case should be referred to an aural surgeon, a paracentesis should be performed, and a culture be made from the pus. (4) In the light of this knowledge the optimum drug should be employed. The dosage may need alteration as well, for it must be remembered that, though adequate concentration must be maintained, overdosage may be not only dangerous but ineffective due to a state of saturation which appears to inhibit natural resistance as well as bacterial activity. In conjunction with this I have noticed that mastoid wounds seem particularly sluggish after chemotherapy. (5) If still unsatisfactory at the end of, say, a further ten days, the whole case must be reviewed and treatment of contributing factors such as nasopharyngeal infection (T's and A's in children) or mastoid involvement must be considered. A timely mastoidectomy may prevent the condition becoming chronic with consequent impairment of hearing.

Surgery should always be ready to enlist the aid of modern therapeutic measures, and such measures may even dispense with the need for the knife. But fundamental principles of surgery such as the drainage of pus and the removal of dead tissues can scarcely be discarded as yet in favour of any other means.—I am, etc.,

Canterbury, April 23. CHARLES OXLEY.

Obscure Nervous Effects of Air Raids

SIR,—It is curious that Mr. Tom Harrisson's letter (April 12, p. 573) and Dr. H. Crichton-Miller's comment upon it (April 26, p. 647) have not aroused more interest. I am sure that cases of mild stupor following severe bombing are much more common than appears. One can hardly agree with Dr. Crichton-Miller's statement that these cases are *formes frustes* of encephalitis lethargica or that a competent rhinologist could confirm the diagnosis. I feel that Dr. Crichton-Miller perhaps has made a slip of the pen, and really meant toxic encephalitis due to sinusitis, and not encephalitis due to epidemic virus infection. I would suggest that the stupors in these cases are caused by: (1) actual concussion due to the impact of blast (blast acts as a solid body, and it is easy to see how it ricochets down a road, breaking windows in patches on alternate sides of the rows of houses. Surely such impact could cause real concussion); (2) toxic encephalitis (? as suggested by Dr. Crichton-Miller) due to release of toxins, perhaps through a damaged cribriform plate or into the blood stream from sinuses, teeth, etc.; and (3) a reflex reaction without organic basis similar to the "death shamming" of animals and insects. It would be interesting to hear the opinion of an expert such as Dr. Pickworth on the toxic encephalitis theory.—I am, etc.,

London, W.1, May 3. CLIFFORD ALLEN.

Medical Man-power

SIR,—Could you, or someone more in touch than I am with the official point of view, answer the following question? Why, with so many highly qualified refugee doctors in our midst, is it necessary to send America an S O S for a thousand medical men to help us out of our difficulties? I can understand the objection to the admission of those of non-British birth into the fighting Services, but I gather that many of the recruits are required for our hospitals. If we have allowed these medical refugees to take British qualifications and to settle here, it seems illogical that we do not permit them to work for us when we are in need of their skill. I understand that a few of them have wielded pick and shovel in the Pioneer Corps. Surely this is a waste of highly qualified men.—I am, etc.,

London, W.1, May 5. KENNETH WALKER.

SIR,—Dr. Charles Franklyn in his very relevant letter (May 3, p. 690) includes the following query: "What has happened to the thousands of consultants and general practitioners from denuded areas whose practices have virtually disappeared?" From some recent experiences of my own I am moved to press that this question should be clearly answered. Owing to what we are informed is an "acute shortage of medical personnel" in Britain the services of many doctors from abroad are now being solicited and accepted. Is it perfectly certain that all our native practitioners whom the oncoming of this war has deprived of their clientele have been given full opportunity to place their experience and special aptitudes at the disposal of their country in her hour of need?—I am, etc.,

Helmsley, York, May 4. A. J. BROCK.

Overburdened Doctors in Reception Areas

SIR,—In view of the acute shortage of civilian doctors in rural areas it is surprising that an overburdened profession has done so little to enlist the much-needed, and apparently readily available, medical aid from America.

It is hardly necessary to enumerate the diverse factors which to-day make medical practice in a reception area an impossibly heavy and difficult task—a task which must be shouldered without assistance or respite and which grows more unmanageable with each fresh bombing raid on our cities, as more and more evacuees crowd into these already over-populated areas. When the exhausted doctor himself

succumbs to intercurrent infection there is panic: there is no locumtenent to take his place. Yet, as recently as last January, you published a letter by Halliday Sutherland intimating that out-of-work doctors were pining for jobs. I should be very grateful to hear from these, if they still exist. If not, would any colleagues who see their own case described in this letter communicate with me with a view to directing a joint appeal to such medical authorities in America as may be in a position to come to our aid? I have already sent such an appeal on my own initiative, and have suggested that the most effective form of aid would be the establishment of a pool or unit of American doctors in Britain, members of which would be on call to go as locumtenents or assistants to overburdened practices in the country.

If the threat of a major epidemic occurring at any time is to be catered for at all it must be done in advance; under present conditions few of us can contemplate such a threat without forebodings of disaster.—I am, etc.,

Bagshot, May 3. S. GRAHAM.

Distribution of Air-raid Casualties

SIR,—Complete co-ordination of the casualty services is of paramount importance. The Ministry of Health might issue definite instructions to be carried out. I suggest a few.

(1) The medical officer on duty at main control, whoever he is, shall be the only medical officer in the control room, and from him orders will be given to sub-control, hospitals, first-aid posts, and depots, as well as to his staff. (2) The group officer is not necessary on the main control; he should visit each hospital where casualties are being admitted. (3) There should be no necessity for medical superintendents to telephone to main control, except for a visiting team or for some special advice or requirement. Hospitals should have a rota of priority cases coming to them as outlined below; and Control, knowing the "bed state," could advise of coming cases. (4) Hospitals with four operating theatres should take precedence over those with lesser number and should be given the first thirty cases; those with two theatres the next twenty cases; and those with a single theatre the next ten cases. When these numbers have been distributed sufficient time will have elapsed for the same distribution to be gone through as many times as necessary. Thus there will be no delay in treatment nor any overworking of the surgical staff. There should be no misuse of medical man-power by putting such on "one-way traffic," which can be done by a nurse or orderly. (5) The Minister of Health should control hospitals, first-aid posts, depots, and first-aid parties, nurses, ambulances, and rescue parties. The worth of the rescue parties is mainly life-saving *during a raid*, and they should work in conjunction with the first-aid parties, who should be taught rescue work forthwith. Review should be made of the physique and competence of all depot personnel. (6) The incident officer is one of the police officers; I submit that a medical man should be the director for the competent direction of first-aid parties. (7) The importance of a mobile unit with its doctor cannot be over-emphasized, especially in classifying cases and deciding what is a serious case. Conditions of air-raid casualties mislead first-aid party men: if we get more casualties per bomb the value of the mobile unit will be better recognized. (8) Every doctor of main control, every clerk there, every M.O. of first-aid posts, every medical superintendent of a hospital, every depot superintendent, every sub-control, the head of the fire brigade, A.R.P. officers, and every ambulance driver should be given a copy of the instructions for the whole service. (9) As the M.O. at control knows the bed state and the distribution of the cases, there will be no switching of ambulances except to circumvent road blockages, about which both the incident officer and main control would have information, but drivers of ambulances should know all alternative routes. The responsibility for this rests on depot superintendents, who should test them from time to time. (10) The duty of calling outside help of any kind rests with the A.R.P. officer after the casualty medical officer has advised him of its needs. (11) Alternative "shadow schemes" for hospitals are already a duty of the M.O.H. and group officer. (12) Ambulances to remove cases from hospitals during a raid are not practicable or advisable.—I am, etc.,

April 28. CO-ORDINATION.

Mobile Units

SIR,—As some correspondents consider mobile units to be of little use I should like to make the following suggestions based on experience in one of our most heavily attacked towns. (1) Where a large number of casualties are reported a doctor and the unit are sent. (2) Where there are a few casualties in a *highly dangerous* place a doctor and a nurse are sent if serious cases are reported requiring a doctor. (3) The vast majority of incidents will consist of several houses bombed in one or more adjacent roads. If casualties are present *or suspected*: (*a*) in one house a doctor and a nurse are *always* sent if possible; (*b*) in several houses, a doctor and the unit are dispatched.

The routine in 3 (*b*) is that the doctor with a nurse and several auxiliaries rapidly visits all casualties in his own car, leaving a nurse at each house if required. He thus grasps the whole situation at once and acts as the occasion demands. Where buried persons are likely to be dug out soon nurses are left to call the doctor when required. It should be noted that the personnel are scattered in case of bombs falling. The van, which has followed after the doctor's car, is stationed near the centre of the incident.

The doctor should be able to go with a nurse to any place strictly local to his station whenever he has heard a bomb drop there and to call out his unit later if required. He will notify the Report Centre of his movements before leaving his station, and if he has to remain on the incident he is visiting he will send a report through a warden and warden's post to the Report Centre. Much valuable work is done in this way, especially as the doctor (and unit) is often there before any first-aid parties.

It is very important that doctors should carry bags stocked for emergencies and nurses should carry light packs on their backs containing dressings, etc. This enables the doctor to work (as he often must) at some distance from the van, prevents loss of time in fetching things, and minimizes risk to life in unnecessary walking about. The van should be adapted so that injections of A.T.S. can be given in it at night if necessary.

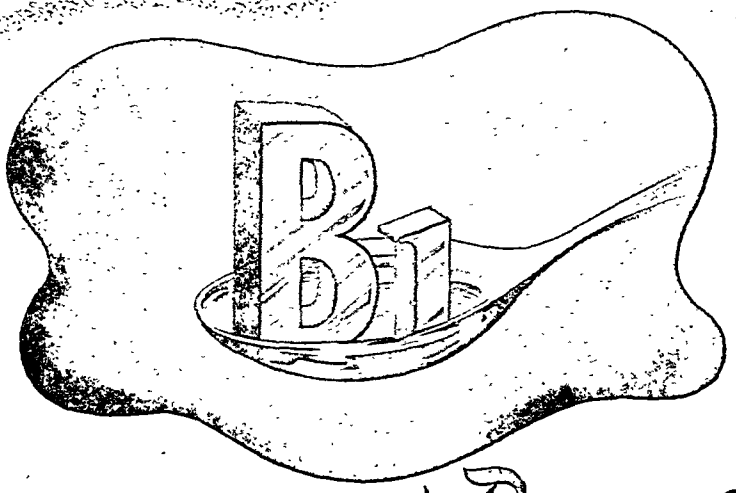
I completely disagree with the suggestion that a doctor should wait until someone (generally at first a member of a first-aid party) reports a case of severe haemorrhage or one requiring morphine, because usually the quickest way to obtain a doctor's help then is to rush the patient into hospital. Under the scheme outlined the doctor is on the scene before or soon after the first-aid party. If these suggestions are carried out there will be no doubt about the value of mobile units.—I am, etc.,

April 23. MAURICE E. J. PACKER.

Bureaucratic Surgery

SIR,—I suspect that there are many members of the E.M.S. who feel that Mr. Norman Lake voiced their feelings in his letter (April 19, p. 602). On the surface, it would seem almost insulting to suggest that scalp wounds cannot be dealt with satisfactorily by a general surgeon; or that he is so "dull" that he may overlook the possibility of injury to bone or brain. Incidentally, how many surgeons endeavour to ascertain the presence of injury to underlying brain if the skull is found to be intact? I wonder what comment Mr. Lake would make upon the following experiences of recent months, and what steps he would wish taken in an attempt to avoid repetition of such errors.

(1) *Case of 1-in. scalp wound:* stitched at F.A.P.; fracture with penetration of brain by bone fragments not detected until one week later; ultimately, death from septic encephalitis. (2) *Case of compound depressed fracture, with involvement of the brain:* inadequate operation by an (?) inexperienced surgeon in a general hospital, without even shaving the hair; *B. welchii* infection, ultimate recovery. (3) *Case of extensive compound depressed fracture, with involvement of the brain:* operation by a surgeon competent in general work; the hair not clipped for more than 1 in. from skin edges. (4) *Suture of an extensive irregular scalp laceration without excision:* inadequate shaving; wound infected and skin necrosis; C.S.F. leaked through infected wound from undetected small perforating fracture of the vault.



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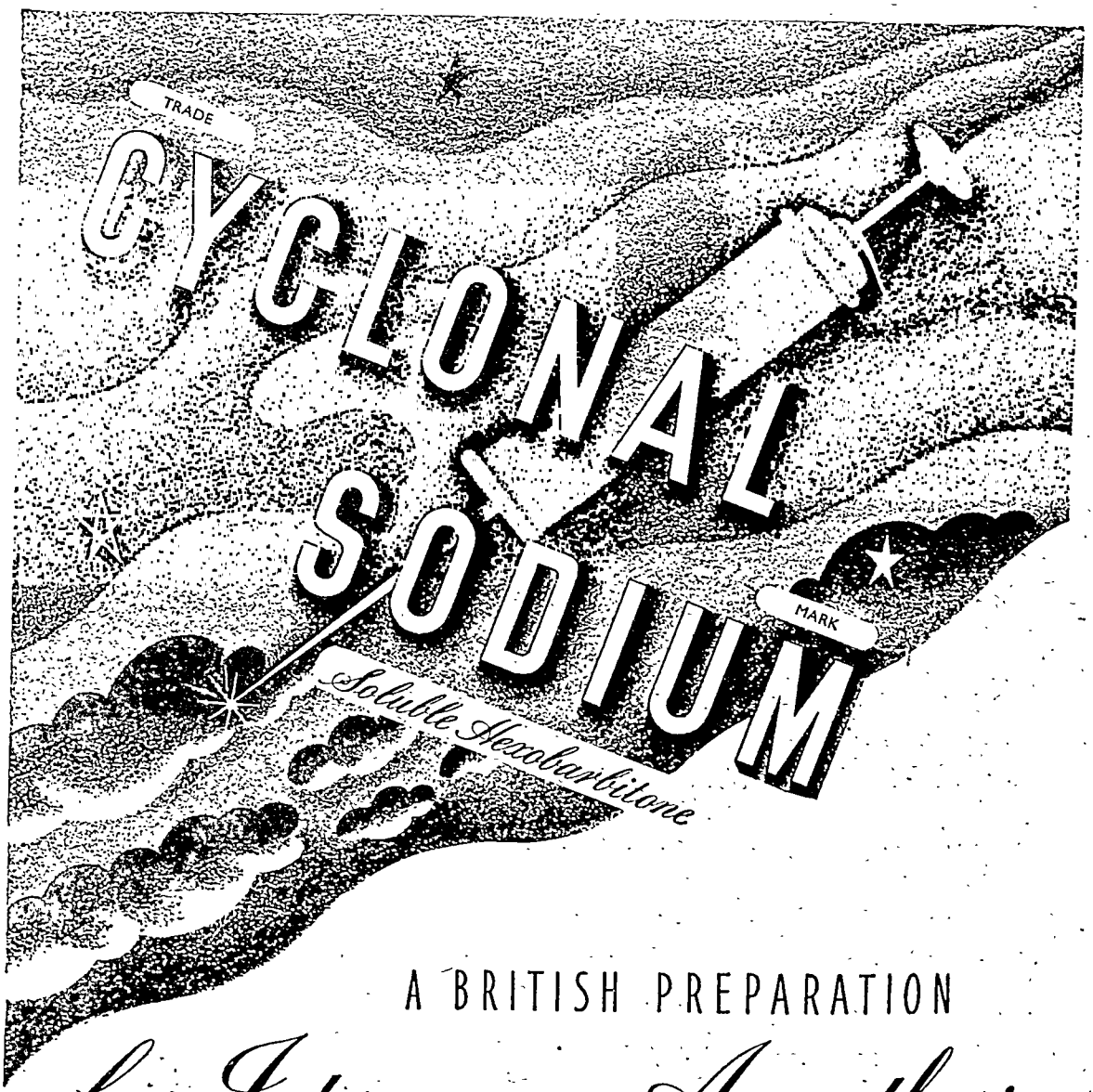
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These are the more serious cases; others less grave could be added to the list.

No one doubts the ability of Mr. Lake or indeed any other competent surgeon to excise a scalp wound; but since casualties are many and the patients can have no choice in selecting their surgeon, and since the judgment and ability of hospital staffs vary in degree, an effort must be made to avoid errors and omissions which so easily lead to a fatal issue. Scalp wounds can be trivial, but they can also conceal grave dangers; therefore they should always be regarded as potentially serious until proved otherwise.

The reason for transferring cases of nerve injury is surely very sound. Nerve suture itself is only one item in the conduct of the case. After-care is at least as important, and requires prolonged treatment, for which the best facilities are to be found at orthopaedic centres, where there is the further advantage that the surgeon who operates can watch the result of his handiwork.

The present methods of solving these problems will undoubtedly cause heartburning and perhaps resentment in the surgeon who wishes to tackle everything. As always, the acid test is, What is best for the patient?—I am, etc.,

D. W. C. NORTHFIELD, M.S., F.R.C.S.,
April 28. Surgeon in Charge of a Special Head Centre.

Orthopaedics and Orthopaedic Surgery

SIR,—The annotation on "Physical Medicine, Orthopaedics, and the Services" (April 26, p. 633) calls for comment. Instead of dealing with orthopaedics, the article follows a train of reasoning based upon references to orthopaedic surgery. Is this not a case of *petitio principii*? It begs the question. Orthopaedics and orthopaedic surgery are not one and the same thing. Orthopaedic surgery is only a part, and actually not a major part, of orthopaedics. The origin, development, and growth of orthopaedics have rested mainly upon matters relating to physical education, the problems which confront medicine as distinct from surgery, and upon the treatment of disabilities due to trauma. Orthopaedics has no real balanced future considered merely as orthopaedic surgery alone. The article differentiates so seriously against orthopaedics in favour of physical medicine that it amounts to special pleading. Considered on the basis of the actual title of the article, its recommendations cannot, in my opinion, be sustained.—I am, etc.,

Edinburgh, May 3. W. A. COCHRANE.

Agglutinin Titres of Pooled Sera

SIR,—Your correspondent Dr. J. T. Rice Edwards (April 26, p. 644), commenting upon the case reported by Drs. R. Mayon-White and O. M. Solandt from this depot, hazarded the opinion that iso-agglutinins may be present in appreciable quantities in pools of sera prepared from the bloods of Group A, B, and AB donors. In the preparation of such serum pools at the S.W. London Blood Supply Depot the serum is pipetted off from each individual bottle, together with a small number of red cells in suspension. When these sera are mixed the agglutinogens of these red cells help to neutralize the corresponding iso-agglutinins of the pooled sera. The methods employed at the other depots, from which pools of serum are obtained for the Medical Research Council's Serum Drying Unit which supplied the dried serum used in the treatment of this case, also involve a slight contamination of the serum with red cells.

Moreover, the sera themselves contain in solution group-specific substances (Schiff, *Klin. Wsch.*, 1924, **3**, 679). This observation has been confirmed in this depot by Dr. E. F. Aubert. In a paper shortly to be published he shows that the mixture of sera, Seitz-filtered to remove red cells and red cell debris, of Group A and B donors results in a diminution of the respective beta and alpha iso-agglutinins to titres which would be of no significance in transfusion work.

Pools of serum produced in this depot have been shown to have agglutinin titres so low that no naked-eye agglutination with A and B red cells can be detected. Plasma pools have similarly low agglutinin content.—I am, etc.,

J. F. LOUTIT,
April 28. Medical Officer in Charge, S.W. London Blood Supply Depot.

Injury and Internal Disease

SIR,—The paper by Dr. G. F. Walker (May 3, p. 659) will, I trust, attract wide attention. I for one should like to express to the author my admiration for its clarity and precision.

Personal experience in clinical, medico-legal, and literary work on two of the subheadings—cancer and diseases of bones and joints—suggests that two small additions might be welcome. The first concerns the author's Table III, in which he gives four generalizations as to the shortcomings and conflicting views in the literature. Here I should like to add one which to me always seemed most impressive. It is the bewildering variety of meanings read into the term "trauma." The author rightly uses it only occasionally. "Injury" is much better and less apt to be twisted to fit into strange theories. By a curious coincidence a classical example of what can be done with the words "trauma" and "traumatic" is provided in the same issue in the letter by Dr. C. Leleu on the cause of appendicitis (p. 689). Do we really agree that its cause is a "trauma"? I doubt it. But the point is that what later in this letter is described as "trauma to the blood vessels" is no trauma at all. The word "trauma" means nothing but injury. It is its translation into Greek. Once we begin using it as an equivalent for all kinds of pathological changes—congestion, irritation, physiological strain, the so-called mechanico-functional trauma to bones and joints of German writers—it assumes so many ill-defined meanings that it is in danger of losing its only true and well-defined one—that of injury or accident.

The second addition refers to the much-discussed problem of the part injury is said to play in the causation of sarcoma—more especially bone sarcoma, giant-cell tumours, and bone cysts. In a paper on "Osteitis Deformans Paget and Osteitis Fibrosa v. Recklinghausen" (*Ergeb. Chir. Orthop.*, 1933, **26**, 381) I tried to show that neither should ever be regarded as being commonly due to injury. Behring (*Acta chir. scand.*, 1930, **66**, 197) found in his large series of patients with sarcoma of the long bones that only 31% mentioned injury in their history; of those with giant-cell tumour of the long bones 33%. The mere possibility of a connexion he admitted in 17.5 and 18% respectively. As to bone cysts and "brown tumours," only six out of 165 cases reported between 1925 and 1932 by different authors seemed to me to admit injury as a possible cause, while their authors thought of it in 20. In twenty-four of my own cases of bone cysts and "brown tumours," four patients only mentioned injury spontaneously; all were asked, and the majority expressly denied that any injury had been suffered.

It is well to remember that, although cysts and benign and malignant tumours are not very rare in the jaws, none was then (1932) known to have followed fractures or the innumerable lesser injuries involved in boxing. Nor did I find a single case where a tumour had been ascribed to such cause as the severe jolts, kicks, infractions, or fractures at either football or ski-jumping. These statements apply, of course, only to point (*a*) in Table I of Dr. Walker's paper—that is, to injury as the only cause of the disease in any given case.—I am, etc.,

London, W.1, May 3. L. S. MICHAËLIS.

Subcutaneous Ligature of Varicose Veins

SIR,—I have read with interest the article (April 26, p. 626) by Dr. H. S. Russell describing subcutaneous ligature of varicose veins. I feel that it would be a pity if this method became widespread without a little further thought. It is clear that his operation cannot be performed at or near the saphenous opening, from the risk of damaging more important structures. It was the haphazard ligature of the saphenous vein somewhere in its course that brought the so-called Trendelenburg operation into disrepute. It was soon found that unless the saphenous was ligatured at its entry into the femoral vein, *and all its tributaries also ligatured*, recurrence would take place from anastomoses above and below the ligature.

The proper ligature operation demands a complete exposure of the vein at its highest point. This can be and is usually done as an out-patient procedure under local anaesthesia, and it is an important part of the treatment that the patient should not be put to bed. It therefore incommodes the patient no

more than Dr. Russell's blind method, which must be at the best uncertain. But the operation is not to be considered easy, and demands all that care and attention associated with surgical procedures and perfect theatre technique, otherwise tragedies will occur. It is not an advance to operate in a consulting room, nor is it ever wise to carry out any treatment, much less one associated with needle pricks, with the patient standing up.—I am, etc.,

NILS L. ECKHOFF, F.R.C.S.

Guy's Hospital, S.E.1, April 28.

SIR,—Dr. H. S. Russell (April 26, p. 626) is to be congratulated on his method of temporary subcutaneous ligature of varicose veins with silkworm gut inserted by means of a perineal needle. Where the vein is not too obscured by subcutaneous fat the suture can be inserted even more simply by passing a hypodermic needle under the vein and threading the suture through it. As the puncture is similar to what will be used in injecting the veins no local analgesic seems called for.—I am, etc.,

Birmingham, May 3. J. W. RIDDOCH.

Natural Therapeutic Agents

SIR,—May I offer a practitioner's applause to Captain Leslie Saunders on his admirable article (April 26, p. 624) on derris root and scabies, in which he describes the efficacy of the natural derris root in the treatment of scabies. It has occurred to me that pharmacological research, while concentrating on pure chemotherapy, has left untapped many natural therapeutic agencies. For instance, the virtues of rhubarb root, a favourite and valuable remedy with all practitioners, have not been completely surveyed. Is there not some pharmacological relationship between the anthraquinones of rhubarb and its allies and the naphthaquinones of vitamin K? They both appear to improve the body by liver action. Or again, would rhubarb be of more value in psoriasis than its constituent chrysarobin? One hesitates to reintroduce the idea of pleomorphism into pharmacology, but I think it is worth consideration, "lest we miss the many-splendour'd thing."—I am, etc.,

Kearsley, Lancs, April 28. D. OCKMAN.

Adrenal Grafts in Addison's Disease

SIR,—Dr. J. J. Conybeare (May 3, p. 688) doubts whether Drs. Katz and Mainzer's case of successful grafting of an adrenal gland had Addison's disease because there was no pigmentation.

That adrenal grafting can be effective in cases of Addison's disease seems substantiated by the fact that in a deeply pigmented, bedridden patient with an extremely low blood pressure I grafted an adrenal in May, 1935. The patient was shown at the Royal Society of Medicine by Dr. Keele in November, 1935, and again in September, 1939. I saw her quite recently; she stated that she was quite well and was working as an Army cook. She was still deeply pigmented.—I am, etc.,

London, W.1, May 2. HAMILTON BAILEY.

Renal Complications of Sulphapyridine

SIR,—Attention has been drawn recently to the dearth of literature in this country on the renal complications of sulphapyridine (Major F. R. Fletcher, February 15, p. 242; Mr. J. C. Leedham-Green, April 19, p. 586). I think it may be of interest to mention a case of haematuria and anuria following sulphapyridine therapy.

The patient, a man aged 46, was admitted to hospital with lobar pneumonia. On January 28 sulphapyridine was given in the usual dosage, and on February 1 haematuria, with pain in both loins and tenderness, was noted. This was followed by complete suppression of urine. The drug was stopped, a total dosage of 26 grammes having been given. On February 2, 40 c.cm. of a 50% solution of glucose was given intravenously and hot packs applied to the loins; the anuria, however, persisted. The patient became drowsy on the evening of February 3; his tongue was dry, and the non-protein nitrogen content of the blood was 88 mg. per 100 c.cm. Five hundred c.cm. of 4.285% sodium sulphate with 10% glucose in normal saline was given intravenously by the drip method. The following morning the patient passed three ounces of rather thick reddish-brown urine, followed later in the day by gradually increasing amounts of macroscopically normal urine. Renal function tests performed some days later revealed no impairment of concentrating power.

The response to the intravenous administration of sodium sulphate solution is worthy of note in view of the successful application of a similar solution in Mr. J. C. Leedham-Green's case.—I am, etc.,

Liverpool, April 29. J. ROWLAND HUGHES.

Sulphonamides in Diphtheria

SIR,—I read with interest Drs. A. Kefalas and M. Goldin's letter (April 26, p. 648) on their experience of the value of the sulphonamide group of drugs in the treatment of diphtheria. These should be of great value, especially in those cases complicated by an additional haemolytic streptococcal infection.

Dr. R. A. Q. O'Meara and Dr. P. A. McNally stated in a paper read before the Section of Pathology of the Royal Academy of Medicine in Ireland on February 14 that by combining sublethal doses of diphtheria toxin derived from the Parke-Williams No. 8 strain with relatively insignificant amounts of other bacterial toxins, effects can be obtained similar to those previously produced by combination of the classical diphtheria toxin with extracts of gravis strains. If guinea-pigs are inoculated subcutaneously with such mixtures they develop large swellings with increased local necrosis and later paralysis. Their work suggests, at least to me, that even the presence of a mild additional haemolytic streptococcal infection to the diphtheria already present seriously aggravates the condition.

My experience is that these complicated cases do well if treated with adequate serum and the proper dosage of the sulphonamide group of drugs. It is customary in other fevers to give a large dose of one of these drugs at the start, and subsequently to give smaller doses to keep up the concentration of the drug in the blood. Unfortunately, if these drugs are given orally in the usual dosages there will be a tendency in certain cases to set up vomiting, which may seriously jeopardize the patient's chances of recovery, especially as a diphtheria case is peculiarly liable to cardiovascular complications. These drugs should preferably be given by the intramuscular or the intravenous route. If this is undesirable, great care should be taken in giving the drugs by the mouth.—I am, etc.,

G. E. DONOVAN,
April 29. Medical Officer of Health, Gorseinon, Swansea.

"Heat Convulsion"

SIR,—Dr. S. E. Osborne's case of "heat convulsion" (May 3, p. 689) appears to be due to anoxia rather than to heat. Convulsions due to hyperpyrexia are usually marked by a temperature around 110° F., a hot dry skin, considerable cyanosis, and preceded by malaise, headache, and restlessness for a period varying from a few hours to a few days. The danger of anoxic states supervening during nitrous oxide anaesthesia is not sufficiently appreciated, but thirteen cases were reported and the literature reviewed by Courville in 1936.[1] Courville emphasizes that cyanosis is not a necessary prelude, and that in toxic states severe cerebral damage can be done by comparatively mild degrees of anoxia. The free perspiration, excessive salivation, tachycardia, twitchings of the facial muscles, and clonic movements of the limbs suppressible by barbiturates, form a typical picture of an anoxic state of moderate severity. The condition cannot be relieved by the administration of oxygen, since the cellular changes in the brain are irreversible, usually temporarily so, as in Dr. Osborne's case, but sometimes permanently so with lifelong dementia as a sequela.

One seems to be justified in assuming that in the present case the toxic state of the brain tissue rendered it especially

[1] *Medicine*, 1936, 15, 129, 245.

sensitive to anoxia and that it suffered damage of this type despite the proportion of oxygen inhaled. On the other hand, it is possible that a temporary fault in the anaesthetic apparatus resulted in more nitrous oxide being given than was intended.—I am, etc.,

Sutton, Surrey, May 3. A. M. SPENCER.

Paste for Burns

SIR,—The use of "euglamide" in the treatment of burns as described by Dr. J. M. Robson and Mr. A. B. Wallace (March 29, p. 469) has proved to be very successful. Since the publication of this article we have been using this paste regularly for all cases of second- and third-degree burns, and have noticed quick healing without development of sepsis. The number of cases treated was considerable, due to recent enemy action. It has now become almost a routine treatment. The same paste has also proved to be very useful for ordinary septic lacerated wounds and abrasions. We apply the heated euglamide paste directly to the septic area. This paste is of similar consistency to antiphlogistine and applied in the same way. The wound is usually clean after one to two days of treatment and healing takes place rapidly. We also use it for impetigo and other septic skin conditions. We have prepared a solution of 5% sulphonamide in equal parts of glycerin and vitaminized oil, which we use for packing large infected wounds. We have called it euglamide liquid, and find it satisfactory. Instead of albucid, the sulphonamide used by Robson and Wallace, we use sulphanilamide with satisfactory results.—I am, etc.,

April 24. E. FRANKEL, M.B., B.S.

Convulsion Therapy by Electricity

SIR,—Dr. Gerald Caplan (April 26, p. 647) surely applied a peculiar individual twist to the interpretation of my letter (April 12, p. 571). I did not state that the faradic shock method described by him (March 29, p. 479) was "fully investigated in the nineteenth century," but only that closely similar methods were then described. My very brief description of Allbutt's method was prompted only by the fact that the work was carried out in this country. For an early account of the uses of faradism I would refer Dr. Caplan to Erb's *Handbook of Electro-therapeutics*, translated by L. Putzel, London, 1883.

Objection is also taken by Dr. Caplan to my suggestion that the convulsion described by him might have been due to the summation of subliminal stimuli. These he states were applied at intervals of "twenty-four hours." Nowhere in Dr. Caplan's paper do I find the words "twenty-four hours" used, but he does state that "fifteen shocks of half a second's duration are given at intervals of half a second."

To Dr. Caplan's criticism that I am more familiar with the literature of the nineteenth century than of the present, I can only reply that I had not had a pre-view of the April number of the *Journal of Medical Science* when I wrote on March 31. Incidentally, Dr. Caplan has not yet produced evidence to show that electric convulsion therapy might give rise to brain lesions and lung abscesses, as implied in his generalization. The references quoted by him in his paper are concerned with the pharmacological convulsants. Surely Dr. Caplan's fears with regard to the serious import of vertical fractures have been set at rest by the conclusions of Drs. Cook and Sands, who are of the opinion that "there is no justification for allowing the risk of vertebral fractures to preclude convulsion treatment in suitable cases."

Dr. Caplan envies me my "good luck" in not having any complications with electric convulsion therapy. I might here state what seems to me a significant fact—namely, that I was less fortunate, when using cardiazol, for two patients sustained a fractured femur before this method had been in use for a year.

I must regard Dr. Caplan's concluding paragraph as the soft answer that "turneth away wrath," for I certainly have no objection to any form of scientific research that will throw some light on the problem of mental disease.—I am, etc.,

Warlingham, Surrey, April 30. JAMES S. MCGREGOR.

*** This correspondence is now closed.—ED., *B.M.J.*

Sims's Operation: Then and Now

SIR,—The profession is indeed greatly indebted to Prof. Chassar Moir for his learned address on the above subject (December 7, 1940, p. 773). Although it is believed that vesico-vaginal fistula is nowadays less common in the European countries, it is not so in the East, the reason being that here expectant women are slow to seek medical aid and that midwifery and gynaecology are not practised as a specialty. Here is a case in point.

One young woman, otherwise healthy and in the prime of life, after having undergone more than one operation for vesico-vaginal fistula without success, was leading a miserable life, discarded by her husband. When she was seen by me she was using a cone-shaped piece of soft wood for plugging the fistular opening, as advised by a local "leech." She was radically cured by me by an operation performed on her in 1935, and has been thus rescued from a "distressing and unsocial condition."

I have on a previous occasion (August 1, 1936, p. 260) written to your *Journal* on this operation, following an article by Mr W. Arch. Mein (June 13, 1936, p. 1207). In my experience three chief conditions are essential for the simple Marion Sims operation to be successful in the very first attempt. They are: (1) Free internal exhibition of a safe and reliable modern urinary disinfectant some days preceding and following the operation. (2) A large indwelling over-size rubber catheter, about 3/8 inch in diameter, nearly the size of a rectal or stomach tube. It must be remembered that the adult female urethral passage is dilatable to that extent with little pain or permanent damage, provided it is dilated with careful technique. (3) Avoiding unnecessary post-operative irrigation of the bladder. Irrigation, especially a forcible one, invariably leads to distension of the cystic wall, causing the lotion to force its way between the stitches. The over-size catheter permits ready and free flow of the urine, allowing the bladder to rest and remain nearly empty till the wound is healed permanently by primary or secondary union, according to the method of repair.—I am, etc.,

Colombo, March 10. I. DAVID.

Medical Planning Commission

SIR,—Many individual voices have been raised recently in discussion of the organization of medical services, and from these individual views, expressed in the medical press and elsewhere, it is evident that considerable apprehension exists.

We of the Sutton and District Medical Society have, at our recent meetings, been giving much time to free discussion of the problems that lie ahead. In this letter we wish, as a body, to bring our views before the profession, and to give expression to doubts and dissatisfactions that we believe to be widespread. We are a society of sixty members, comprising general practitioners, medical officers of health, specialists, and medical women, and can fairly claim to represent all branches of medical opinion in this area of Surrey. However divergent our professional activities and interests, we are substantially agreed on the following points:

(1) We would welcome such evolutionary changes as might be indicated by past experience and by present and future needs, but we view with some apprehension the suggestion, indeed the threat, of sweeping reorganization, perhaps without sufficient "ventilation" or adequate discussion or debate by the profession as a whole. And especially would we regret the handing over of the profession to bureaucratic control. We believe this would be an unhappy change for both the public and ourselves.

(2) We are impressed by the fact that the B.M.A. is regarded with indifference or distrust by numbers too great to be ignored. That such an attitude should exist is to be regretted, but we are convinced that this feeling is widespread and very real.

(3) The Medical Planning Commission is, we think, unrepresentative in character and undemocratic in origin.

(4) In view of the above we feel we must recognize that at the present time there does not exist any body which commands the confidence of the majority of the profession, or can justly claim to represent it.

(5) There is therefore an obvious need for such a body, to interpret medical opinion, and to speak and to negotiate with authority on its behalf.

(6) The British Medical Association seems to us to be naturally the body of choice, but essentially a revitalized Association, able to attract those of the profession without its gates and to inspire those within.

(7) We have, in common with many others, constructive proposals to offer as to the direction of medical progress, but it appears to us that the primary necessity is the formation of this body. Meantime, we consider it of the greatest importance that societies similar to our own throughout the country, or groups formed for this specific purpose, should bring these matters into discussion, and publish their views in the medical press. We feel this would be a real contribution towards the solution of our difficulties.—We are, etc.,

T. H. WHITTINGTON,
J. CRAWFORD,
Hon. Secretaries, Sutton and District Medical Society.

April 28.

SIR,—At a meeting of the Hampshire Local Medical and Panel Committees held on April 23 last, the objects and constitution of the Medical Planning Commission were fully discussed by my committee, and the following resolution was unanimously adopted: "This committee is of opinion that no findings of the Medical Planning Commission as at present constituted should be submitted to the Government for approval without the general approval of the body of the profession through the Local Medical Committees."—I am, etc.,

G. A. E. ROBERTS,
Hon. Secretary.

May 1.

Certificates by Medical Practitioners

SIR,—I was very pleased to see the Warning Notice by the General Medical Council regarding certification printed in your issue of April 19 (p. 600). I and my colleagues who hold posts as factory medical officers are having many difficulties thrust upon us as the result of lax certification. These certificates are usually presented to excuse the person from fire-watching, shift work, night duty, etc., and many of them, while they may seem reasonable to lay members of the management, are ludicrous in the extreme when subjected to the understanding eye of a fellow member of the profession. Many managements will not accept these certificates unless confirmed by the factory medical officer, and it is very often extremely difficult to confirm them "on soul and conscience," as they say north of the Tweed. The doctor who gives them and the doctor who receives them are therefore both placed in a very awkward position, and the subject of the certificate is placed in a bad psychological position also. He thereafter has a constant grouse, and this in turn affects his ordinary work.

As an example of the kind of certificate often received perhaps I may be allowed to quote one which was handed to me yesterday. It states: "Mrs. X is suffering from neurasthenic fits and Mr. X is unable to leave her alone at night."—I am, etc.,

J. B. WRATHALL ROWE.

April 23.

J. B. Sandoval (*Thèse de Paris*, 1940, No. 127), who records twenty-six cases in patients aged from 2 months to 62 years, states that *B. pyocyaneus* septicaemia, which was first described by Ehlers in 1870, is a very rare condition of which two forms may occur. The first form consists of a pure septicaemia without any appreciable manifestations at the site of entry and without secondary localizations, while the second form is a combination of septicaemia and pyaemia. The source of the disease may be the skin, especially in the child, and the intestinal tract in the adult. Initial cutaneous lesions are exceptional in grown-up persons, and when they do occur *B. pyocyaneus* does not play an important part and is merely a secondary infection. A predominantly hepatic localization in some patients may be explained by the lack of resistance of a liver which has been damaged by a previous infection. Drugs are of no value in the course of the disease.

Medico-Legal

CORONERS' WARTIME POWERS

The exceptional conditions of war have made it necessary to introduce a shorter procedure for the presumption of death in cases where the body of a person who is suspected to have been killed in an air raid cannot be found. By Regulation 30A of the Defence Regulations, when a registrar reports to a coroner that he has reasonable cause to believe that a death has occurred in consequence of war operations and that the body of the deceased has either been destroyed, cannot be found, or is in a position from which it cannot be recovered, or has been buried as that of a person unknown or as some other person, the coroner may hold an inquiry. He must give notice, to be posted in a public place, and he holds the inquiry without a jury and in private, unless the Home Secretary otherwise directs. If he finds the person to have died the finding has the legal force of a presumption of death made by leave of the High Court. The procedure will remove what would otherwise constitute impassable barriers of time and expense in the administration of the estates of air-raid victims.

AGREEMENT IN MEDICAL EVIDENCE

In a personal injury action there is much to be said for an arrangement by which the doctors on both sides can consult and if possible agree on the evidence concerning the extent of the injury which they will give in court. By so doing it is often possible to obviate the need for a number of medical men to give up several hours or days to attend as witnesses. The courts recognize this possibility and, in the preliminary proceedings, make provision for it in suitable cases. It is right, however, that the practice should be limited by the requirements of each particular case.

In a recent action[1] a workman had his right hand crushed in the rollers of a machine, and the sole issue in the action was the amount of damages. On the summons for directions the District Registrar made the usual order for the medical reports to be agreed between the parties if possible and, failing agreement, medical evidence to be limited to two witnesses on each side. Attempts were made without success to agree the medical reports, and when the action was heard the only evidence given was that of the workman and of a doctor called by him who said that the man's hand was permanently disabled and that in his opinion nothing could be done to improve its condition. Mr. Justice Croom-Johnson expressed disapproval of the calling of the doctor as a witness, taking the view that the medical reports should have been agreed. Disregarding the doctor's evidence he assessed himself the working capacity of the man and allowed him only £550 damages. On appeal, these damages were increased to £1,268 8s. The Lords Justices said that the judge had been wrong in law in following his own ideas rather than the evidence of the doctor, and his estimate had been entirely erroneous. It was very unfortunate, said Lord Justice MacKinnon, that a judge should discourage the calling of a doctor in such a case, as it was often of the greatest possible advantage that the doctor should be present and be subject to cross-examination, and in a position to explain what he had written in his report. Lord Justice du Parcq added that it was a great mistake to think that it was always useful to order the medical reports to be agreed and that this direction should always be included. In a case where prognosis was an important matter it was most desirable that a doctor should be present in court to answer questions which the judge might wish to ask, if for no other reason.

[1] Proctor v. Peebles (Papermakers), Ltd., *Times*, March 15.

It is obviously desirable that the court trying a personal injury action—or any other—should have the best evidence obtainable. It is not desirable that medical men should feel compelled to reach an agreement against their true judgment. Their Lordships' remarks applied, of course, to a case where there was no agreement. When an agreed statement is before the court the judge would doubtless be satisfied if one medical man were present to clear up any uncertainties that might arise.

FALSE DECLARATION IN WORKMEN'S COMPENSATION

A workman was incapacitated by nystagmus, and when examined by a surgeon on behalf of the employers he disclosed that he had previously suffered from the disease. The surgeon made a note to this effect in his report, and the employers began to pay compensation at the full rate of 30s. a week, although when he had first been employed by the firm in 1928 he had signed a declaration that he had never had nystagmus. He signed another similar declaration in 1933. In fact, as he admitted at the hearing, he had suffered from nystagmus at various times, had been incapacitated for various periods lasting over seven years, and had been medically certified five times as suffering from it. Section 43 (1) (*b*) of the Workmen's Compensation Act, 1925, lays down that if it is proved that the workman has at the time of entering the employment wilfully and falsely represented himself in writing as not having previously suffered from the disease, compensation shall not be payable. The county court judge found as a fact that his false declarations had been wilfully made. Nevertheless, he held that the payment and receipt of compensation constituted a "binding and concluded agreement" under the Act whereby all questions of liability between the parties were settled. The firm appealed,[1] but the Court of Appeal upheld the judge's award. There is, by Section 21, no difference in effect between an agreement and an award of a county court judge, and if an award or an agreement is recorded and registered in the county court they have precisely the same validity. An unrecorded agreement (such as this) is just as effective as an unrecorded award, and precludes both parties from raising anew any question which would have been relevant when it was negotiated.

[1] Pearce and Partners, Ltd. *v.* Birch (1941). 1 All E.R. 343

The Services

MENTIONS IN DISPATCHES

Lieut.-Colonel A. H. Whyte, D.S.O., Lieut. (Temporary Major) P. H. Newman, D.S.O., and Lieut. J. M. Muir, D.S.O., R.A.M.C., have been mentioned in dispatches for distinguished services in the field.

EFFICIENCY DECORATION, TERRITORIAL ARMY

The Efficiency Decoration of the Territorial Army has been conferred on Colonel F. R. Sandford, M.C., and Lieut.-Colonel A. Swindale, R.A.M.C., T.A.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL ARMY MEDICAL CORPS

Captain ALFRED ANTHONY FERRO died of wounds on March 19. He was born in Malta in 1914 and was educated at the Royal University of Malta, graduating M.D. in 1937. He joined the R.A.M.C. soon afterwards, and was promoted captain in May, 1939.

Captain WILLIAM BRADFORD FOSTER died in Middlesex Hospital on April 15. He was born at San Francisco in 1913, the eldest son of Mr. and Mrs. W. D. Foster of East Molesey, and was educated at Cranleigh School and St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. in 1937. In the following year he graduated M.B., B.S. of the University of London. He had held the posts of resident surgical officer at Worthing Hospital and resident medical officer at the Kent and Canterbury Hospital. He joined the R.A.M.C. early in 1939. He leaves a widow and one son.

The name of Captain CHARLES EDWARD MCCLOGHRY is included as "Died" in an Army Council casualty list published on April 30. He graduated M.B., B.Ch., B.A.O. of Queen's University, Belfast, in 1936, entered the R.A.M.C. as lieutenant in April, 1937, was promoted captain a year later, and saw service in Palestine. He had been a member of the British Medical Association since 1937.

The death from wounds of Lieut. JOHN MURDOCH MCKILLOP is announced in an Army Council casualty list published on May 2. He was educated at the University of Glasgow, where he graduated M.B., Ch.B. in 1938. His home was in Glasgow.

INDIAN MEDICAL SERVICE

A list of casualties in the Indian Army, published by the India Office, records the death of Captain GILBERT CHARLES RETZ, aged 28. He was born on September 10, 1912, and was educated at Trinity College, Dublin, graduating M.B., B.Ch., B.A.O. in 1937. After holding the post of house-surgeon at Macclesfield General Infirmary he entered the I.M.S. as lieutenant in 1938, being antedated one year. He joined the British Medical Association in 1938.

DEATHS IN THE SERVICES

Wing Commander FRANK PAUL SCHOFIELD, R.A.F. (ret.), lost his life by enemy action in London last month. He received his medical education at St. Bartholomew's Hospital, and qualified M.R.C.S., L.R.C.P. in 1920. Four years later he took the degrees of M.B., B.S. of the University of London. He had held the post of house-physician at St. Bartholomew's. In 1926 he entered the R.A.F. as flight lieutenant, was promoted squadron leader in 1934 and wing commander in 1937, retiring in 1939.

Captain GEORGE WHARTON KENDRICK, late R.A.M.C., died at Cheddar on April 26. He was the son of the late Dr. Kendrick of Bilston, and received his medical education at St. Thomas's Hospital, taking the M.R.C.S., L.R.C.P. in 1932. Entering the R.A.M.C. soon after qualifying, he became captain in 1934. He had recently served in India and was stationed at Benares, but had to leave the Service owing to ill-health.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The Linacre Lecture will be delivered by Sir Walter Langdon-Brown, M.D., F.R.C.P., Emeritus Regius Professor of Physic, on Friday, May 30, at 5.15 p.m., in the lecture room of physiology, St. John's College. The title of the lecture is "From Witchcraft to Chemotherapy."

Applications for the Marmaduke Shield Scholarship in Human Anatomy are to be sent to the Registrary by May 20. The award will be made towards the end of June. The persons eligible are such undergraduates of not more than three years' standing from matriculation, and such Bachelors of Arts of not more than four years' standing from matriculation, as have completed the first examination for medical and surgical degrees and are qualified in anatomy and in physiology to proceed to the Final M.B. Examination, and have also obtained honours in Part I of the Natural Sciences Tripos with anatomy as one of their subjects. Women also are eligible. The scholarship is normally tenable for one year from the date of the award, but a scholar may be re-elected for a second year. The emolument is £100 a year.

UNIVERSITY OF WALES

Nancy G. Rogers has satisfied the examiners in Part II and has qualified for the Diploma in Public Health.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—C. A. Anderson, D. V. Bateman, G. H. Miles.

MEDICINE.—S. Hashim.

FORENSIC MEDICINE.—S. Hashim.

MIDWIFERY.—D. V. Bateman, A. H. Evans, P. R. Green, J. H. C. Hill, R. L. Skea, H. A. Worthy.

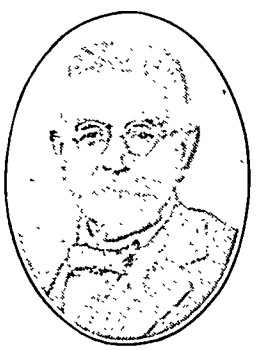
Obituary

JAMES HOGARTH PRINGLE, M.B., F.R.C.S.

Consulting Surgeon, Glasgow Royal Infirmary

By the death of Mr. Hogarth Pringle at his home in Killearn, Stirlingshire, on April 24, Glasgow has lost one of its most notable surgical personalities. For some years Mr. Pringle has been in indifferent health, and was occasionally laid aside, but he seemed courageously to defy illness till the terminal phase. He was in his seventy-eighth year.

Born in Parramatta, New South Wales, the son of G. Hogarth Pringle, M.D., F.R.C.S., he was educated at Sedbergh and Edinburgh University. He graduated in medicine in 1885, and became a member of the Royal College of Surgeons in 1888 and a Fellow in 1892. In the years following graduation he prepared himself for a surgical career by taking house-surgeonships in Edinburgh Royal Infirmary and Glasgow Royal Infirmary, and acting as clinical assistant in the gynaecological ward of the Edinburgh Royal Infirmary and assistant at the Royal London Ophthalmic Hospital. These home appointments were followed by study in Berlin, Vienna, and Hamburg, where he made lifelong friendships with masters of the standing of von Eiselsberg and Lauenstein. He was assistant to Macewen in Glasgow Royal Infirmary, and in 1896 was appointed surgeon to that hospital, retiring under the age limit in 1923. His long period of senior active service of twenty-seven years was recognized by the Board of Managers, who appointed him honorary consulting surgeon. In 1899 he was appointed lecturer in surgery and demonstrator in anatomy to Queen Margaret College, the college in Glasgow for women students before the University classes and the wards of the Royal Infirmary were open to them.



Pringle's interests extended over the whole field of surgery. He was essentially an individual worker, and spent almost the whole of his day in the wards. He was free from ambition to develop a large popular surgical practice. Fractures, at a time when that branch of surgery rather tended to be left to the house-surgeon, were treated entirely by himself, and his great interest in the subject and his mechanical skill in managing fractures are exhibited in a book, *Fractures and their Treatment*, published in 1910. He described original operations for umbilical hernia and inguinal hernia in the *Edinburgh Medical Journal* and in the *British Medical Journal*. A paper on the treatment of empyema was published in this *Journal* in 1905, and one on arrest of hepatic haemorrhage due to trauma in the *Annals of Surgery* in 1908. In 1913 he wrote a paper, published in the *Lancet*, on vein grafting for maintenance of direct arterial circulation: one such case, where a popliteal aneurysm had been removed and the arterial circulation re-established by means of a vein graft, aroused great interest when it was demonstrated to the Glasgow Royal Medico-Chirurgical Society. Other two contributions were also noteworthy: along with the late Prof. Teacher he demonstrated the occurrence of post-mortem digestion of the oesophagus, and at a London meeting of the British Association of Surgeons he described how sight might be saved by a timely operation in cases of haemorrhage into the optic nerve due to injury in the temporo-frontal region of the skull. Up to near the end of his life Pringle continued to follow up his cases, and to write minor papers with the late results of his work. At the time of his death he was actually engaged in working up his notes on some very early experiments on the cadaver to illustrate the mechanism of dislocation of the hip, as he was not convinced of the accuracy of the commonly accepted explanations.

Pringle was an original member of the British Association of Surgeons, and enjoyed his friendships with the members of the Chirurgical Club, founded by Moynihan, Robert Jones, and Stiles. He may be said to have lived for surgery and surgery alone. He was an extraordinarily thorough operator, with delicate manipulative and mechanical skill, and he was, like his master Macewen, a pathologist as well. He had not the gift of fluency in public speech and writing, but he possessed a direct, straight, and fearlessly critical mind, and no lack of fluency in private talk. A certain austerity of manner to strangers was not exhibited to those who had the privilege of his friendship, and members of the profession who turned to him in their illness had frequent occasion to appreciate his essential kindness of heart.

Prof. G. GREY TURNER writes:

Hogarth Pringle deserves to be remembered as one of the most progressive of the British surgeons of his day. As a young man he studied in Germany and Vienna and always kept in touch with the best of the Continental work. At the outset of his career he was associated with Macewen, and as long ago as 1888 he assisted that great man with pathological work in one of the side rooms which had been fitted up as a laboratory in the old Glasgow Royal Infirmary. In the picture which shows Macewen at work in the old theatre there in 1892, Pringle is a prominent figure near the head of the table. His stories of his association with Macewen were very vivid and clearly showed his indebtedness to that great master.

In his own work as surgeon to the Glasgow Royal Infirmary Pringle preserved a very open mind and was always anxious to give his patients the benefit of any new work which he considered worthy of trial. Long before the last war, in cases where he had excised strictures, he transplanted animal urethra to repair the defect and with encouraging success. He also employed arterial suture in some of his cases, using the Carrell technique, and transplanted portions of vein where arteries had been excised and with good results. But he deserves especially to be remembered for his own pioneer work in connexion with the treatment of melanotic sarcoma. As long ago as 1898, when this condition was looked upon as practically beyond surgical aid, he planned and carried out the operation which holds out the best chance of success. There were two cases, and in each there were secondary deposits in the lymph glands. Pringle kept in touch with the patients, and in 1937 in the *Lancet* he was able to report that they were both alive and well 38 and 31 years after his extensive operation. His plan for the control of the hepatic circulation in cases of severe haemorrhage should always be remembered, for this was certainly an original contribution to the management of the more serious abdominal injuries. In many other respects he did excellent work of a high order. His papers were always concise and direct, and he wrote a very good book on fractures.

A rather abrupt manner and a fierce expression sometimes created an unfavourable reaction which was certainly unjustified, for Hogarth Pringle was among the most kind-hearted of men and a delightful travelling companion. But the open sesame to his true friendship was a real interest in surgery unsullied by the slightest hint of sham or unwarranted publicity. Among that inner circle who appreciated his real worth he will indeed be sorely missed.

THOMAS H. W. ALEXANDER, F.R.C.S.ED.

Surgeon, Gray's Hospital, Elgin

We regret to announce the death, which took place on April 29 after an operation at Aberdeen, of Dr. Thomas Hood Wilson Alexander, one of the best-known medical practitioners in the north-east of Scotland. He was aged 63.

A native of Perth, he graduated M.B., Ch.B. at the University of Edinburgh in 1900 and was house-surgeon at the East Suffolk Hospital, Ipswich, before going for postgraduate study to Berlin, where he acted as clinical assistant at the Charité Hospital. He began practice at Elgin nearly forty years ago, and his services as a surgeon were in demand throughout

north-east Scotland and the Hebrides as well. During the last war he served with the rank of Major R.A.M.C.T.R., as surgical specialist and officer in charge of the surgical division of various medical units of the Expeditionary Force, and was present at the Salonika operations. He took the F.R.C.S.Ed. diploma in 1918. At Elgin Dr. Alexander was surgeon to Gray's Hospital, medical referee under the Workmen's Compensation Act for Elgin and Nairn, consulting surgeon to the Stephen Cottage Hospital, Dufftown, and surgical specialist to the Ministry of Pensions Appeal Board. Outside professional duties his interests were varied and he devoted time and thought to public work; he was a J.P. for Morayshire and for some time chairman of the Moray Education Authority. He joined the British Medical Association in 1901, represented his Division in 1914, was a member of the Scottish Committee in 1920–1, and president of the Northern Counties of Scotland Branch 1931–2.

W. M. SCOTT, M.D.

"A." writes:

The *Journal's* notice of W. M. Scott reflected a characteristic of its subject in the modesty with which his accomplishments were set forth. Actually Scott was one of the most experienced bacteriologists in the world as regards the organisms of epidemic diseases, and his help in identifying types of bacteria and in discovering the origin and course of outbreaks was given with the greatest care and friendliness to bacteriologists and others in every part of the country, and to many his first service of this kind was volunteered. The laboratory of the Ministry of Health in which he and Fred Griffith worked was fantastic in discomfort and lack of good equipment, but both of these men overcame the disabilities imposed on them, and the absence of clerical assistance led Scott to write his reports on specimens sent to him in the form of letters which combined instruction with information. The last medical discussion in which I heard him take part—more than a year ago—was on food poisoning by the Salmonella organisms, in the study of which he was one of the foremost in the world. On this occasion he was a guest speaker at the Royal Society of Medicine, and he began his contribution with a sincere apology for the small offering he had to bring. He seemed really distressed by this feeling, and perhaps like some others I wondered whether the upheaval of his work by the war had prevented his making anything but a hasty preparation of material. Admittedly I should have been wiser than to share his diffidence in his work, and he expounded experiments of practical value which would have been for many people the contented occasion of an independent contribution to a journal. His writings in official reports and elsewhere combined accuracy in the latest scientific details with practical use in the detection of epidemics, and similarly his interest in his work merged with his interest in mankind and its morals and its manners. His popularity with his colleagues in this country was buttressed by his acquaintanceship with bacteriologists in many lands and by the important part he took in the International Society for Microbiology and its successive congresses. At his home in Dulwich he and Mrs. Scott and their family gave the liveliest and most generous hospitality to many, and these as well as other readers of the *Journal* deeply regret the loss which his death has caused to his relatives, his friends, and to the work which he was brilliantly executing.

Dr. JOHN L. BUNCH, who died suddenly at Teignmouth on April 22, practised for many years in London, largely as a dermatologist, and had been a member of the British Medical Association for forty-three years. A student of University College, London, he graduated B.Sc.Lond. in 1890 (qualifying for a university scholarship), took the M.B., B.S. in 1893, the M.D. in 1895, and the D.Sc. and M.R.C.P. in 1898. As an undergraduate he won a university exhibition and gold medal in physiology; also the Atchison scholarship and Filliter exhibition in pathology at University College, where he was for a time assistant demonstrator of anatomy after serving as house-physician and house-surgeon at U.C.H. On returning from postgraduate study in Paris and Vienna Dr. Bunch was appointed assistant physician to the German Hospital in London and to the Mount Vernon Hospital. Later he was appointed physician for diseases of the skin at the Queen's Hospital for Children and physician to the Hospital for Diseases of the Skin in Leicester Square. He was a past-president of the London Dermatological Society and wrote the article on pruritus and itching diseases of the skin in Hutchison and Collier's *Index of Treatment*, as well as papers in the *British Journal of Children's Diseases* and the *British Journal of Dermatology and Syphilis*.

The death of Dr. MORGAN JOHN MORGAN of Aberystwyth in his 77th year has caused widespread regret both in the town and in the countryside of North Cardiganshire. A student of Guy's Hospital, he qualified with the L.S.A. and the M.R.C.S., L.R.C.P. in 1889, and ten years later took the D.P.H of the English Royal Colleges and the M.D. of Brussels. As a young man he returned to his native town as house-surgeon to the Aberystwyth Infirmary and Cardiganshire General Hospital; after this he began general practice on his own and did very well, and for nearly fifty years served the neighbourhood faithfully. Dr. Morgan has been well described as a beloved family doctor, upon whom his patients leant heavily in time of trouble. He was for many years honorary surgeon to the Aberystwyth Infirmary, and during the last war was medical officer to the local Red Cross Hospital. He had been a member of the British Medical Association for nearly half a century. Engrossed in his profession, Dr. Morgan found no time for public life, but he took a keen interest in the affairs of the town, where he was such a familiar and respected figure.

Dr. JAMES SALWEY, elder son of the Rev. Geoffrey Salwey, rector of Botley, near Southampton, was injured by enemy action while attending to air-raid casualties with great devotion, and died in hospital soon after admission. He was not yet 25 years of age. Educated at Epsom College and the Middlesex Hospital, he qualified as M.R.C.S., L.R.C.P. last October. He was fond of sailing and other outdoor sports, and had been secretary of the Middlesex Hospital Musical Society.

The following well-known foreign medical men have recently died: Surgeon-General Rear-Admiral WILLIAM CLARENCE BRAISTED, United States Navy, retired, and president of the American Medical Association 1920–1, aged 76; and Senator GIUSEPPE TUSINI, emeritus professor of clinical surgery at Genoa and author of works on echinococcus disease of the liver, actinomycosis of the foot, and cysts and tumours of the pancreas.

Medical Notes in Parliament

Employment of Alien Doctors

Answering Colonel Arthur Evans on April 30, Miss HORSBRUGH said she did not know how many friendly and allied alien doctors with special qualifications were still unemployed or how many Czechs with medical degrees in their own country were studying for English degrees, or whether there was a surplus of Army doctors with the Czech Army. Colonel EVANS asserted that special scholarships had to be granted to enable these alien doctors to study. He asked Miss Horsbrugh to take steps to absorb all unemployed doctors, irrespective of nationality, and to permit alien doctors already qualified in their own country to practise without taking English degrees.

Miss HORSBRUGH replied that the Medical Practitioners (Temporary Registration) Order, 1941, provided a wide field of employment for American and Allied alien doctors and refugee doctors of enemy nationality in hospitals and other approved institutions without the necessity for obtaining British medical qualifications. Their absorption into this service was proceeding steadily. Linguistic and other difficulties made it inadvisable to allow these doctors to engage in domiciliary practice.

Sir HENRY MORRIS-JONES said there was a breakdown in the employment of friendly Allied and alien doctors. In this country there were 700 such doctors, yet 1,000 doctors were asked from the United States. Miss HORSBRUGH gave an

assurance that all alien doctors would be used in hospitals and institutions. She added that the general scheme for reorganization of medical practitioners was going on. Sir Henry Morris-Jones said he would raise the matter again.

Mr. ERNEST BROWN told Miss Rathbone on May 1 that he would not defer arrangements for bringing over American doctors to this country until the medical service had absorbed other fully qualified foreign doctors now here. He said the American doctors were needed mainly for service with the Forces, while alien doctors of the European nationalities covered by the Medical Practitioners (Temporary Registration) Order, 1941, were needed mainly for employment in civil hospitals and institutions. The employment of the two classes could therefore proceed concurrently. At the moment 100 alien doctors had been found employment and notified to the General Medical Council for registration. Another 150 were under consideration for employment. The Government required all the doctors it could get. Sir FRANCIS FREMANTLE asked whether Mr. Brown was convinced that the Central Medical War Committee was doing all it could to get these people employed.

Mr. G. STRAUSS asked that friendly alien doctors in the Pioneer Corps should be given medical work and that the British Medical Association should not be allowed to stand in the way of their employment.

Mr. BROWN said these doctors would certainly be given a chance. He was not aware that the British Medical Association had any intention of standing in the way. The Central Medical War Committee was doing its best in this matter and had the hearty co-operation of the British Medical Association. Sir FRANCIS FREMANTLE remarked that the British Medical Association had nothing to do with this matter.

Feeding the Nation

Introducing, on April 30, an Estimate for the Ministry of Food, Major LLOYD GEORGE said that in 156 towns 299 communal restaurants had been approved in addition to 170 London meals centres operated by the L.C.C. and 280 evacuee centres now operated as British restaurants open to the general public. During the last year the consumption of liquid milk rose by 14%. That demand could not be met in winter, and the Central Milk Distribution Committee had been asked to ensure a saving of 15% in consumption of milk. There would not, however, be any cuts in the milk supplies to people who took one pint or less per day. Dairymen had been instructed to respect needs of illness. This scheme did not affect the national priority classes such as schools, hospitals, and persons suffering from certain illnesses.

Sir ERNEST GRAHAM-LITTLE said a most important question was provision of bread which contained the wheat germ and the salts of the wheat germ. The fortified loaf, which had been discussed in the Food Estimates debate of July, 1940, was now much discredited. Milk, vegetables, and fruit, the staple sources of vitamins and salts necessary for nutrition, were difficult for the poorer classes to obtain. Bread would be the principal source of vitamins for the population generally. That the reinforced loaf was a proper substitute for the wholewheat loaf was a mistaken proposition. All that was proposed to do with the reinforced loaf was to add an inadequate quantity of vitamin B. In 1918 a Committee of the Royal Society had pronounced absolutely in favour of the wholemeal loaf.

Diabetics' Rations.—In reply to a question by Sir Ian Fraser on April 22 Major LLOYD GEORGE said that on the recommendation of the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council, an independent body of medical experts by whom Lord Woolton was guided, he had arranged for diabetics to receive two extra meat and two extra butter and margarine rations a week in place of their sugar ration. Lord Woolton understood that these extra allowances enabled persons suffering from diabetes mellitus to obtain an adequate diet, and under the present food restrictions no other special arrangements needed to be made

Rations during Pregnancy.—Dr. HOWITT suggested on April 30 that the Ministry of Food should grant an extra half-ration of butter and an extra half-ration of sugar to all pregnant women for the last six months of pregnancy and for six months after delivery if the mother nursed her child. Major LLOYD GEORGE said the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council advised that no extra allowances of any rationed food were necessary for expectant mothers. As soon as a birth was notified a child's ration book was issued by the local food office, the rations being intended for the use of the mother.

Notes in Brief.

Many stamped national health insurance cards have been lost or destroyed by enemy action. All approved societies and local authorities have been specially advised of simplified procedure to be followed in reporting such loss or destruction to the Central Department, so that credit may be allowed for the missing stamps with the utmost speed.

To mitigate the danger of infection Mr. Brown has decided that not more than forty-eight children shall be accommodated in each dormitory of the national camps.

Mr. E. Brown told Mr. Viant on April 8 that six cases of post-vaccinal encephalitis came to the notice of the Ministry of Health during 1939, of which three were in soldiers.

The Minister of Food has under consideration the special need of young children for such foods as eggs and fruit.

The number of deaths from cancer in England and Wales registered during 1939 is provisionally returned as 69,001.

Medical News

The one hundred and fifth annual general meeting of the Royal Medical Benevolent Fund will be held at the Royal Society of Medicine, 1, Wimpole Street, W., on Wednesday, May 14, at 12 noon, with the president, Sir Thomas Barlow, in the chair.

The next meeting of the Association of Industrial Medical Officers will be held at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C., on Saturday, May 17. At 2 p.m. there will be private business, and at 2.30 p.m. a discussion on "The Employment of Women in Industry," to be opened by Dr. M. L. Dobbie-Bateman, Miss F. I. Taylor, Dr. L. S. Swanston, and Dr. Graves Peirce.

The Glasgow Branch of the Chartered Society of Massage and Medical Gymnastics will hold an extraordinary general meeting in the Hall of the Scottish Nurses' Club, 203, Bath Street, Glasgow, on Thursday, May 15, at 7 p.m., for a discussion on "Occupational Therapy in Relation to Physical Therapy," with special reference to re-education after injury. The discussion will be opened by Dr. Anna Broman, medical physiotherapist; Miss Amy de Brisnay, occupational therapist; Mr. James Patrick, F.R.C.S.Eng., surgeon in charge of the Rehabilitation Department, Glasgow Royal Infirmary; and Mr. G. H. Stevenson, F.R.C.S.Ed., surgeon, Glasgow Royal Infirmary. A cordial invitation is extended to members of the medical profession to attend and take part in the discussion. Those desirous of contributing are asked to communicate with the honorary secretary, Miss Elizabeth A. Watson, C.S.M.M.G., 9, Berkeley Terrace, Glasgow, C.3.

The B.B.C. announces a broadcast talk to schools on Thursday, May 15, at 2.40 p.m., on Sir Ronald Ross's work in the conquest of tropical disease; also two talks in a new series on science and the fighting man: on May 13, "The Unseen Enemy: Modern Methods of Fighting Germs in War," and on May 20, "Blood in Bottles: How Modern Methods of Blood Storage and Blood Transfusion are Saving Life," both at 3.30 p.m.

Lieut.-General A. G. L. McNaughton, General Officer Commanding 1st Canadian Corps Overseas Force, and president of the National Research Council of Canada, will read a paper entitled "Research in Canada" on Tuesday, May 13, at 2.30 p.m., at the Institution of Electrical Engineers, Victoria Embankment, W.C.

In 1939 Argentine had 11,807 doctors, and 426 hospitals, of which 42 were national, 114 municipal, 50 provincial, 187 owned by welfare organizations, and 16 belonged to foreign colonies. There were 47,371 beds for general diseases and 23,668 for special diseases. In Buenos Aires there were 5,391 doctors and 37 hospitals.

The Board of Trade has issued an open Licence (S.R. and O., 1941, No. 554) authorizing any person registered under the Limitation of Supplies Order in Class 1 to supply without limitation as from the date of the licence, April 22, 1941, abdominal belts specially designed for post-operative use, the following: (1) suprapubic drainage belts, (2) colotomy belts, (3) belts for appendicectomy, (4) belts for nephrectomy.

The following committee have been appointed for four years to advise the Government of the Union of South Africa concerning leprosy research and other matters relating to leprosy in the Union: Dr. P. Allen, Secretary for Public Health and Chief Health Officer for the Union; Dr. E. H. Cluver, Director of the South African Institute for Medical Research; Prof. W. F. Rhodes, Capetown; Prof. W. H. Crain, Johannesburg; Dr. A. Pijper, Dr. A. J. Orenstein, and Dr. K. Bremer, M.P.

Vitamins, vitamin concentrates, and vitaminized oils are regarded as put up for medicinal use and as chargeable with Purchase Tax when they are put up for use by injection, but not otherwise.

Dr. Alfred Blacklock, professor of surgery at Vermont, has been appointed to the chair of surgery at the Johns Hopkins University. He is the third incumbent of the chair, the first being the late Dr. William S. Halstead, who was succeeded by Dr. Dean Lewis.

The Robert Jones Medal and British Orthopaedic Association Prize for 1940 have not been awarded.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The returns for the week under review show that there was a substantial decline in the incidence of all infectious diseases with the exception of enteric fever. The number of cases of scarlet fever was the lowest for forty weeks, and of diphtheria for the past thirty-two weeks. The decline in the number of notifications of measles was general, but there was one notable exception: 97 cases were reported during the week in Corby U.D., Northampton; this area had no cases of measles during the three preceding weeks. Whooping-cough, which had an increasing incidence during the past three weeks, declined by 1,030 cases. In Scotland, where the returns for whooping-cough have been dominated by the epidemic in Glasgow, the cases were one-half of those recorded a fortnight before.

Dysentery

The outbreak in the district of Hemel Hempstead, Herts, has begun to subside: 25 cases were notified as compared with 79 in the previous week. The infection has been reported from the adjacent districts of Berkhamsted and Watford, where 20 and 5 cases respectively were notified. Cases were reported in several fresh districts, the chief of the new outbreaks being in Berkshire, Hungerford R.D. 5; Cornwall, Bodmin M.B. 6; Surrey, Banstead U.D. 5; Lancashire, Liverpool C.B. 6. An increase occurred in London, where the cases rose from 5 to 15. Chelsea with 8 and Wandsworth with 4 cases were the boroughs responsible for the rise.

Quarterly Returns of the Registrar-General

The quarterly returns of the Registrar-General for England and Wales, covering the fourth quarter of 1940, include a provisional summary for the year. The death rate for 1940 was 14.3 per 1,000. This was 2.2 above that for 1939 and reverts to the mortality level of two decades ago. Two-thirds of the increase in deaths occurred in the first quarter, when weather conditions were very severe and there was a considerable amount of influenza. The birth rate of 14.6 per 1,000 was 0.3 below the figures for 1939. Infant mortality was 55 per 1,000 live births, and was 5 above that for 1939 and 2 above that for 1938, but was lower than in any year before 1938. Stillbirths were 36 per 1,000 total births, and the number recorded, 22,648, was the lowest on record. The marriage rate for 1940 was 22.6 per 1,000, and was the highest on record.

No. 15

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended April 12.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	1941 (b)	1941 (c)	1941 (d)	1941 (e)	1940 (Corresponding Week) (a)	1940 (Corresponding Week) (b)	1940 (Corresponding Week) (c)	1940 (Corresponding Week) (d)	1940 (Corresponding Week) (e)
Cerebrospinal fever ..	282	12	54	6	12	411	29	84	3	5
Deaths ..	2		4				6	5		
Diphtheria ..	883	49	215	19	29	693	29	229	41	39
Deaths ..	31	—	5	—	2	25	—	3	—	2
Dysentery ..	144	15	30	2	—	51	—	45		—
Deaths ..					—			—	—	—
Encephalitis lethargica, acute	3	—	—	—	—	4	1	1	—	—
Deaths ..		—					1	—		
Enteric (typhoid and paratyphoid) fever	26	2	28	4	5	21	1	21	6	3
Deaths ..	—	—	1	1	—	—	—	1	—	—
Erysipelas ..			45	5	4			60	6	5
Deaths ..							—	—		
Infective enteritis or diarrhœa under 2 years										
Deaths ..	30	1	9	9	5	26	4	5	6	7
Measles ..	13,030	355	136		5	3,592	45	104		142
Deaths ..	19	—	—	—		3	—	—	—	5
Ophthalmia neonatorum ..	68	5	37		1	84	5	21		—
Deaths ..										
Pneumonia, influenzal*	944	39	14	6	13	373	72	9	4	12
Deaths (from influenza) ..	53	2	5	—	1	72	10	5	7	1
Pneumonia, primary ..		—	305	12				205	11	
Deaths ..		38		13	12		55		16	12
Polio-encephalitis, acute ..	1	—				2	—			
Deaths ..		—					—			
Poliomyelitis, acute ..	4	—	4	1	—	4	—	1	—	1
Deaths ..		—	—				—	—		
Puerperal fever ..	1	1	11	1	—	2	2	3	2	—
Deaths ..		—					—			
Puerperal pyrexia ..	123	6	23		—	165	13	32		1
Deaths ..										
Relapsing fever ..	—	—			—	1	—			—
Deaths ..										
Scarlet fever ..	1,023	55	139	24	24	1,846	40	117	51	74
Deaths ..	2		—	—		1	—	1	—	—
Small-pox ..	—	—	—		—	—	—	—		—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Typhus fever ..	—	—	—	—	—	—	—	—	—	—
Deaths ..			—	—				—	—	—
Whooping-cough ..	3,592	89	435	—	11	603	6	45	5	15
Deaths ..	39	2	21			1	—	2		—
Deaths (0–1 year) ..	350	23	107	44	16	359	47	65	30	39
Infant mortality rate (per 1,000 live births) ..										
Deaths (excluding stillbirths) ..	5,495	644	1,069	219	173	5,252	554	1,179	217	178
Annual death rate (per 1,000 persons living) ..			17.6	14.5	15.6			13.0	14.5	15.9
Live births ..	4,300	342	1,031	274	224	5,293	1,011	1,934	353	287
Annual rate per 1,000 persons living ..			16.4	18.5	19.6			18.9	23.7	24.2
Stillbirths ..	211	20	41			272	33	42		
Rate per 1,000 total births (including stillborn) ..			43					43		

* Includes primary forms as figures for England and Wales, London (administrative county), and Northern Ireland.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Potassium Content in Schistosomiasis

Dr. F. GORDON CAWSTON (Durban) writes: Is it possible that persons living in districts infested with schistosomiasis possess a lower proportion of potassium than is common in Great Britain, or might it be that the presence of the adult worms interferes with the potassium content of the host's tissues? There would seem to be some such explanation needed to account for the preference in the Tropics of the potassium salt to its sodium equivalent, for those whose study of therapeutics is largely confined to cool climates regard the sodium as being less toxic.

Intermittent Polyuria

DR. ALEXANDER FRANCIS (London) writes: "G. A. G. S.'s" intermittent polyuria (April 26, p. 658) is almost certainly a manifestation of vasomotor instability, and is comparable with an attack of asthma. A too-active blood supply to a particular part may produce symptoms in the area, and so we get asthma, hay fever, polyuria, colitis, etc., according to the region affected. I have proved that these troubles can be overcome by stabilizing the flow of blood throughout the system. "G. A. G. S." would obtain marked relief from the simple remedy of rubbing the surface of the body for five minutes night and morning. This has more effect than any amount of exercise or "physical jerks."

Ulcer of the Mouth

DR. E. U. MACWILLIAM (Bexley, Kent) writes: The following case note may be of interest to others; any suggestions as to aetiology of the condition described would be welcomed by me. Female, aged 58, retired secondary school teacher, valvular disease of the heart following three attacks of rheumatic fever about twenty years ago; severe congestive failure since September, 1939. In June, 1940, an ulcer appeared on the right side of the tongue, followed by two others, one on the left edge of the tongue and the others on the inside of the left cheek. These two latter did not develop much. The primary ulcer steadily progressed. At a fairly early stage it suggested a gumma; later it became a sloughing mass. More than half of the tongue had been destroyed, and the destructive process extended into the floor of the mouth. Three very severe haemorrhages took place, in two of which the patient appeared to be on the point of death. By way of treatment novarsphenamine was given intravenously (although the Wassermann reaction was negative); iodine, acriflavine, sulphanilamide powder, etc., were applied locally; and various mouth-washes were used. None of these had any beneficial effect. Finally I gave the following rather old-fashioned mouth-wash, and the whole thing, except for the loss of tissue, cleared up as if by magic: ℞ Pot. chlor. 3j, acid. hydrochlor. fort. 3ss; let the acid act on chlorate for three minutes, then gradually, with shaking, aq. ad 3vj. It was not possible to have pathological investigations.

Income Tax

Repayment of Borrowed Money

"LAMBDA" obtained certain advances to enable him to complete his studies. He is now in the R.A.F., and is repaying the loans in monthly amounts. Can he claim any allowance against the assessments on his pay?

*** The repayments are of a capital nature, and no allowance can be claimed for income-tax purposes. An allowance can, however, be claimed in respect of the amount of *interest* paid to the bank in each financial year—ending April 5. The bank will supply a certificate of the amount on application, and the certificate should be sent in to the Assessor's Department of the R.A.F. asking for an allowance to be set off against the tax assessed on pay.

Demolition of House and Contents

"BOMBED" inquires to what extent the loss of house, clinic, and contents can be claimed for income tax purposes.

*** The loss as such is not an allowable deduction, but the cost of replacing professional equipment (but not the premises) can be deducted to the extent to which it is not covered by insurance or other claims to indemnity.

LETTERS, NOTES, ETC.

Blood Pressure and Peptic Ulcer

DR. E. SAKOSCHANSKY (Southampton) writes: I have read with great interest the article on digestive disorders in the Forces by Lieut.-Colonel J. Gibson Graham and Captain J. D. Olav Kerr (March 29, p. 473). They suggest that the quickening tempo of modern life is related to the increasing occurrence of the dyspepsias, especially peptic ulceration. In connexion with that statement it occurred to me that it would be interesting to see what the level of the blood pressure was in cases of peptic ulceration. I have been struck on a number of occasions by the low blood pressure in cases of peptic ulceration. This low blood pressure would account for the mental instability, fatigability, and asthenia of many of the cases of gastric ulcer, and would account for Colonel Graham's statement that the severe physical strain and irregular meals before evacuation—from France—had an adverse effect. I think this blood-pressure reading is often helpful in distinguishing between "gastritis" cases (such as, for example, those due to the upset caused by air raids) and organic cases. And it may be added that this low blood-pressure reading had been noted in cases of gastric carcinoma (Thiele, W., *Epitome*, June 4, 1938, p. 458).

Primitive "Closed Plaster" Treatment

DR. ERNEST CULPIN writes from Brisbane: One characteristic of the medical profession appears to be the jealously guarded right of recognition of those who have been the first to introduce any particular method of medical diagnosis or treatment. With respect to the "closed-plaster treatment of wounds" I desire to bring forward the claims of my old friend "Binghi." It is thirty-five years since I had the privilege of observing this time-honoured method of treatment of badly lacerated and infected wounds by "Binghi" when in North Queensland. "Binghi's" technique was simply to cover the wound with a thick coating of mud, which rapidly dried, and to leave it alone. Results as to the healing of the wound were excellent, but in the case of fractures of long bones, of which I saw only one, although union was sound deformity was pronounced. The Australian aborigine—that is, "Binghi"—has apparently been using this "closed-plaster treatment of wounds" for centuries with excellent results. Incidentally, before contamination with the white and yellow races "Binghi" was far superior to European races in respect to public and private morality, and although it had developed in a very divergent direction his intelligence was of a superior order.

Students and the Planning Commission

MR. PETER F. KENNISH writes: I am a student of a London hospital and I wish to express my views on Mr. H. S. Souttar's letter (April 12, p. 569). He makes two points: (1) That members of the Medical Planning Commission are representative. Medical students are not represented and have never been consulted in the matter; the ages of the youngest members of the Commission indicate that they qualified at least twenty years ago and are therefore out of touch with my generation. (2) That there are eleven members "under 45" and that in political life this is considered young. This Commission is concerned with the medical profession, not with politics; few people are grateful for the pass to which the country has been brought by our political "youngsters." Students and men recently qualified are those who will be most deeply affected by the results of the Commission's work. They are keenly interested in the future of their profession, but evince little enthusiasm at the prospect of its being planned by a group of people with whom they have no contact. I suggest that the medical schools have a right to be represented by at least one student or recently qualified man. Lack of experience would be more than adequately balanced by a fresh mind and a less crystallized outlook.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY MAY 10 1941

MEDICAL ATTENDANCE ON AIRMEN AND AIRWOMEN ON LEAVE

The Air Ministry has added a new paragraph to Order No A 828, which was published in the *Supplement* of February 22, page 21. The Order now reads as follows:

1. In accordance with para. 1400 of K.R. and A.C.I. and the instructions on the reverse of Form 295, it is incumbent on all airmen who fall sick while on leave to report if practicable to the nearest naval, military, or Air Force medical establishment or to a civil hospital included under the Emergency Medical or Hospital Schemes of England and Wales, Scotland, or Northern Ireland, showing their passes.

2. Personnel residing more than two miles from a Service medical establishment and unable, owing to their condition, to visit an Emergency Medical Service Civil Hospital although this is within two miles may make application to a civilian medical practitioner, to whom the instructions on the reverse of Form 295 will be shown, and will immediately inform their unit of any such application.

3. If personnel apply to a civilian medical practitioner when it is practicable to apply to the medical officer of a Service medical establishment or to attend at an Emergency Medical Service Civil Hospital, they will render themselves liable for such expenses as may be incurred.

4. To enable personnel to obtain the name and address of the appropriate Emergency Medical Service Civil Hospital nearest to their place of residence while on leave, arrangements have been made for this information to be obtained on request from officers in charge of local air-raid posts.

4A. Claims for payment rendered by a civilian medical practitioner in respect of medical attendance or treatment afforded to personnel on leave will be accepted as charges against public funds unless it has been clearly established, after investigation by the unit concerned, that payment is the liability of the individual, when he or she will be so informed.

5. The provisions of this Order apply also to airwomen.

The Air Ministry also states that a certain amount of difficulty is being experienced by the Air Force authorities in connexion with medical certificates granted in respect of airmen and airwomen by medical practitioners who are called in to attend them when they fall ill on leave. It is essential for medical practitioners to certify on these occasions that the individual is fit or unfit to travel. This is required because if they are fit to travel it is necessary for airmen or airwomen to return to their units or to attend a Service hospital to receive treatment there. Failure to record this information on the certificate involves a considerable amount of correspondence between the Air Force authorities and the medical practitioners concerned, and valuable time would be saved on both sides if certificates were invariably to be made out in accordance with the instructions which are fully explained on the back of each airman's and airwoman's leave pass.

PAY OF CIVILIAN MEDICAL PRACTITIONERS

The War Office has now announced certain alterations in the rates of pay for civilian medical practitioners engaged by the Army. The letter issued to commanding officers is as follows:

"I am commanded by the Army Council to inform you that they have had under consideration the remuneration of certain civilian medical practitioners employed whole-time or part-time and paid under the terms of War Office circular letters of September 5, 1939, and February 8, 1940, No. 24 General/62 (F.2.d). Whenever possible civilian medical practitioners so employed should use drugs and dressings provided by the public, but, where this is not practicable, the Council authorize the increase of the appropriate whole- or part-time rate payable under War Office letter of September 5, 1939, by a sum assessed on the basis of approximately 1s. a day for each 120 persons under his care.

The Council have also decided to increase with effect from October 1, 1940, the pay of civilian medical practitioners employed on a capitation basis under Article 290 Pay Warrant to the following rates:

If there are less than 10 persons	£6 17s. a year
If there are 10 persons or more, for every complete 25 or portion of 25, provided that the total emoluments for all services, exclusive of the examination of recruits and reservists, shall not in any instance exceed £1 10s. for any one day	£13 14s. a year

The maximum daily payment for all services will be increased to £2.

DOCTORS AND FIRE PREVENTION DUTIES

The Civil Defence Duties (Compulsory Enrolment) Order, 1941, gives local authorities power to enrol local residents for compulsory fire prevention duties in the area. As a result of representations made by the British Medical Association the Ministry of Home Security has promised to take steps to exempt medical practitioners from registration and enrolment under this Order.

The Fire Prevention (Business Premises) Order, 1941, compels occupiers of business premises to make arrangements for fire prevention duties, but it is expressly stated that this Order does not apply to "any premises occupied by any person partly as his dwelling house and partly for the purposes of his business, trade, or profession." This proviso automatically excludes from liability under the Order medical practitioners whose surgeries are at their place of residence. A practitioner who has a lock-up surgery or lives away from his surgery must make arrangements for the protection of the premises. He may employ someone to undertake fire prevention duties, or, if this is not possible, he may apply to the local authority for a watcher from the local pool.

Medical practitioners who are employed by a local authority or by a hospital management are not exempt from the Fire Prevention (Business Premises) Order, 1941, when this Order is applied to their area by the Regional Commissioner. All male persons employed on the premises are liable to take their turn in the rotas of duty. Exemption is granted under the Order to persons working a sixty-hour week or longer on vital work, and exemption may be applied for to the appropriate authority on behalf of persons engaged outside their normal working hours in other branches of the A.R.P. organization. If a medical practitioner employed by a local authority or in a hospital is liable to be called upon at any hour to attend to air-raid casualties it may be unreasonable to expect him to undertake fire prevention duties as well. The position of the individual practitioner concerned would have to be taken into consideration, and it is suggested that where a practitioner is already liable to undertake additional medical work outside his usual working hours in connexion with air raids his employing authority should be asked to approach the appropriate authority with a view to releasing him from fire prevention duties.

G.M.C. FINANCES

The number of £5 registration fees paid to the General Medical Council during 1940 showed a sharp reduction on that for the previous year. In England it fell from 1,435 in 1939 to 1,330 in 1940; in Scotland from 692 to 670; and in Ireland from 362 to 315. The biggest fall was in the number of colonial and foreign practitioners, of whom 483 paid the £5 registration fee in 1939 and only fifty-two in 1940. The total reduction in income from registration fees amounts to £3,356. As against this and other reductions in receipts, the expenditure of the Council is down by some £1,600, largely due to the compression of the summer session into two days and of the winter session into three. The fees and expenses of members of the Council are only two-thirds of what they were the year before, which itself was an economical year. The Council, by reason of the number of its members and the fact that they come from all parts of the British Isles, is commonly said to be the most expensive of disciplinary bodies. A day's session in fees alone works out at just under £200, and in addition there are hotel and travelling allowances. The Council, however, is in an excellent financial position. The surplus in the hands of the English Branch Council amounts to over £63,000, and of the Scottish Branch Council to nearly £23,800.

WAR DAMAGE ACT

The Medical Insurance Agency states that it has now been decided by the authorities that the principle of average will not be applied to insurances under the (voluntary) chattels sections of the War Damage Act. It follows that there is no compulsion to insure for the full value of goods of this type, though doubtless it is wise that this should be done.

Correspondence

State Medical Service

SIR,—The correspondence in the *Journal* appears now to be concentrated on the work of the Medical Planning Commission rather than, as at first, on its personnel. And the salient feature of this later phase is, without doubt, the question of a State Medical Service. What is the attitude of the public? In my opinion the public will follow its leaders in this matter, and its leaders of one political party will introduce such a service at the earliest available opportunity, provided there is no evidence of strong and united professional opinion against it, and the other political party will also introduce it, though less wholeheartedly, if there are indications of a large professional opinion in its favour. The crucial question therefore is, What does the medical profession want? Up to now the advocates of a whole-time service in your correspondence seem to have had the best of it; but are they merely the more vocal? Do they represent the mass of the profession, notoriously inarticulate until a crisis arises?

For some years past I, as others, have been convinced that there is a strong and growing opinion, especially among our younger colleagues, in favour of a whole-time service. Private talks, impromptu discussions at meetings, letters from various correspondents have all given me this impression. Moreover, whatever their own opinion for or against, practically all with whom I have spoken are agreed that, whether we like it or not, such a service is inevitable. And this view has been gathering strength quietly, almost imperceptibly, during the last few years. It has required the war to accelerate this process, and the appointment of the Planning Commission to bring the question right into the open.

But much if not all of this is merely presumption, not based on any concrete evidence. I have been very anxious to secure such, and recently have carried out a small experiment of my own. I sent a short circular letter to every medical practitioner in my own county of Derbyshire, with the exception of the Service members, with whom, at that time, I was unable to get into touch, asking what their reactions would be to a proposal for a State Medical Service, such, for example, as that outlined by Dr. Pybus in the *Supplement* of March 15.

The results of the inquiry up to date (answers still coming in) are as follows:

Practice	For		Against	
Consultants and Specialists	11		2	
Public Health Service	22		2	
Hospital Residents	2	121	1	72
General Practitioners	86		66	
Unclassified	—		1	

Age Group	For		Against	
25–35	21		11	
35–45	54		20	
45–55	29	121	23	72
Above 55	17		17	
Unclassified	—		1	

The inquiry was limited to one county, the most populous part of which is dominated by contract practice. The result in another type of county might well be reversed. On the other hand, I suggest that my inquiry among Service members, when completed, may still further emphasize the verdict. All that can be claimed is that the figures provide prima facie evidence that the question of a State Medical Service should not only be a major issue for discussion by the Commission but that *it should receive priority over all other questions.* For it is impossible to plan rationally or build safely until the foundations on which the structure is to be erected have been decided upon and made secure.—I am, etc.,

Ashover, April 14. H. W. POOLER.

SIR,—I should like to make a few comments on Dr. Alan Marsh's alternative scheme (*Supplement*, April 19, p. 47). In the last few years the tendency to divide medicine into completely separate branches has been too freely indulged in, with the result that we now have overlapping in some cases and incoordination in others. To get the best we must have much closer bonds between general and consultant practice; they are not separate entities but component parts of medicine.

I cannot agree that a State service giving free treatment to those with incomes below £250 a year and reduced fees for those with under £500 a year is more likely to produce further schism in the profession than Dr. Marsh's suggestion of a glorified club practice. If complete equality is desired then I would suggest a free State service for all.

A fixed salary might destroy initiative and ambition, but in my scheme those with initiative and ambition are catered for, since without these qualities there would be no hope of attaining the higher posts in the Service. There would, however, be little opportunity for the "perfect bedside manner" or the fashionable society man who now reaps rich harvest "telling the tale" to rich dowagers—yes, even so to old men and maidens for that matter!

Stage 1 of Dr. Marsh's scheme is simply a glorified "club" practice, and as such is a retrograde step. We would revive local medical-aid societies and place ourselves under their dictatorial control. In Stage 2 the local medical officer of health takes a hand in our control. When Stage 3 is arrived at we start to form clinics at the local authorities' instigation; where the local authority is progressive, clinics would grow, but in non-progressive or depressed areas the clinics would remain castles in the air. Therefore, why not adopt a scheme in which the formation of first-class clinics in every area is the first step rather than one which provides them sometime or never? In Stage 4 both schemes run practically parallel, the only difference being that in my scheme this stage is arrived at by a shorter route.

Regarding finance, would it not be simpler for the State to be responsible for the upkeep of all the hospitals, for the salaries of the hospital staffs and the salaries of the medical staffs of the clinics, and for the local authorities to provide for the upkeep of the clinics? If any assistance to finance the scheme is required I would suggest those with incomes of over £500 a year paying for attention received rather than making a compulsory levy on the poorer classes. This would certainly make both classes feel more at ease under the new system.

The idea of increasing the value of practices is only further commercializing medicine, an evil already too great; after all medicine is an art, and art and commerce do not run well in double harness. In my scheme postgraduate study, holidays,

and pension are all adequately provided for, but Dr. Marsh leaves them all in their present neglected state. In any new scheme these are of paramount importance. Again, in his alternative scheme we should be under three masters—the local medical-aid society, the medical officer of health, and the Ministry of Health, but under my scheme we should have only one master—the central body, with at least 50% medical men in it, directly under the Ministry of Health—and it has been taught for nineteen hundred years that no man can serve two masters, so how would he succeed with three?

Finally, M.O.H.s, R.M.O.s, Colonial Medical Service M.O.s, and so on are all, to all intents and purposes, under State control, yet even so they manage to carry out their medical duties very efficiently and not fare too badly, so why should we dread the evil day so much? Our greatest danger is not State control but the bogy it conjures up in our imagination and the lack of unity in our ranks. We must hope that the Medical Planning Commission will succeed in formulating a scheme acceptable to profession, Government, and patient, and then that the profession will unite together when that scheme is put before Parliament so that we can show confidence in our scheme and by our unity ensure its adoption.—I am, etc.,

Wetherby, April 23. S. TERRY PYBUS, M.D.

SIR,—In the past faith has been an attribute of the Church, while the medical profession endeavoured to maintain an attitude of scientific detachment. Now, however, we seem to be showing a touching faith in the magic words "State service" and "clinic," and are closing our eyes to the examples already before us.

Your correspondents write of the wonderfully equipped "clinics" in which we shall work, the generous salaries we shall be paid, and the great benefits our patients will receive when we are a happy band of brothers working a State medical service under the benevolent and fatherly eye of the Ministry of Health. But do existing State services support this faith? The wonderful equipment of most infant welfare clinics appears to be a large bundle of "forms," one rather bent probe, and a bottle of hyd. c cretae tablets, while the clinic building is commonly a draughty church hall. As to salaries, this is an essentially "G.P." service, and the level of remuneration will serve as an index to the Governmental views on this subject.

The money value attached to consultant practice is shown by the E.M.S., where a man of established consultant status is paid £900 per annum for full-time service, while I have yet to hear any member of that service praise the equipment. This is wartime, when no member of a State Department ever thinks in units of less than £1,000,000. Can we expect an impoverished country after the war to do better?

It is true that on paper a State medical service can look very attractive, but I am afraid that in actual operation it would be very different. Let us not be mesmerized by words and so led into a situation worse than the present one.—I am, etc.,

Whetstone, N.20, April 26. A. C. ELKIN.

Public Health Appointments in Wartime

SIR,—The letters of "Midland M.O.H." and "S. L." (*Supplement*, April 5, p. 42, and April 26, p. 50), while stating two opposing points of view quite clearly, both fail to look at the problem concretely.

"Midland M.O.H." goes to the root of the matter when he says that a temporary appointment as medical officer of health will not attract the best men for the post, and at the present time it is more than ever essential that a medical officer of health should be both competent and energetic. Furthermore, if such a temporary appointment were filled by a thoroughly sound man, that man would probably hold an advantage over other candidates when the permanent appointment was made after the war, in which case the temporary nature of the first one would not have achieved the desired end. "S. L.," however, is quite right in his contention that members of the Services are as likely as civilian medical officers to be penalized by the age limit. This, however, will occur whether wartime appointments are permanent or not.

What appears to have been overlooked is that appointments as M.O.H., as distinct from posts as assistant M.O.H., are rarely given to men under 35 years of age, and few men of that age in the Public Health Service are likely to be called up for service with the Forces unless the war takes on a much more active form, in which case we shall be very much nearer to peace than we are at present.

The desirable policy would seem to be more or less as follows. Posts as assistant or deputy M.O.H., for which the younger men will apply, should be temporary. There will always be a good supply of vacancies of this kind in peacetime, so that at the close of the war the young man would still be able to find a place without undue difficulty. Posts as M.O.H. should be left to the local authorities' discretion, but no pressure should be brought to bear on them to make the appointments temporary. Last, and most important, the age limit of 45 should be abolished. It was imposed largely because of superannuation difficulties in the days when some authorities had such schemes and others had not, and it has been obsolete since superannuation schemes became compulsory. Some men are too old at 40, while others have their best years still to come at 50. Surely the upper age limit should, within reason, be as elastic as the lower.

Perhaps I might add, as disclaimer, that I am a comparatively young M.O.H. who will be none the worse for a period of "ripening" in my present post.—I am, etc.,

April 26. "NORTHERN M.O.H."

B.M.A.: Branch and Division Meetings to be Held

WILTSHIRE BRANCH: SWINDON DIVISION.—At Victoria Hospital, Swindon, Wednesday, May 14. Annual meeting. Election of officers, etc.

B.M.A. LIBRARY

The following books were added to the library during February and March, 1941.

Anthony, S.: The Child's Discovery of Death: A Study in Child Psychology. 1940.
Bailey, H., and Love, R. J. McN.: Short Practice of Surgery. Fifth edition. 1941.
Browning, E.: Modern Drugs in General Practice. 1940.
Castle, W. E.: Mammalian Genetics. 1940.
Chambers, E. G.: Statistical Calculation for Beginners. 1940.
Collier, H. E.: Outlines of Industrial Medical Practice. 1940.
Davidson, M.: Practical Manual of Diseases of the Chest. Second edition. 1941.
Dilling, W. J.: Pharmacology and Therapeutics of the Materia Medica. Sixteenth edition. 1940.
Easterbrook, C. C.: The Chronicle of Crichton Royal, 1833–1936. 1940.
Ferriman, D.: Acrocephaly and Acrocephalosyndactyly. 1941.
Forrai, E.: Inter-Relation of Abdominal Diseases. 1941.
Gibberd, G. F.: Short Textbook of Midwifery. Second edition. 1941.
Gosse, P.: Squire of Walton Hall. The Life of Charles Waterton. 1940.
Haden, R. L.: Principles of Hematology. Second edition. 1940.
Harvey, W. F., Dawson, E. K., and Innes, J. R. M.: Debatable Tumours and Animal Pathology. 1940.
Holt's Diseases of Infancy and Childhood. Eleventh edition. Revised by L. E. Holt and R. McIntosh. 1940.
Horsley, J. S., and Bigger, I. A.: Operative Surgery. Fifth edition. Two vols. 1940.
Illingworth, C. F. W., and Dick, B. M.: Textbook of Surgical Pathology. Fourth edition. 1941.
Kendall, J. I.: The Microscopic Anatomy of Vertebrates. Second edition. 1940.
Levine, S. A.: Clinical Heart Disease. Second edition. 1940.
Lewis, J. T.: Principles and Practice of Diphtheria Immunization. 1941.
McCrea, E. D.: Diseases of the Urethra and Penis. 1940.
Macleod, J. M. H., and Muende, I.: Practical Handbook of the Pathology of the Skin. 1940.
Maher, C. C., and Wosika, P. H.: Electrocardiography. Third edition, 1940.
Möller, C., and Rasmussen, E.: The World and the Atom. 1940.
Myers, J. A.: Man's Greatest Victory over Tuberculosis. 1940.
Oliver, J.: Architecture of the Kidney in Chronic Bright's Disease. 1939.
Packard, E. N., Hayes, J. N., and Blanchet, S. F. (editors): Artificial Pneumothorax: Its Practical Application in the Treatment of Pulmonary Tuberculosis. 1940.
Reid, W. D.: Manual of Cardiology: Clinical Methods and Case Histories. 1940.
Savage, Wm. (Sir): Practical Public Health Problems. 1941.
Schnitker, M. A.: The Electrocardiogram in Congenital Cardiac Disease: A Study of 109 Cases. 1940.
Teagarden, F. M.: Child Psychology for Professional Workers. 1940.
Vernon, P. E.: The Measurement of Abilities. 1940.
Watson-Jones, R.: Fractures and Other Bone and Joint Injuries. Second edition. 1941.
Webster, J. H. D.: Periodicity and Cause of Cancer, Leukaemia and Allied Tumours. 1940.
Whiting, A. J., and Sutton, G. E. F.: Aids to Medical Diagnosis. Fifth edition. 1940.
Wilson, M. G.: Rheumatic Fever: Studies of the Disease during the First Three Decades. 1940.

Medical Services of H.M. Forces Appointments

ROYAL NAVY

Surgeon Commanders A. E. P. Cheeseman and G. E. D. Ellis have been placed on the Retired List with the rank of Surgeon Captain.

Surgeon Lieut.-Commander H. L. Belcher to be Surgeon Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Probationary Temporary Surgeon Lieuts. T. D. Pilcher, O. G. Lloyd, B. S. Sher, G. Morrice, W. E. Willis, J. R. Oliver, T. J. A. Phillips, G. Sangster, K. M. Tomlinson, F. G. C. Walker, J. L. Elliott, T. R. Rutherford, J. B. Porteous, and C. H. Boyd to be Surgeon Lieutenants.

Probationary Temporary Surgeon Lieuts. P. N. Shutte, E. C. Coaker, T. B. FitzGerald, I. S. R. Bain, A. G. Cunningham, W. A. Burnet, E. J. Delorme, G. V. Blaine, H. P. Clark, C. J. Bintcliffe, W. T. K. Cody, G. Campbell, D. L. Carmichael, P. M. McAuley, W. S. Milne, W. P. Collingwood, J. H. Comloquoy, W. Cross, T. S. Eimerl, E. R. S. Grice, J. A. L. Leeming, A. C. C. Hughes, G. Garmany, A. W. McHaffie, R. Lawrie, N. B. Mundy, H. Jackson, R. S. G. Arnott, H. H. Johnson, H. E. D. Gale, W. Guthrie-Oman, R. T. Norman, W. J. Elliott, G. A. Hendry, C. W. D. Lewis, C. P. Madden, S. L. Hetherington, M. R. Ewing, R. L. Lawrie, J. R. Hart, L. D. De Launay, D. A. Daly, W. H. R. Cook, I. S. Jacklin, G. K. MacKenzie, S. S. F. Pooley, D. C. Galloway, A. G. Leakey, J. F. Buchan, J. W. Hall, G. A. Robinson, P. S. Hawkins, D. V. John, F. Hedley, A. C. Franks, F. C. Edington, J. D. D. Boswell, S. Meleck, B. Robinson, C. J. Martin, J. G. Pritchard, W. McL. Gillespie, R. O'Kane, J. B. Raffan, G. C. Glennie, J. MacRae, T. R. Simpson, R. M. M. Hunter, M. D. C. Hosford, J. M. G. Nixon, S. P. Cornell, G. W. Kennedy, P. D. Scott, L. V. Gimson, G. E. Loxton, G. R. C. Rayner, M. H. Small, E. T. Holman, P. D. MacLellan, A. S. S. Playfair, A. McKerlie, G. R. Thorpe, J. Price, A. B. Lennie, R. M. Bell, J. Jackson, A. S. B. McNeil, J. H. Kyle, O. H. Jones, C. A. Jackson, R. H. Elphinstone, I. H. Millar, J. M. Naish, L. H. James, A. J. O'Friel, C. E. Miller, E. P. J. Moran, W. R. Rochester, P. Walton, C. MacDonald, A. Watt, E. J. Wood, S. F. Taylor, W. P. Sweetnam, B. C. M. Reed, G. D. Taylor, J. F. Mullan, J. M. H. Mitchell, P. J. E. Palmer, R. C. Ponder, H. C. Pickering, C. Lewthwaite, L. D. Walker, N. L. Hulse, J. H. E. Summerhill, H. P. Dick, D. A. Thomson, F. J. Robertson, J. I. A. Jamieson, G. B. Stratton, D. W. Geidt, J. N. Hunt, E. E. T. Taylor, J. V. Rose, J. H. Graves, A. Young, G. H. Stuart, H. G. Easton, and R. Barrie to be Temporary Surgeon Lieutenants.

ARMY

Colonel (acting Major-General) P. S. Tomlinson, D.S.O., late R.A.M.C., to be Temporary Major-General.

ROYAL ARMY MEDICAL CORPS

The following Captains (Short Service Officers) have been appointed to permanent commissions: R. J. G. Morrison, J. A. G. Carmichael, A. T. Marrable, J. Shields, C. W. Maisey, T. M. W. D'Arcy, D. Wright, (War Substantive Major) J. W. Orr, and (Temporary Majors) K. H. Harper, M. F. Kelleher, and J. A. MacDougall.

LAND FORCES: EMERGENCY COMMISSIONS

ROYAL ARMY MEDICAL CORPS

War Substantive Captains C. Shearer, G. Young, J. H. Ripley, H. R. G. Davies, and C. L. Taylor have relinquished their commissions on account of ill-health.

The names of the following Lieutenants are as now described and not as notified in the *Supplement* to the *London Gazette* dated February 18 and 28, and March 18, 1941: M. R. W. Spaeck, J. B. Hannah, N. C. Sharp, D. L. Bayley, T. V. H. Richards, B. McD. Johnson, J. H. Young, C. B. Ainscow, J. M. W. Wells, L. M. Kiernan.

The initials of G. S. A. Knowles are as now stated, and not as notified in a *Supplement* to the *London Gazette* dated November 6, 1939.

Lieuts. D. W. Warren, M. McLearie, and R. Nightingale have relinquished their commissions on account of ill-health.

To be Lieutenants: H. Goldsmith, J. H. Hale, D. A. R. Anderson, H. M. Bennett, G. Blair, W. J. Cameron, H. C. Carr, M. Cram, A. Farquhar, G. A. R. Gibson, J. K. Hampshire, A. T. Hunt, D. B. Jamie, W. H. L. La Frenais, L. Lloyd-Evans, H. MacLean, T. F. Main, S. S. Mair, Js. B. Malcolm, T. M. Pemberton, J. C. Renshaw, M. S. Richmond, G. D. Roworth, J. Scobbie, W. Stoddart, J. Sutton, J. E. Taylor, W. P. Wallace, R. Wright, F. H. MacB. Dummer, C. J. S. Flood, J. H. France, W. D. Giffen, M. Good, E. Keidan, R. T. Kiddie, H. McKeown, J. M. McLean, D. M. Milne, J. S. Montgomerie, H. M. Weaver, E. G. W. Clarke, J. C. Goligher, M. Price, H. L. Koebner, R. L. Mackay, P. R. Wilson, J. S. Hunter, C. W. M. Whitty, T. G. McCarthy, J. Burton, V. Guyer, J. K. Hewat, C. E. Perry, O. A. Savage, H. MacN. Symons, W. R. Stephen, T. G. Anderson, J. K. Houston, P. H. Beamish, P. J. England, I. C. Fraser, E. Geal, E. E. Swaby, J. McMichael, M. A. G. Ward, G. A. F. Quinnell, C. de V. Shortt, E. MacLaine, E. G. Muir, P. G. F. Harvey, R. Anderson, A. J. Bain, J. Bunting, W. V. A. Erskine, H. Fuld, S. R. Goshng, J. Harders, C. Kenton, P. Kinnear, J. W. Leslie, G. I. W. Usk, R. J. A. Macdonald, W. Macfarlane, W. H. Mackenzie, D. P. Macmillan, E. H. Moore, R. Posner, J. Scorgie, M. S. Segall, S. R. N. Smith, J. M. Terris, S. M. Thompson, I. D. Willatt, G. T. T. Wishart, M. Elias, J. S. Foster, H. Goodwin, B. E. P. McCullough, L. Spira, J. O. D. Williams, D. Wyllie, G. F. H. Drayson, D. A. D. Montgomery, R. A. Coughlan, D. Feldman, J. Gordon, J. J. Spira, T. M. A. Lewis, R. L. Hartley, A. S. Thenuwara, S. B. Karani, W. Aird, J. R. Allan, J. S. Kennedy, A. H. Lafone, J. Morrison, C. N. Robinson, B. Sandler, N. W. Snell, J. B. Stafford, J. Blum, G. G. Dickie, R. A. Beaver, W. Darby, H. W. John, J. Patton, R. G. Tiechurst, T. Crawford, H. W. Perkins, J. W. S. Macfie, R. W. Mellor, R. Thornley, W. M. Dickson, I. B. Morris, J. B. Young, P. W. Green, A. L. H. Rackham, W. H. R. Lumsden, C. T. Jones, E. R. Cullinan, J. Taylor, W. C. Blackham, H. C. Edwards, A. C. Byles, D. McD. I. Hartmat, R. W. Brookfield, E. Alderson, H. B. Follit, J. G. T. Lunn, J. S. McGillivray, N. W. Hammer, S. Barclay, J. C. Carson, C. Cotterill, J. F. K. Grieve, H. Kennedy, K. I. W. Kleinberg, H. S. Laird, J. McGlade, I. McLennan, J. J. Murray, A. McI. Runcie, W. M. H. Shaw, M. J. MacKenzie, I. Calvert-Wilson, H. F. Devlin, J. B. Farquhar, C. G. Johnson, I. R. Jones, A. M. Loughran, R. G. Paley, J. Urquhart, J. D. Wilson.

Lieut. D. F. Suttie, from Camerons (Emergency Commission), to be Lieutenant.

Dr. E. K. P. Harris (Medical Officer with the relative rank of Lieutenant) has relinquished her appointment on account of ill-health.

The name of Margery Feachem is as now described and not as notified in a *Supplement* to the *London Gazette* dated March 7, 1941.

To be Medical Officers with the relative rank of Lieutenant: Celia M. M. Calvert-Evans, Emily E. Cass, Phyllis M. Edwards, Alfreda W. Krichruff, Hyacth M. Warwick, Sheila Carmichael, Hilda M. S. Davidson, Jean Mather, Jessie M. Hudson, Iris Copeman, Alice M. Watt, Mary M. Thomson, Julia M. Brown, Eileen McC. Gibson, Mary Rennie.

THE ARMY DENTAL CORPS

Captain W. G. S. Wilson, Southern Rhodesia Medical Corps, to be Lieutenant.

ROYAL AIR FORCE

ROYAL AIR FORCE VOLUNTEER RESERVE

The notification in the *London Gazette* dated February 28, 1941, concerning C. C. Edwards should read Squadron Leader instead of Flying Officer.

To be Honorary Flight Lieutenants: J. G. Lynch, R. J. Sims, J. Tobson-Smith.

To be Flight Lieutenants for the duration of hostilities: W. Leslie, B. J. Bickford, M. O. J. Gibson.

The notification in the *London Gazette* dated February 28, 1941, concerning E. H. Hudson should read Flight Lieutenant instead of Flying Officer.

Flying Officers O. H. Sennett, D. Stevenson, J. Brown, W. Goulstone, E. I. Davis, J. O'Brien, A. L. Collins, R. F. H. McElligott, E. G. Patchett, A. E. R. Chalmers, C. Barton, G. E. B. Scott, M. C. T. Reilly, R. Piper, J. E. T. Strickland, H. Whittle, A. B. Rowlands, G. Macnaughton, J. C. Hill, H. B. Sutton, G. Shneerson, A. J. Beddie, P. S. Meyrick, B. W. Sanderson, and N. A. F. Young have been promoted to the war substantive rank of Flight Lieutenant.

Miss Winifred H. Redmond has been promoted to the relative rank of Flight Lieutenant.

To be Flying Officers for the duration of hostilities: W. C. D. Bewick, C. P. Williams, J. K. Swanston, W. P. Soutter, J. J. O'Dwyer, R. L. Markham, J. R. C. Williams, H. Brewster, J. M. Crawford, W. H. G. Elliott, J. G. Fee, J. Lillie, I. M. Macgregor, J. James, A. E. Ward, W. G. Zorab, J. S. H. Scott, F. A. Thompson, E. R. T. Crabb, S. E. White, T. J. Conran, S. Goide, M. Crowley, A. A. Macgibbon, E. J. G. Murray, I. B. Good, R. H. Francis, E. G. Fox, J. Guthrie, T. H. Redfern, C. M. Dickins, T. L. Barbour, F. J. R. Stoneham, P. E. Percival, R. J. L. Ferris, I. W. H. R. Cran, R. E. J. Clarke, J. Burdon-Cooper, A. J. S. B. Tawse, R. W. S. Marshall, J. E. McKnight, W. E. Greenwood, L. H. McGrath, C. W. Hall, B. G. Gretton-Watson, A. Buchan, T. E. Griffiths, C. F. H. Wiessner, W. Kirk, E. F. Mason, A. Webb-Jones, A. C. Bingold, L. J. Stoll, P. A. Dawes, A. D. Macdonald, E. W. Jones, H. L. B. Girvan, M. T. Gallagher, E. S. Frazer, J. G. Smith, J. Tolland, A. L. Walby, R. B. Walker, R. A. Mitchell, M. L. Mason, W. W. Cashmore, D. M. Douglas, S. R. Warren, G. B. Schofield, A. A. Simpson, J. L. Sinnette, D. E. Williams.

The notification in the *London Gazette* dated March 28, 1941, concerning Flying Officer A. F. Baldwyn should have appeared under the heading Royal Air Force instead of the Royal Air Force Volunteer Reserve.

Postgraduate News

The Fellowship of Medicine announces the following courses in preparation for the next M.R.C.P. examination: chest diseases at Brompton Hospital, Mondays and Thursdays at 5 p.m., May 26 to June 19; nervous diseases at West End Hospital for Nervous Diseases, Tuesdays and Fridays at 3.30 p.m., May 27 to June 20.

WEEKLY POSTGRADUATE DIARY

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.—*Mon.*, Course of lectures on War Surgery of the Extremities commences. *Daily*, 10 a.m. to 4 p.m., Medical Clinics, Surgical Clinics and Operations, Obstetrical and Gynaecological Clinics and Operations. *Daily*, 1.30 p.m., Post-mortem Demonstrations. *Tues.*, 11 a.m., Paediatric Clinic, Dr. R. Lightwood. *Wed.*, 11.30 a.m., Clinico-pathological Conference (Medical). *Thurs.*, 2 p.m., Dermatological Clinic, Dr. R. T. Brain; 2 p.m., Radiological Demonstration, Dr. Duncan White. *Fri.*, 12 noon, Clinico-pathological Conference (Surgical); 2 p.m., Clinico-pathological Conference (Gynaecological); 3 p.m., Sterility Clinic, Mr. V. B. Green-Armytage.

EDINBURGH POSTGRADUATE LECTURES.—At Edinburgh Royal Infirmary, *Thurs.*, 4.30 p.m. Mr. Bruce Dick: Surgical Aspects of Diseases of the Chest.

DIARY OF SOCIETIES AND LECTURES

ROYAL SOCIETY OF MEDICINE

Section of Therapeutics and Pharmacology.—Tues., 3 p.m. Annual general meeting. W. E. Dixon Memorial Lecture by Prof. J. A. Gunn: Future of Pharmacology.

Special Meeting of Fellows.—Tues., 4.30 p.m. To consider alteration in By-law I, 2. Nomination of officers and council for 1941–2.

General Meeting of Fellows.—Tues., 5 p.m. Ballot for election to Fellowship.

Section of Surgery.—At Horton Hospital, Epsom, Wed., 2.45 p.m. Annual general meeting. 3 p.m., Clinical demonstration.

Section of Dermatology.—Thurs., 4.30 p.m. Annual general meeting. Short papers.

Section of Neurology.—Thurs., 5 p.m. Papers by Dr. W. Russell Brain and Dr. G. Weddell.

Section of Obstetrics and Gynaecology.—Fri., 4.30 p.m. Annual general meeting. Case reports.

VACANCIES

EXAMINING FACTORY SURGEONS.—The following vacant appointments are announced: Cruden (Aberdeenshire); Royton (Lancashire); Darlington (Durham). Applications to the Chief Inspector of Factories, Queen Anne's Chambers, 28, Broadway, S.W.1, by May 20.

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

BIRTH

HUNTER.—At the Quarry Nursing Home, Shrewsbury, to Joyce (*née* Peat), wife of Roger B. Hunter, M.B., Bridge, Canterbury, a daughter.

MARRIAGE

POVEY—ROBERTSON.—At Leeds, on April 17, 1941, John E. Povey, B.Sc.Lond., Flight Lieutenant, R.A.F.V.R., to Margaret F. Robertson, M.B., Ch.B., D.R.C.O.G.

DEATH

SANJANA.—On March 22, 1941, Dr. Darabshaw Farduonji Sanjana, Sanjan House, Lawrence Street, Kelty, Fifeshire.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 17 1941

TRAUMATIC EPILEPSY AFTER GUNSHOT WOUNDS OF THE HEAD

BY

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The object of this paper is to summarize the results of an inquiry into the fate of men who sustained gunshot wounds of the head in the war of 1914-18, with special reference to the development of epilepsy. Through the kindness of the Director-General of Medical Services, Ministry of Pensions, 540 case notes have been examined. These were taken from the files of the group known as "four-year cases"; that is to say, all the patients survived long enough to be re-examined with a view to final award of pension four years after they were first "boarded" for head injury by the Ministry of Pensions. The material thus does not include those who died from the results of head injury within the first few years, before their pension reached the stage of final award. It is possible also that certain cases of minor injury not severe enough to receive provisional award of pension may have escaped the survey; but a man bearing on his head a visible scar or a hole in his skull as a result of war service seldom failed to appeal and to obtain an award of 20% or more. With these reservations the group may be accepted as a fair sample of gunshot wounds of the head involving bone, and a somewhat selected sample of the severer scalp wounds.

Information Available

Relating to each case are four groups of documents. (1) There are the strictly medical papers—the field medical card, and corresponding medical cards completed at the base hospital in France or elsewhere and at the general hospital in the United Kingdom, and one or more Army Forms I 1237. (2) The medical board papers. Boards were held first, as a rule, when the patient was discharged from hospital, then at intervals of six months, and later of one or two years, until the final board, usually in the period of 1922-5. When a final award had not been granted because the case did not appear to be in a final and stationary condition, or when later appeals were lodged by the man, further medical board reports are available, perhaps as late as 1930, 1935, or more recently. (3) Long after the war many pensioners were admitted to Ministry of Pensions hospitals for observation, and hospital reports are often available. (4) In addition there are the man's non-medical military documents, a collection of papers relating to the non-medical side of pension arrangements, including any letters from the man himself or from his relatives or friends. Should the pensioner at any time come into conflict with the civil power a record of the crime and sentence is to be found.

The most serious omissions from the medical notes are the family history and the previous history of the patient.

Selection of Cases

Of the 540 case records examined 317 have been abstracted, the rest being discarded. Rejections were made solely on account of incomplete notes, especially an incomplete operation note. All cases having adequate notes were accepted, no matter how trivial the injury. No injuries from causes other than gunshot wounds are included in the present series. Wounds of the cerebellum have been excluded.

Incidence of Epilepsy

Of these 317 cases, 107 (34%) had fits. Every patient whose notes record one or more fits is included, yet this figure is perhaps a little low. It has not always been easy to determine from the records whether or not a patient has had fits, but it is reasonably safe to assume the fits to be genuine when they are accepted as an attributable disability by medical boards. The majority of men complaining of fits were admitted to Ministry of Pensions hospitals for observation, often for long periods.

It is possible that an occasional patient was falsely accepted as epileptic. On the other hand, it is probable that a number of cases of genuine epilepsy without full-fledged convulsions were missed. In the records examined there is little or no reference to automatic states and to less outspoken forms of epilepsy. In some cases not regarded by medical boards as genuine epilepsy the description of attacks is nevertheless convincing, and these cases are included in the 107. But they are few, and it is therefore fair to conclude that the figure of 34% is at least not an over-estimate.

The following case reports illustrate the varieties of epilepsy encountered and indicate the sort of data on which the present survey is based.

Major Epilepsy without Obvious Focal Onset

Case No. 108.—Wounded on October 4, 1918, at the age of 17. While advancing the patient was struck by a shell splinter in the left temporal region and knocked down. He stated that he was able to get up immediately and walk to the dressing station, where he lost consciousness, and did not "come to" till three weeks later in England. On arrival at the base hospital he was found to be dysphasic and to have weakness of the right arm, leg, and face. Radiographs revealed a depressed fracture and two metallic fragments one centimetre within the skull, near the Sylvian point. At operation two days after the injury fragments of depressed bone were removed and there was found to be "some loss of brain substance"; the foreign bodies were not seen. Six days after the injury he had a convulsion with loss of consciousness. Occasional slight fits occurred during the rest of his prolonged stay in hospital (the wound did not heal for seven months). He remained hemiplegic, though his leg regained enough power to enable him to walk, and his memory and intelligence were said to be good. The fits grew more frequent; in 1919 they took place twice a month, and in 1921 two operations were performed. The first, in February, revealed the hole in the skull filled with fibrous tissue. Beneath it lay a "large subdural

cyst," which was swabbed out with iodine and filled with a graft of fascia lata and muscle. The fits continued, but were fewer. In June of the same year the wound was reopened, a fruitless search made for the foreign bodies, and a second graft applied. For a time he had up to six fits a week, but the following year only one a fortnight. Improvement, however, was brief. In 1925 fits took him so often that he was unable to go out alone; in 1926 he had two a day, and in 1927 four. In 1930, fifteen years after the injury, fits were so frequent that he required constant attendance.

Case No. 124.—Wounded on July 6, 1915, at the age of 19. This man was struck in the posterior part of the left frontal region near the vertex, and was said to have been unconscious for seven days. He was trephined next day; bone fragments, hair, and dirt were removed from the surface of the brain, the wound drained, and the edges drawn together. Healing was complete in twenty-five days and no focal signs are recorded. Six to nine days later he had two attacks of loss of consciousness, preceded by trembling of both arms. He recovered and was able to carry on his pre-war work of farm labourer, and a year later was engaged in felling timber. In 1920, however, he had another fit, with generalized convulsions in which he bit his tongue and wet himself. For more than a year there was no further attack. In 1922 fits began again, and by 1924 took place every month. When last examined in 1926, eleven years after the injury, he was having fits every week.

Epilepsy with Focal Onset

Out of a total of 107 cases of epilepsy, 33 (31%) are recorded as having a focal onset. This group consists mostly of fits starting with jerking or some abnormal sensation in a limb. In addition there are two cases of occipital injury in which the fits began with flashes of light; three of occipital injury in which the fits began with or were characterized by dimness of vision and blindness; and one of injury to the left temporal lobe having minor fits in which speech was lost. No instances of uncinate fits are recorded. It is possible, therefore, that the focal features of attacks have been overlooked in some cases.

Case No. 175.—This man was wounded at Gallipoli on May 24, 1915, at the age of 31. A bullet glanced off the side of his head, causing a depressed fracture over the lower part of the left Rolandic area. He was unable to speak, and his right arm and leg were powerless and insensitive. Trephining was performed aboard a hospital ship, but the condition of the dura is not stated. Within a year he was able to walk well, but there was still severe sensory loss in his right hand, and speech was hesitant. Fourteen months after the wound he began to have fits. Before a fit he "only saw half a thing," and his right hand went numb; occasionally he lost consciousness and wet himself. At first fits were infrequent; by 1920 they occurred monthly, and in 1924 every week. He was, however, able to retain his job as a gateman. He died of heart failure due to mitral disease in March, 1937.

Case No. 268.—Wounded on July 27, 1917, at the age of 29. A bullet pierced this soldier's steel helmet and ploughed a furrow in his scalp from front to back, an inch to the right of the middle line. The wound was excised four days later, and the bone was seen to be grooved but not broken. The wound was septic, and he lay five months in hospital. The first fit took place a month after he left hospital. It began with pain in the left arm, and consciousness was lost. Similar attacks followed at intervals of about three months. In 1923, seven years after the injury, they ceased. For ten years he had no more. But in 1933 attacks occurred every week for a time, yet ceased once more four months before his last medical board examination (held the same year), at which his pension remained at 50%. There is no record of his ever having had focal signs.

Case No. 127.—Nine months previously this patient had sustained a slight scalp wound, but had remained on duty. On August 20, 1917, at the age of 21, he was struck on the right side of the head by shrapnel balls. One penetrated just in front of the ear, lodged in the bone, and drove a shower of bone fragments into the parietal lobe. On admission to hospital he was semiconscious and disorientated. His head and eyes were deviated to the right, but he could be induced to look to the left, this movement being accompanied by nystagmus. There was left hemiplegia, complete in the arm and almost complete in the leg. Sensory tests were unreliable. He was operated on about twelve hours after injury by Harvey Cushing (1918, Case 36).* The wounds were excised and sutured. The shrapnel ball in the petrous bone was removed, together with many fragments of petrous bone and pieces of helmet lining. In the parietal region the bone and the shrapnel ball in it were removed *en bloc*. From the brain itself fragments of bone, much clot, and disorganized brain were removed to a depth of 5 cm. The wounds healed by first intention. A month later his left leg was nearly normal, and within four months of injury his left hand had a fairly good grasp and was still improving. He was deaf in the right ear. In January, 1918, after he was evacuated from France, an aluminium plate was inserted. A week later he had an attack of twitching of the left side of the face and left arm. He remained fully conscious, the fit was slight, and there was no further attack for a year. Thereafter other attacks followed with increasing frequency, and in 1924, seven years after the wound, they took place two or three times a month. Consciousness was never lost, but whereas twitching had been confined to his arm and face, in later years it spread to his foot.

Petit Mal

Case No. 100.—Wounded on June 24, 1917, at the age of 42. A shell splinter glanced off this man's skull in the left fronto-parietal region, causing an extensive scalp wound but not injuring the bone. His right arm and leg were found to be weak. Power soon returned, and he was able to serve at home till demobilization. He complained that his right hand was still numb, and he was found to have astereognosis, impairment of postural sense in the right hand and right foot, and a right extensor plantar response. Nevertheless he was able for a time to take up his old employment as a blacksmith's striker. When last examined in 1931, fourteen years after the injury, he reported that he had been obliged to relinquish that particular work as he had suffered for some four years from attacks "in which he lost himself for a few minutes."

Case No. 148.—This man sustained a severe penetrating wound of the left lower parieto-occipital region, through which the brain fungated. Four months later he began to have attacks which he described as follows: "I feel something inside my head which feels altogether strange. Something goes like a flash through my head and I feel unsteady. At times when I wish to speak my speech goes twisted."

Depth of Wounds and Fits

The incidence of fits in relation to the depth of wound is shown in Table I.

TABLE I.—*Relation between Epilepsy and Depth of Wound, Foreign Bodies, etc.*

Group	Site	No. of Cases	No. with Fits	% with Fits
1 ..	Scalp	66	16	24
2 ..	Fractured skull; dura intact	104	24	23
3 ..	Metal in brain	42	16	38
4 ..	Metal removed from brain	30	16	53
5 ..	Dura torn; brain injury; bone fragments removed or *in situ* (exclusive of Groups 3 and 4)	57	26	46
1 & 2	Dura intact; all cases	170	40	23
3, 4, 5	Dura penetrated; all cases	129	58	45

Fits are twice as frequent when the dura is penetrated. Nearly half (45%) of such cases are affected.

Metallic Foreign Bodies and Fits

It is remarkable to find that patients who retain fragments of metal in the brain are less liable to fits than those from whose brain metal has been removed (Table I). There are several possible explanations. Surgical removal of the missile may greatly increase the damage to the

* Dr. Cushing's case report describes the head wounds as being on the left side, but the Ministry of Pensions records leave no doubt that they were on the right side.

brain or, under conditions often obtaining in war, increase the sepsis. Another and more acceptable explanation is that most of these retained missiles are small splinters, often less than a centimetre in diameter and often with a small entrance wound. When a man is struck by a large lump of metal it kills him if it penetrates far; if it remains near the surface, though it can be readily removed, it causes much destruction. Consequently, of men surviving penetrating splinter wound of the head, those in whom the metal is retained may well have less cerebral damage and therefore less liability to fits.

The surmise that the cases in which metal was removed from the brain often have more serious brain damage than those in which metal remains *in situ* is supported by the fact that 12 of the 30 from whom metal was removed developed brain fungus, whereas only 3 of the 40 from whom the metal was not removed had fungus. Furthermore, included in the "metal removed" group are 13 through-and-through wounds, and these are usually severe injuries.

The important fact that emerges is that in penetrating wounds the mere presence of a small piece of metal in the brain does not increase the risk of epilepsy.

Other Late Complications, and Deaths

It may be added that so far as the late course is concerned the presence of metal in the brain does not seem to affect the outlook in any way. In fact, apart from epilepsy, late complications are astonishingly rare in the whole series, even in the severest wounds. It is to be remembered that the present study affords no information concerning fatal complications arising within the first four or five years after injury, nor are the records complete enough to give information concerning minor degrees of mental deterioration. No cases in the series were still receiving active treatment, so that the material gives no information about patients requiring permanent institutional treatment on account of psychosis.

Up to the end of 1940 14 patients (4.4%) have died. In only one case (No. 126) can death be attributed with certainty to the injury; in two others (Nos. 79 and 265) there is a probable direct connexion.

Case No. 126.—Wounded on November 1, 1916, at the age of 22. A shell splinter entered the brain in the left Rolandic region, causing a right hemiparesis. The patient was not operated on till the fifth day, when a cerebral abscess was drained. Considerable recovery of power took place, and he was able to work as an auxiliary postman till 1930, when minor attacks of epilepsy began. Major fits developed a year later, ending in a fatal status epilepticus in September, 1934, eighteen years after the wound. Necropsy revealed a "cyst" on the surface of the brain, but there was no trace of abscess or other septic complication.

Case No. 79.—Wounded on September 4, 1917, at the age of 20. There was a small wound of entrance in the left temporal region, and the patient was dysphasic and weak in the right arm. Operation next day revealed much pulped brain, which was removed, along with several fragments of bone. The wound healed in twenty days, and the dysphasia and weakness improved rapidly. *X*-ray examination showed a piece of metal, 1 by 0.5 by 0.4 cm. in diameter, 1 cm. to the left of the middle line and 1.5 cm. above the sella turcica. Fits began in the following year and grew more frequent. In 1933 glycosuria was discovered, and the patient died in diabetic coma in July, 1937, twenty years after his wound.

Case No. 265.—This man was wounded on February 27, 1917, at the age of 23. A scalp wound was sustained in the right parietal region. At operation three days later the wound was excised and the bone was found to be intact. Major fits began in June, 1922, causing him to lose his job as stage-door keeper. By 1929 fits were frequent and prolonged. He died in October, 1938, of "acute bronchitis and chronic epilepsy," twenty-one years after being wounded.

The cause of death in the remaining 11 cases is recorded as: heart disease (5) malignant disease (2), perforated gastric ulcer (1), bronchopneumonia (1), phthisis (1), influenza (1).

In-driven Bone Fragments and Fits

With regard to the significance of in-driven bone fragments and the risk of fits it has not been possible to extract satisfactory data. Judging by our experience at the Military Hospital for Head Injuries and by the reports of members of the Society of British Neurological Surgeons, bone fragments are driven into the brain in almost all penetrating injuries. Good radiographs are needed to detect them, and it is clear from the samples of old *x*-ray plates included in the Ministry of Pensions files that reports of negative radiological findings are unreliable. Many operation notes state that in-driven bone fragments were removed, but there is no guarantee that all of them were. Pieces of buried bone may be overlooked at operation, even with the help of modern radiography; with poor radiographs, or none, fragments will often be left.

Non-penetrating Wounds and Fits

It is surprising to find the incidence of fits in scalp wounds as high as 24% (Table I)—no less, actually, than in wounds fracturing the skull and often depressing bone. The fact that this series of scalp wounds is to some extent selected may account for the high incidence of fits. Many a scalp wound will in itself cause no disability, and the patient may only appeal for a pension should epilepsy follow. But there are other points to be considered. Scalp wounds due to projectiles are by no means the same as those seen in civil practice and due to a fall on the pavement or a blow with a brick. The outward effect on the scalp in the shape of a more or less linear cut is the same, that on the brain beneath quite different. The brick imparts its momentum to a wide area of the skull and brain, or, rather, to the whole head, and usually stuns the victim. The bullet or splinter pierces the scalp and strikes the skull, a very small area of which absorbs its momentum, and often the patient is not concussed. Should the bone be broken it is remarkable how localized the fracture is—often no larger than the missile—showing how concentrated and focal is the blow. It is the exception to see widely radiating cracks which indicate diffusion of force. There is also ample clinical evidence to show that a concentrated impact can injure the underlying brain without breaking the bone, for in these cases focal signs are common (Jefferson, 1919; Cairns, 1941). In this series of 170 cases in which the dura was intact 51 (30%) had focal signs of cerebral damage. Of 104 cases in which there is a note on the state of consciousness 25 are known not to have been unconscious, yet 7 of these developed fits, and in 4 the skull as well as the dura was intact.

Though one cannot readily accept the high figure of 24% as the true incidence of epilepsy in wounds no deeper than the scalp, it is clear that scalp wounds due to projectiles are more likely to be accompanied by local damage to the brain, and therefore epilepsy, than scalp wounds seen in civil practice.

Sepsis and the Incidence of Fits

An important aspect of the problem of traumatic epilepsy is the incidence of fits in relation to sepsis. This is shown in Table II.

TABLE II.—*Relation between Epilepsy and Wound Sepsis*

	No. of Cases	No. with Fits	% of Fits
Wound healed in 15 days	59	13	22
,, 15–30 days ..	53	17	32
,, unhealed after 60 days ..	53	24	45

In this series fits developed twice as often in cases of severe and prolonged sepsis as in those healing by first intention. To obtain a truer estimate of the influence of sepsis the figures must be analysed further. Since both fits and sepsis are commonest when the wounds are deep and severe, the causal relation between sepsis and fits suggested by these figures might be fictitious. In Table III, therefore, the cases are grouped according to the integrity of the dura mater, and we see that the same relation holds for scalp wounds as for penetrating wounds—namely, that fits are commoner when wounds are septic.

TABLE III.—*Relation between Epilepsy and Wound Sepsis*

		% with Fits
Dura intact	Healed in 15 days	12
	,, ,, 15-60 days	30
	Unhealed in 60 days	32
Dura penetrated	Healed in 15 days	36
	,, ,, 15-60 days	50
	Unhealed in 60 days	57

Site of Wound in Relation to Incidence of Epilepsy

Too much reliance should not be placed on these figures (Table IV) nor on those previously published. It is often stated that fits are commonest in parietal lesions, but it is not always clear if "parietal" refers to the bone or to the lobe. There is also a tendency, seen in the records of this series, to describe as parietal any wound not frankly frontal, temporal, or occipital. Furthermore, the damage to the brain giving rise to the fits is not necessarily directly beneath the site of bone injury. For what they are worth the figures (Table IV) show that wounds in and about the Rolandic area are most often followed by fits, and polar wounds least often.

TABLE IV.—*Site of Wound in Relation to Incidence of Epilepsy*

Site		No. of Cases	No. with Fits	% with Fits	% with Fits, All Cases; assuming Equal Proportion of Penetrating and Non-penetrating Wounds
Frontal*	Dura intact	49	11	22	26.5
	Dura penetrated	35	11	31	
Rolandic	Dura intact	26	10	38.5	46.0
	Dura penetrated	28	15	54	
Parietal*	Dura intact	52	13	25	38.5
	Dura penetrated	23	12	52	
Temporal*	Dura intact	19	5	26	42.5
	Dura penetrated	17	10	59	
Occipital*	Dura intact	22	3	14	27.5
	Dura penetrated	22	9	41	

* Refers to the lobe, not the bone.

As a rough approximation it may be said that the further a wound lies from those portions of the cortex where sensori-motor function is predominantly represented, the less chance is there of subsequent epilepsy. Though it is legitimate to conclude that lesions near the sensori-motor cortex more often lead to epilepsy than do those at the poles of the cerebral hemisphere, the figures make it clear that the influence of the site of the wound on the liability to epilepsy is not great.

Concussion and the Incidence of Fits

The importance of local brain damage as the essential factor causing epilepsy in gunshot wounds of the head is emphasized in another way. In 104 cases the effect of the wound on consciousness is recorded. In 55 the dura was intact. In these the incidence of fits was practically as high in those remaining conscious as in those concussed (Table V).

TABLE V.—*Concussion and Incidence of Epilepsy*

	No. of Cases with Dura Intact	No. with Fits	% with Fits
Not unconscious	19	5	26
Unconscious	36	10	18

Time of Onset of Fits

The first fit may take place within a few hours of injury or may be delayed as long as twenty years. In this series information of the time of onset of epilepsy is available in 84 of the 107 cases, and is given in Table VI. When fits began while the patient was still in hospital the precise date of onset was usually available; but when fits began after discharge from hospital, which usually took place about three months after injury, the exact time of onset is often not recorded. The accompanying chart is

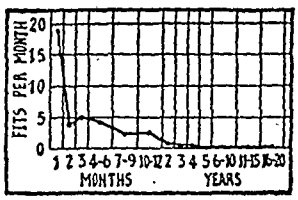


Chart showing monthly incidence of onset of epilepsy.

a graphical expression of Table VI, and shows the monthly incidence of onset of fits. For the reasons just stated the monthly incidence after the first three months is expressed on the chart as an average of three-monthly periods for

TABLE VI.—*Time of Onset of First Fit*

	Months						Years					
	1	2	3	4-6	7-9	10-12	2	3	4	5	6-10	11-15	16-20
No. of new cases of epilepsy	19	4	5	13	7	8	10	4	4	1	6	1	2

the remainder of the year, and as an average of each period of twelve months from the second to fifth year.

It will be observed that the rate of onset of fits during the first month exceeds by more than four times that of any subsequent month. After the initial fall it remains stationary till the sixth month, then falls again, till at the end of the second year a very low figure is reached. During the next three years the rate of onset declines further, and after four years is barely above the base-line. Only about one patient in twenty-seven developed epilepsy between the fifth and twentieth years.

Course of the Epilepsy

Information concerning the course of the epilepsy is available in 96 of the 107 cases.* In 30 of these, fits ceased some years before the final examination. The cases may thus be separated into two groups: those with persistent epilepsy and those with temporary epilepsy. By *persistent epilepsy* is meant that in which attacks were known to continue when the patient was last examined. By *temporary epilepsy* is meant that which is known to have ceased some years before the final award of pension.

The cases of temporary epilepsy fall into two distinct categories. In 11 of the 19 patients who had fits within the first days after injury (Table VI) fits ceased within the first fortnight, not to return (Category I). It is to be noted that there were no cases in which fits began in the

* These 96 cases comprise the 84 cases of which the time of onset is known and an additional 12 cases in which the later history but not the time of onset was available.

third and fourth weeks. This prevalence of epilepsy within the first fortnight after injury is doubtless connected with the presence of recent cortical damage due to haemorrhage or infection, and it accords with the not uncommon experience of fits in the first days after operations upon the brain, or after spontaneous subarachnoid haemorrhage. As in these conditions, fits occurring soon after injury are of little prognostic significance for the occurrence of late epilepsy.

There are a further 19 cases in which fits eventually ceased, but after a much longer interval (Category II). In 3 of these, fits began within the first two weeks and continued for two and a half, three, and four years respectively. The other 16 cases of temporary epilepsy began three months to two years after the wound, to disappear one to four years later. The average interval between the last fit recorded and the final examination is five years, the shortest two, and the longest eleven years.

Examples of prolonged temporary fits are afforded by the following cases.

Case No. 82.—Wounded on March 24, 1918, at the age of 24, by a shell splinter in the right lower anterior parietal region. Four days later at a base hospital the patient was trephined, and many fragments of bone were removed from the brain. Seven days after the wound he is described as being very dull but without paralysis. A week later a large fungus developed, and with it complete hemiplegia. He was doubly incontinent and remained critically ill for many weeks. Nine weeks after injury much of the fungus was cut away, and after a further three months the wound eventually healed. Very little power or sensation returned in the paralysed limbs. About a year after the wound he began to have fits every month, in which he lost consciousness and was incontinent. When last examined in 1934, sixteen years after the wound, he had had no fits for over ten years.

Case No. 210.—This man was wounded on June 23, 1916, at the age of 29, by trench-mortar fire. He was struck in the right frontal region. He was not unconscious, and the wound was trivial. Radiographs revealed neither foreign body nor fracture. No operation was performed, and he was back on duty at the end of the week. The next day he had an attack of twitching of the left hand, spreading to the whole of the left side, and he was sent to England. While under observation in hospital he had two more Jacksonian attacks. After leaving hospital in August he returned to duty and was sent to Salonika in April, 1917. He remained well until January, 1918, eighteen months after his wound, when the fits recurred and he had as many as fourteen in one day. On January 22 a trephine opening was made over the arm area of the motor cortex, some distance posterior to the site of the wound. Nothing abnormal was found. Fits continued on and off till June, then grew less frequent and ceased. At the time of his last attendance before the medical board he had had no fits for five years; his sole complaint was of giddiness on stooping at his work as a farm labourer, and he was awarded a pension of 30%, mostly on the basis of the trephine hole in his skull. He had never appealed for more pension.

In the 19 cases categorized as prolonged temporary epilepsy there may be some that have had unrecorded attacks since the last examination, but in view of the fact that some of the patients have been free from fits for as long as eleven years it is not possible to explain away the impermanence of the epilepsy on this basis. What part may have been played by sedative drugs cannot be determined from the information available. In two of the cases the delayed onset of septic complications in the wound may have contributed to the presence of the temporary epilepsy.

In all the cases in which fits began more than two years after receipt of the wound the epilepsy was of a persistent character, attacks continuing up to the time of the last examination (Table VII).

TABLE VII.—*Time of Onset of First Fit in Relation to the Course*

	Weeks			Months					Years	
	1	2	3 & 4	2	3	4-6	7-9	10-12	2	3-20
Temporary	12	2	0	0	2	3	0	1	3	0
Persistent..	3	2	0	4	3	10	7	7	7	13

Epilepsy is more likely to be of a persistent character in those cases in which the dura was penetrated by the wound (Table VIII).

TABLE VIII.—*Relation of Integrity of Dura to Temporary and Persistent Epilepsy*

	Temporary Fits	Persistent Fits
Dura intact	41% (7 of 16 ceased in first 2 weeks)	59%
Dura penetrated	26% (3 of 14 ceased in first 2 weeks)	74%

When the focal signs clear up the prospect of the epilepsy also clearing up is enhanced (Table IX).

TABLE IX.—*Influence of Recovery of Focal Signs on the Course of the Epilepsy*

	Temporary Fits	Persistent Fits
Transient focal signs	37%	12%
Permanent focal signs	26%	46%

These late follow-up results thus show that in about one-third of the patients having fits after gunshot wound of the head epilepsy may be of a more or less transient character. The earlier the fits begin the less likely are they to become persistent. In the first week after injury, if we may judge from this series, the risk of a man having fits is about 5% (15 of 317 cases), but the risk of the fits becoming persistent is only 1 in 5. Fits starting in the second week stand an equal chance of being temporary or of becoming persistent. As the weeks pass the odds against the fits being of a temporary character rapidly increase. From the sixth month to the end of the second year the risk of developing epilepsy is about 10%, but the odds favour the epilepsy becoming persistent as 5 to 1. If the onset of fits is delayed beyond two years the epilepsy will be persistent.*

Summary

The Ministry of Pensions records of 317 cases of gunshot wound of the head of the 1914-18 war have been examined with regard to the occurrence of epilepsy. The series represents a fair sample of head injuries that were severe enough to receive an award of pension yet not so severe as to cause death in the first four years after injury. The period of follow-up varies from about seven to twenty years. Blunt injuries and wounds of the cerebellum have been excluded.

Of the 317 cases 107 (34%) developed epilepsy.

Up to the end of 1940, 14 (4.4%) of the patients had died. One, and probably two others, died of complications of the brain wound, the remaining 11 of intercurrent conditions.

In cases in which the dura had been penetrated fits were twice as frequent (45%) as in the scalp and skull wounds in which the dura was intact (23%).

Scalp wounds due to missiles are more likely to be followed by epilepsy than are scalp wounds due to blunt injury.

There was no evidence that removal of metallic foreign bodies from the brain diminished the liability to epilepsy.

* In this connexion it is necessary to add that the series gives no information about the effect of operative excision of brain scars upon the course of the epilepsy.

Prolonged wound sepsis, as indicated by delayed healing, favours the subsequent onset of epilepsy both in cases in which the dura has been penetrated and in those in which the integrity of the dura has been preserved.

Epilepsy is more common after wounds affecting the sensori-motor cortex than after wounds of the polar regions of the cerebral hemisphere.

The presence or absence of concussion (immediate unconsciousness) after gunshot wound does not influence the subsequent liability to epilepsy.

The first fit may occur within a few hours after injury or may be delayed at least as long as twenty years. Epilepsy begins more often in the first two weeks, and thereafter the liability to develop epilepsy progressively diminishes.

In 30 of the 96 cases in which the course of the epilepsy is known fits ceased some years before the patient was last examined. This subsidence of epilepsy occurred most often in cases in which fits began in the first fortnight after injury, less frequently when fits began within the first two years, and never when the first fit occurred more than two years after the injury.

It is a pleasure to record my thanks to Dr. Prideaux of the Ministry of Pensions for his kindness in arranging for examination of the case records, and for much help in their interpretation. I am especially indebted to Colonel Hugh Cairns for his constant advice and great help in revision of this paper.

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RECENT MORTALITY FROM BRONCHITIS IN LONDON

BY

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Until the Registrar-General's Annual Statistical Review appears there is no information as to the main causes of death throughout the whole country in any period of time. Such records were last published for the year 1938, but figures are given for the administrative county of London under "short list" headings in the weekly returns, which have continued to be published since the outbreak of war. It is possible, therefore, to compare the experience of the years 1939 and 1940 with that of previous years for this area. The fifty-two weeks covered by the weekly returns do not coincide exactly with calendar years, but the slight error in taking the sum of the figures contained in them as a year's experience is unimportant. When this is done the very great increase in the number of deaths classed in 1940 as being due to bronchitis immediately hits the eye. Stocks (1940) has shown that the greatest single cause contributing to a general excess of deaths at ages over 45 in London between January 7 and February 17, 1940, was bronchitis. During this short period deaths from all causes exceeded the number expected on the basis of the same weeks in 1939 by 1,900, or nearly 33%; those from bronchitis were 800 (106%) in excess. With all the information of the Registrar-General's office at his disposal he was in a position to eliminate the several fallacies of comparison which will be discussed later, and the great increase in mortality from bronchitis he reveals must be accepted as real. The period of time was, however, very short, and a lesser but substantial excess in the deaths from some other causes, such as influenza, pneumonia, and heart diseases, which he demonstrated then would probably not have been sustained if the figures for a longer period had been examined by the same methods. He drew attention to the fact that these rises coincided with the exceptionally cold spell of weather in January and February. The point is important, for any change of mortality which is contemporaneous with the war is apt to be regarded as one of its results. The experience of the whole year therefore deserves as careful examination as possible.

Statistical Discontinuities

At the outset we are faced with certain difficulties. We know that the population of the administrative county of London has been falling steadily for some time. Between 1921 and 1931 it fell from 4,484,523 to 4,396,821—i.e., by nearly 2%. The mid-year estimate for 1938 was 4,062,800, representing a rapid decline of more than 8% during the seven years since 1931. So long as comparisons of death rates, not merely of deaths, are made this fall does not matter. In 1939 the population was estimated at 4,013,400, but this figure was adjusted for death-rate purposes to 3,780,700 in order to allow for evacuation movements and the exclusion from the death returns of non-civilian deaths since the outbreak of war (L.C.C. Report, 1939). Estimates for 1940 have not yet been published and are beyond the competence of anyone without access to official records, but it would not be unreasonable to suppose that the deaths in 1940 occurred among a population not exceeding, on the average, three and a half millions. If this is so we should expect a reduction in the number of deaths from all causes, as compared with the average of the previous ten years, of at least 16%, in the absence of factors inhibiting such a decline. Further, since the outbreak of war deaths have been assigned to the place of occurrence and not to residence. This may seriously affect comparability. In the circumstances of 1940 it would probably reduce the recorded deaths from natural causes in London. A still more serious interference with continuity is the change made by the Registrar-General in the method of classifying causes of death since the beginning of 1940. Whereas formerly the selection of one cause for the purpose of classification from more than one stated in a death certificate was made according to arbitrary rules, it is now determined so far as is possible by the order of preference indicated by the certifying practitioner. It is easy to see that this change (which was bound to come sooner or later) gravely affects comparison with the statistics of previous years. The adoption at the same time of the 1938 revision of the International List of Causes of Death is less likely to affect the comparability of figures relating to those causes with which this paper is concerned. It is, at least, clear that, for the present, the large number of deaths from bronchitis in 1940 has to be examined without any attempt to express it as a death rate, and that we must make sure that it is not an artificial result of changes in statistical procedure.

In a normal year nearly 90% of the deaths classed as due to bronchitis in London occur at ages over 45. It is therefore a cause mainly affecting those who have passed middle age, and it rapidly increases in old age. In 1939 92% were over 45, and in 1940 the proportion rose to 95%. The reasons for this rise may be disregarded for our present purpose. The point is that we are considering for 1940 a condition affecting the usual elderly age group of the population. It kills especially those whose cardio-vascular and renal systems, as well as the respiratory, are degenerating. When death occurs it must often be hard

for the practitioner to decide whether the most important cause is respiratory or cardiovascular or even, on occasions, renal. He may mention one or more of these systems in his certificate. In the past the Registrar-General of England and Wales has placed bronchitis very low in the order of preference. He chose a definite cardiovascular against any respiratory cause except lobar pneumonia (and, of course, influenza) if both were stated on one certificate, but a comparison recently made by the United States Government of the classification of the same group of certified deaths by the statistical departments of several countries showed that this policy was not so much favoured in some of them (Bureau of Census, Washington: Vital Statistics). Within our own country the preferences of medical practitioners differ from those shown by the Registrar-General in the past, and they also change with advancing knowledge, or, it may be, with medical fashion. Fashion, of course, has not suddenly changed in 1940. From year to year the Registrar-General has shown how bronchitis and old age have declined as assigned causes of death over 70 years of age, their place having been taken largely by heart diseases through increasing use of the terms "myocarditis" and "myocardial degeneration." A death ascribed to "bronchitis and myocardial degeneration" has hitherto been classed under the latter heading, whereas it is probable that if practitioners had been restricted to one single cause many would have preferred "bronchitis." The growth in the proportion of certificates showing such multiple causes no doubt accounts for much of the recorded fall in death from bronchitis and the rise of heart disease. The effect of following the practitioner's choice instead of the statistician's is revealed in the Annual Statistical Review for 1937 (Registrar-General's Review, 1937). It is shown for the records of 1936 and 1937 that a change from the arbitrary rules to acceptance of the certifier's choice would have reduced the deaths throughout England and Wales classed to heart diseases by about 28,000, or 22%, and increased bronchitis by 15,000 to 16,000, or 86 to 89%. Here, then, is a very great discrepancy, especially in the recorded mortality of bronchitis, which must vitiate all comparisons between 1940 and previous years until the figures are published by the Registrar-General in comparable form. On the other hand, nephritis would have been increased by only 1% under the new system.

Comparison with Previous Years

It is necessary to keep these facts in mind when examining the London statistics for 1940. For reasons already given it is not practicable to compare the death rates with those of previous years; but the actual deaths classified to certain causes are shown here in tabular form, their relation to those of previous periods being brought out in the second half of the accompanying table. In addition to the average for the ten years 1930 to 1939 (inclusive), the year 1929 has been shown separately because influenza was unusually prevalent then, a fact which has a bearing on the number of deaths classed to bronchitis.

For obvious reasons deaths from violence other than suicide are not included in the deaths from all causes for each period stated in the tabulation. The total number of deaths from all other causes has fallen by less than 9% as compared with 1930-9. As already indicated a greater fall might have been expected from the reduction of population, although old folks, who contribute heavily to the deaths, probably have not left London in such a high proportion as younger people. On the other hand, the deaths in 1940 were 27% lower than in 1929, a fact which, taken in conjunction with the very great difference in influenza certifications in these two years, confirms the common observation that no serious epidemic of this disease occurred in 1940. All respiratory causes taken together (including influenza) have risen, but to nothing like the level of 1929. In this group, however, bronchitis alone accounted for even more deaths than in 1929, the deaths from this cause far exceeding those from pneumonia for the first time in any of the years under consideration, and being nearly two and a half times the average of the previous ten years. The fall in pneumonia deaths was a little greater than might have been expected, and when this is viewed along with a considerable increase in the deaths classed to "other respiratory causes" as well as to bronchitis, it may be suspected that there has been an artificial inflation in these latter categories at the expense of pneumonia. The Registrar-General's inquiry indicated that the new system might lead to a very slight increase of recorded pneumonia, and the absence of epidemic influenza may have been in itself sufficient to account for the relatively low figure for pneumonia, but the influence of sulphonamide therapy has also to be kept in mind.

When we turn to the cardiovascular group a marked discrepancy is observed between the behaviour of deaths from cerebral vascular lesions (cerebral haemorrhage, apoplexy, etc.) and other cardiovascular causes. The sharp rise in the former is possibly statistical rather than real, although there was no indication from the Registrar-General's inquiry that this might be expected. The stress of these times may be a partial explanation. It is better, however, to take the two groups of causes together. There is less of a drop (2%) in the deaths from all cardiovascular causes than might have been expected from the fall of the population and the change of method in classification. The smallness of the decline may be due to the same reason as the rise in bronchitis. It is probable that, if the old

Table showing Mortality in London (Administrative County)

	Deaths from Certain Causes, 1929, 1930-9, and 1940*			Deaths in 1929 and 1940 compared with the Mean Annual Number of Deaths in 1930-9 taken as 1,000		
	Annual Mean			Annual Mean		
	1929	1930-9	1940	1929	1930-9	1940
All causes, less violence other than suicide	60,873	48,805	44,548	1,247	1,000	913
Influenza	3,118	908	537	3,433	1,000	591
Bronchitis	4,272	1,915	4,675	2,231	1,000	2,441
Pneumonia (all forms)	5,883	3,426	2,254	1,717	1,000	658
Other respiratory causes	879	515	755	1,705	1,000	1,465
Total influenza and respiratory	14,152	6,764	8,751	2,092	1,000	1,294
Cerebral vascular lesions	2,179	1,846	3,069	1,149	1,000	1,618
Other cardiovascular causes	15,273	15,554	14,064	982	1,000	904
Total cardiovascular	17,452	17,430	17,133	1,000	1,000	982
Nephritis	1,820	1,513	1,643	1,199	1,000	1,087

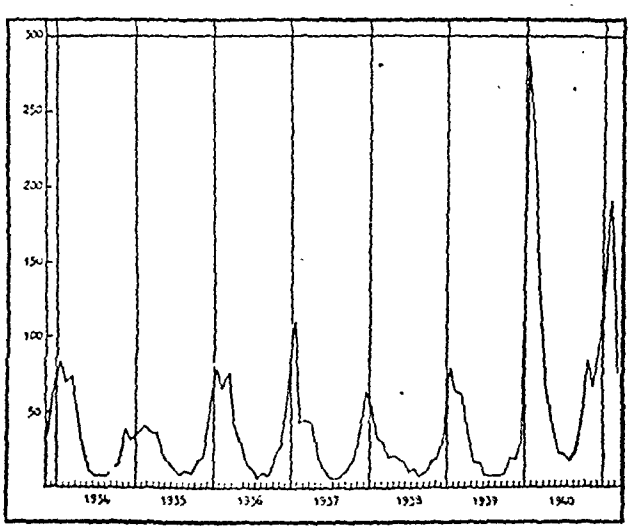
* Figures for 1939 and 1940 are the sum of the weekly returns, which do not coincide exactly with calendar years.

system of selection for classification had persisted, still more deaths would have appeared in the circulatory group and fewer as bronchitis, but that both would have shown an increase. Nephritis has declined substantially as compared with the average of the previous ten years; but this is part of a steady and quite rapid process over the years, and the figure for 1940 actually exceeded that for 1939 in spite of the fall of population. There is thus no evidence that bronchitis has borrowed materially from nephritis. This, like the other degenerative causes, may really have increased in 1940. The same comment applies to "old age,"* which has been figuring less and less in London statistics, but which nevertheless accounted for 226 more deaths in 1940 than in 1939. For purposes of classification it is still ignored as a cause if it is associated with any definite disease. The only other large category which showed a substantial decline was "other specified causes" (from 1,731 in 1939 to 1,229 in 1940, a difference of 502), but it is doubtful whether many of these would find their way to bronchitis by a change in the system of classification.

Discussion

The general conclusion from these considerations is that a large part of the increase of the deaths ascribed to bronchitis in the weekly returns for London in 1940 was fictitious, but that part of it was genuine. This part could not be attributed to influenza. It was associated with an increase, or less than the expected decrease, of certain other causes of death common among the elderly. Was it a result of war conditions?

The mortality from bronchitis, like other respiratory causes, and indeed like nearly all causes of death, has a definite seasonal distribution. Between 1921 and 1925 the average maximum for the whole country was in February and the minimum in August (Registrar-General's Review, 1925). In the chart shown here the average weekly number



London (Administrative County): average weekly recorded number of deaths over 45 years of age from bronchitis, in four-week periods, from November, 1933, to March, 1941.

of deaths over 45 years of age from bronchitis in London is given in periods of four weeks from November, 1933, to March, 1941. The comparison before and after the beginning of 1940 is valid, of course, only for seasonal occurrence and not in relation to its magnitude. It will be seen that the peak most often occurred in the first four weeks. In this respect 1940 conformed to type. In so far as there was a real increase in mortality from bronchitis, most of it was in the beginning of the year, before the people began to resort to shelters. The most notable feature of this season was the rigour of the weather. Unfortunately, meteorological records have not yet been published, but the weather in December, January, and February is known to have been exceptionally severe. Russell (1924, 1926) has drawn attention to the dominating effect of atmospheric temperature on respiratory mortality even in the absence of fog. The bitter weather at the beginning of 1940 was in itself probably enough to account for any increase in deaths from bronchitis and other causes among old people. If towards the end of the year shelter-life and exposure had any effect it was apparently not great, when the artificiality of much of the apparent increase is kept in mind. In 1941 the cold spell, severe but rather less so than in 1940, came later in the year, and the peak of bronchitis deaths was delayed till the second four weeks, when it was quite pronounced. It is, of course, possible that in both these seasons the effect of the black-out exaggerated the influence of the ill ventilation which always accompanies cold weather and favours respiratory infection; but the conclusion seems reasonable that the real part of the increase in mortality from bronchitis and other causes among old folks was mainly attributable to exceptional weather conditions and not to circumstances arising from war.

* Figures of old age are not included in the table because this heading did not appear in the short list till 1931.

Summary

There was a great increase of recorded mortality from bronchitis in London in 1940, affecting the elderly.

A large part of it was an artificial result of a change in the system of selecting one cause for classification from more than one cause stated in death certificates.

In so far as it was real it occurred mainly at the beginning of the year, as usual.

It was not due to an epidemic of influenza.

It occurred, probably along with an excess over the expected number of deaths of old people from other causes, during one of the most severe spells of weather this country has experienced, and should not be regarded as having been due to war conditions.

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The Royal New Zealand Society for the Health of Women and Children, which was founded by the late Sir Truby King, gives in its latest annual report some of the vital statistics of the Dominion. The birth rate in 1939 (excluding Maoris) was 18.73 per 1,000, the highest recorded since 1930. The maternal mortality rate, excluding septic abortion, was 2.95, and the infantile mortality rate 31.14 per 1,000 births, almost the lowest ever recorded. The death rate during the first month of life was 21.8, an improvement on the figure for recent years. The names and addresses of all infants who died during the year were obtained from the Registrar, and the Plunket nurses employed by the society investigated every case. An inquiry has also been made into the extent and duration of breast-feeding in New Zealand and the causes of early weaning, the outstanding one being failure of the milk supply of the mother. During the year further efforts have been made by the Plunket nurses to extend their pre-school work, and a ready response has been made by the parents. The society has six infants' hospitals in various parts of New Zealand, and the 138 Plunket nurses in its service saw 22,000 new cases during the most recent year, and paid 170,000 visits to homes.

THE BACTERIOSTATIC EFFECT OF DISINFECTANTS IN HUMAN SERUM AND CITRATED PLASMA

BY

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Although human serum is not a good medium for bacterial growth, bacteria will remain viable in it, and certain organisms will grow in it even at temperatures as low as 0° C. This is also true for reconstituted dried serum, so that bacterial infection is a potential danger in the use of reconstituted dried serum as a transfusion fluid—particularly since during the process of solution serum may become contaminated either through careless handling or by the use of non-sterile water in dissolving the serum. It is improbable that serum contaminated in this way would be a danger to the patient if it were used immediately after reconstitution, but if it were allowed to stand under bad conditions of temperature bacterial growth would take place. Therefore an attempt has been made to find a disinfectant which could be added to the serum before drying, or to the dissolving fluid, in a concentration that would be bacteriostatic and yet within the limits of toxicity even when large volumes of serum were transfused. At a later stage an experiment on citrated plasma was included.

During the course of the experiments it was found that *Staph. aureus*, *Micrococcus tetragenus*, and an enterococcus grew readily in serum from an original inoculum of 20 organisms per c.cm. Under similar conditions no growth of anthrax, streptococci of the "Oakley" strain, *Bact. aertrycke*, *Bact. shigae*, or *Bact. coli* could be demonstrated, while *B. subtilis* grew in serum after a preliminary delay during which the presence of living organisms could not be proved. The work was therefore carried out using *Staph. aureus*, *M. tetragenus*, *B. subtilis*, and an enterococcus as contaminating organisms in the serum. These organisms might reasonably be expected to be found as contaminants in stored serum or plasma, and members of the *subtilis-megatherium* group, micrococci, and pseudomonas have been isolated from serum received at this laboratory for drying.

A disinfectant to be used for the preservation of stored serum should be soluble enough to be added in a concentration that will not dilute the serum unduly. It must not react with serum proteins to alter their physical characteristics, and must be active as a bacteriostatic within the limits of toxicity of the drug even when large volumes of fluid are to be used. During the course of the experiments eight disinfectants were tried. These included four mercurials—merthiolate, metaphen, phenyl mercuric nitrate, and phenyl mercuric acetate; also proflavine, sulphanilamide, thymol, and *p*-chlor-*m*-cresol.

Effective Range of the Disinfectants

The effective range of concentration of each disinfectant was first determined. To 0.9 c.cm. of serum or reconstituted dried serum was added 0.1 c.cm. of a suitable concentration of disinfectant, depending on its solubility in water; from this mixture a series of falling dilutions was made in serum. In the case of metaphen four doubled dilutions were made, but with the other disinfectants four or five decimal dilutions were used, and of each dilution three tubes were set up. To each tube 0.02 c.cm. of a saline suspension containing 2,000, 200, or 20 organisms was added, and a control tube containing 1 c.cm. of serum without disinfectant was inoculated with each suspension. The tubes were incubated at 37° C., and growth was tested by making a stroke inoculation on an agar plate at intervals. Saline suspensions of bacteria were prepared by washing the growth from a twenty-four-hour agar slope culture and diluting with sterile saline until the suspension contained 1,000 million organisms per c.cm. measured by opacity. Dilutions of 1/1,000, 1/10,000, and 1/100,000 were made from this, and one drop from a fifty-drop pipette was used as an inoculum so that each drop contained 2,000, 200, or 20 organisms. The test organisms used in this series were *Staph. aureus* and *B. subtilis*.

Results of a typical experiment are shown in Table I, which indicates that 1/125,000 is the minimal concentration of phenyl

TABLE I.—*Phenyl Mercuric Nitrate: Three Days' Incubation at 37° C.*

Growth Medium	Organism — Inoculum	Dilution of Disinfectant 1/12,500	1/125,000	1/1,250,000	1/12,500,000	Control (no Disinfectant)
Filtered serum	Staph. aureus 20 c.cm.	−	−	−	−	−
	200 c.cm.	−	−	−	−	−
	2,000 c.cm.	−	−	−	−	−
Reconstituted dried serum	20 c.cm.	−	−	−	−	−
	200 c.cm.	−	−	−	−	−
	2,000 c.cm.	−	−	−	−	−

+, growth on subculture; −, no growth.

mercuric nitrate capable of preventing the growth of *Staph. aureus* in serum. The results for tests on the eight disinfectants are presented in Table II; the effect of size of

TABLE II

Disinfectant	Range of Dilutions Tested	Medium	Test Organism	Incubation Time (days)	Highest Dilution to Inhibit Growth
Metaphen	1 20,000 to 1 160,000	Reconstituted dried serum	Staph. aureus	1	1 80,000
				4	1 80,000
				6	1 80,000
		"	B. subtilis	1	1 160,000
				4	1 160,000
				6	1 160,000
		Filtered serum	Staph. aureus	1	1 40,000
				4	1 20,000
				6	1 20,000
		"	B. subtilis	4	1 20,000
Merthiolate	1 10,000 to 1 10,000,000	Filtered serum	Staph. aureus	1	1 100,000
		Reconstituted dried serum		6	1 100,000
				1	1 1,000,000
				6	1 100,000
Phenyl mercuric nitrate	1 12,500 to 1 12,500,000	Filtered serum	Staph. aureus	1	1 125,000
				6	1 125,000
		"	B. subtilis	1	1 1,250,000
				6	1 125,000,000
		Reconstituted dried serum	Staph. aureus	1	1 125,000
				6	1 125,000
			B. subtilis	1	1 1,250,000
				6	1 125,000,000
Phenyl mercuric acetate	1 10,000 to 1 1,000,000	Filtered serum	Staph. aureus	1	1 1,000,000
		Reconstituted dried serum		3	1 1,000,000
				1	1 1,000,000
				3	1 100,000
Proflavine	1 1,000 to 1 1,000,000	Filtered serum	Staph. aureus	1	1 100,000
				4	1 100,000
Thymol	1 2,000 to 1/2,000,000	Filtered serum	Staph. aureus	1	Growth in 1 2,000
		"	B. subtilis	1	Growth in 1 2,000
p-chlor-*m*-cresol	1 2,000 to 1 2,000,000	Filtered serum	Staph. aureus	1	1 2,000,000
		Reconstituted dried serum		3	1 2,000
				1	Growth in 1 2,000
				3	Growth in 1 2,000

inoculum has been neglected, since no gross differences could be demonstrated by varying the size of inoculum between 20 organisms and 2,000 organisms per c.cm. As is shown in Table II, the lowest concentration of disinfectant in serum which will inhibit growth has been determined.

Testing for Viable Organisms

In a second series of experiments an attempt has been made to see whether viable organisms were still present despite the absence of growth in the serum. So viable counts were

carried out on reconstituted dried serum inoculated with a suitable organism and incubated at 37° C. with the highest dilution of disinfectant which in the experiments described in the previous paragraph had been shown to inhibit bacterial growth. In this series the inoculum was always 20 organisms per c.cm

Method.—To 9 c.cm. of reconstituted dried serum made up to normal concentration 1 c.cm. of a suitable dilution of disinfectant was added so that the final disinfectant-serum mixture contained a dilution of disinfectant which had been shown to inhibit growth (Table II). Each tube was inoculated with 0.2 c.cm. of a saline suspension of bacteria, prepared as before, the final concentration of bacteria being 20 organisms per c.cm Control tubes containing 10 c.cm. of serum without disinfectant were inoculated with 0.2 c.cm. of the same suspension; the tubes were incubated at 37° C. Similar tubes were set up using citrated plasma as the growth medium for the bacteria. Viable counts were carried out by Miles's (Aitken, Barling, and Miles, 1936) " surface viable " technique after variable periods of time, but if growth in the serum-disinfectant mixture could be demonstrated at an early stage further counts were omitted. Three decimal dilutions were made in sterile saline, and a drop from a 50-drop pipette was allowed to fall on each of three marked places on an over-dried agar plate; each count is the average of three such drop areas containing a suitable number of colonies. Similar counts were carried out on control sera. As a routine the sera were inoculated with *Staph. aureus, B. subtilis,* and an enterococcus. Drop areas of *Staph. aureus* and enterococcus containing up to 60 colonies could be counted accurately, but the *subtilis* colonies were very large, and from 8 to 20 only could be counted. The results with this organism are therefore less accurate. The method of testing for viable organisms by plating from a ten-times dilution of the serum-disinfectant mixture was based on the assumption that by diluting the serum-disinfectant mixture ten times the concentration of disinfectant becomes low enough to allow inhibited but still viable organisms in the original disinfectant mixture to grow in the lower concentration. Thus serum containing merthiolate 1/100,000 inhibited the growth of *Staph. aureus,* but, on diluting, these organisms were able to grow. The dilution to 1/1,000 was made in order to get drop areas which would contain a countable number of colonies.

Results.—A summary of results is presented in Table III. In the case of merthiolate and phenyl mercuric nitrate (1/100,000) growth of bacteria could be demonstrated on diluting the serum-disinfectant mixture, so that fresh experiments were set up. Merthiolate was tried in a dilution of 1/10,000 because that dilution was already commonly used in the preservation of citrated plasma and was found to be effective in this concentration. Phenyl mercuric nitrate, except when the serum was contaminated with enterococcus, was effective in a concentration of 1/50,000.

Effects of Use of Disinfectants

Effect of Drying Disinfectant with Serum.—Sulphanilamide, metaphen, phenyl mecuric nitrate, and proflavine were added to the serum before drying, and the bacteriostatic power was estimated after reconstitution. So far as could be seen, freezing at − 20° C. and drying had no effect either on the bacteriostatic power of the disinfectant or on the solubility of the serum. Bacterial counts were also made on serum which had been made up to four times the normal concentration on reconstituting. Again no difference in bacteriostatic power of the disinfectant could be detected.

Effect on Pseudomonas pyocyanea.—In a bottle of reconstituted dried serum containing phenyl mercuric nitrate 1/10,000, from which a sample of serum had been taken with a chemically clean pipette for an osmotic pressure estimation, *Ps. pyocyanea* was found to be growing profusely. A loopful of this serum was added to serum containing 1/10,000 proflavine, and a loopful of a saline suspension of this organism was added to dried serum containing merthiolate, metaphen.

TABLE III.—*Growth in the Presence of Disinfectant*

Organism	Medium	Incubation Time (Days)	Control (no Disinfectant)	Sulphanilamide 1/5,000	Phenyl Mercuric Nitrate	Phenyl Mercuric Acetate	Metaphen	Merthiolate	Proflavine
M. tetragenus ..	Dried serum reconstituted to 4× normal	1	47,000,000	No growth					
		2	466,000,000	4,150					
		7	545,000,000	53,000,000					
Staph. aureus	" "	1	201,500	No growth					
		2	24,600,000	9,000					
		7	91,500,000	2,900,000					
B. subtilis	" "	1	5,000	No growth					
		2	2,500,000	"					
Enterococcus	Dried serum, normal concentration	1	210,000,000	1,800,000					
Staph. aureus ..	Dried serum, normal concentration	1	220,000				1/10,000		
		3	15,500,000				No growth		
		7	18,500,000				"		
B. subtilis	" "	1	No growth 1/100				"		
		3	450,000				"		
		7	60,000,000				"		
Enterococcus	" "	1	805,000,000				140,000		
					1/100,000	1/100,000		1/100,000	1/100,000
Staph. aureus .	Dried serum, normal concentration	3	200,000		No growth	2,000,000		17,800	No growth
		9	13,000,000		Growth +				512,000
B. subtilis	" "	3	130,000		200,000	No growth		2,000	No growth
		9	600,000			"			"
Enterococcus	" "	3	58,000,000		700,000	"		Uncountable 1/1,000	"
		9	10,000,000			"			Uncountable 1/1,000
					1/50,000			1/10,000	
Staph. aureus ..	Dried serum, normal concentration	2	1,800,000		No growth			No growth	
		7	10,500,000		"			"	
B. subtilis	" "	2	28,000		"			"	
		7	175,000					"	
Enterococcus	" "	2	210,000,000		115,000			"	
		7	20,000,000					"	
					1/50,000		1/10,000		
Staph. aureus	Citrated plasma	3	10,500	No growth	No growth		No growth	No growth	No growth
		8	8,300,000	10,000,000 (?)	"		"	"	"
B. subtilis	" "	3	No growth	No growth	"		"	"	"
		8	Profuse growth	"	"		"	"	"
Enterococcus	"	3	1,900,000,000	Uncountable 1/1,000	Uncountable 1/1,000		Uncountable 1/1,000	"	"
		8	43,000,000					"	"

and phenyl mercuric acetate, so that the final concentration was 1/10,000. Growth of the organism could be demonstrated in three days at room temperature. Apparently none of these disinfectants will control the growth of pseudomonas.

Effect on Moulds.—The inhibitory effect of proflavine and phenyl mercuric nitrate on moulds was tried in one experiment. A series of half dilutions of disinfectants was made in reconstituted dried serum from 1/10,000 to 1/160,000, and these were inoculated with a small amount of the vegetative form of an air-borne mould growing in serum broth. At room temperature growth took place in all dilutions of the serum containing proflavine, but was inhibited by 1/80,000 phenyl mercuric nitrate. There was no apparent difference in the tubes containing proflavine and in the controls.

Effect of Sulphanilamide in Serum and Blood.—Because of our inability to repeat the results of Novak (1939) one experiment was carried out on the lines suggested by Novak and Hunwicke (1940). Into twelve tubes 40 c.cm. of sterile citrated human blood was measured. Four were inoculated with a saline suspension of *B. subtilis*, four with *M. tetragenus*, and four more with *Ps. pyocyanea*. The suspensions were so adjusted that the blood contained 20 organisms per c.cm. Two tubes of each group were kept as a control, and to the others sulphanilamide was added, the final concentration being 1/5,000. One of each of the tubes containing organism and sulphanilamide, and its appropriate control, were held at room temperature, and the second set at 4° C. The blood was tested for bacterial growth after four days and seventeen days by smearing a loopful on the surface of an agar plate. After thirty days' incubation poured plates were made, those of the blood held at 4° C. with 1 c.cm., those held at room temperature with 0.1 c.cm. After four days at room temperature evidence of growth was obtained in the control tube containing *B. subtilis*, and after seventeen days growth in the tube containing *M. tetragenus* and *Ps. pyocyanea* was demonstrated. The plates poured after thirty days showed profuse growth of the bacteria in all tubes, and there was no obvious difference between those which contained sulphanilamide and the controls. With the exception of the control tube containing *Ps. pyocyanea* there was no growth in any of the tubes held at 4° C. After fifty-four days these tubes were incubated at 37° C. for three days and plates poured, using 1 c.cm. of blood as an inoculum. Profuse growth was observed in the plates from the control tubes, but there was no growth in any tube which contained sulphanilamide. Except that no growth of the controls could be shown at 4° C., these results corroborate those reported by Novak and Hunwicke.

Conclusions

As had been expected from Fildes's (1940) work the bacteriostatic power of mercurial disinfectants was considerably less in serum than in other media. Birkhaug (1930) has reported that metaphen in serum broth will destroy *Staph. aureus* in a dilution of 1/120,000. In serum a dilution of 1/80,000 allowed definite bacterial growth, and 1/40,000 proved only bacteriostatic—that is, bacteria would grow when the serum was diluted.

The efficacy of the individual disinfectants tried in these experiments appeared to depend entirely on the contaminating organism. *Metaphen* in a dilution of 1/10,000 inhibited the growth for six days of *Staph. aureus* and *B. subtilis* in serum, but enterococcus and *Ps. pyocyanea* grew in this concentration. Metaphen is soluble in dilute alkali (*p*H 9) in a concentration of 1/500, and does not affect the physical nature of the serum (Birkhaug, 1934; Hirschfelder and Wright, 1930). Bernstine (1929) has reported the intravenous injection of 10 mg. of metaphen without toxic effects. It will be observed, however, that the transfusion of 1 litre of serum would involve the injection of 100 mg. of the disinfectant.

Merthiolate had an activity of the same order as metaphen, except that no growth of enterococcus could be demonstrated in six days with a dilution of 1/10,000. This dilution did not prevent the growth of *Ps. pyocyanea*. Merthiolate is relatively non-toxic, and does not affect serum proteins (Powell and Jamieson, 1931).

Phenyl mercuric nitrate was effective against *Staph. aureus* and *B. subtilis* in a dilution of 1/50,000, but this dilution did not prevent the growth of enterococcus after six days, and 1/10,000 had no effect on the growth of *Ps. pyocyanea*. The growth of mould was inhibited by 1/80,000. The *p*H of the medium did not affect the bacteriostatic powers of this disinfectant. Drying the serum in the presence of 1/10,000 phenyl mercuric nitrate had no effect on the osmotic pressure after reconstitution (Adair, personal communication). Phenyl mercuric nitrate is reported to be less toxic than metaphen, which contains the same amount of mercury (Birkhaug, 1930). The chief objection to the use of this disinfectant is its insolubility in water, a saturated solution containing only 0.79 gramme per litre.

Phenyl mercuric acetate was tried because it was more soluble and would appear to be effective in a concentration of 1/100,000; but this concentration precipitated serum proteins.

Proflavine 1/100,000 prevented growth of *Staph. aureus* and *B. subtilis* for six days and enterococcus for three days. A concentration of 1/10,000 did not prevent the growth of moulds or of *Ps. pyocyanea*. Eggerth's (1926) observations on the effect of the hydrogen-ion concentration could not be repeated; proflavine was as active in plasma at a *p*H of 6.0 as in serum at a *p*H of 8.4.

Sulphanilamide proved ineffective in serum and plasma in inhibiting bacterial growth. Novak (1939) and Hunwicke (1940) have reported that 1/5,000 sulphanilamide would prevent the growth of organisms in stored citrated blood for twenty-one days. In serum from an inoculum of 20 organisms per c.cm. there is no growth of *Staph. aureus, B subtilis, M. tetragenus*, or enterococci for twenty-four hours after incubation at 37° C.; but after this time growth of all these organisms was observed and the degree of inhibition depended on the organisms. *Enterococci and micrococci grew readily* at 37° C., the count of micrococci increasing from 4,150 bacteria per c.cm. in two days to 53,000,000 in seven days. Control counts on serum without sulphanilamide during the same period showed a count of 466,500,000 in two days and 54,500,000 in seven days. At 4° C. serum which had become contaminated with *M. tetragenus* and had an initial count of 200 organisms per c.cm., after three days in the presence of sulphanilamide contained 5,500 organisms per c.cm., and after six days contained 45,000 bacteria per c.cm. Counts on serum without sulphanilamide increased from 4,350 bacteria per c.cm. in three days to 45,000 in six days. This serum had been held for some months at −20° C. Growth of *Staph. aureus* was inhibited to some extent by sulphanilamide. In serum inoculated with 20 organisms per c.cm. and incubated at 37° C. the count after two days was 24,000,000 organisms per c.cm. and 91,500,000 after seven days. Serum containing 1/5,000 sulphanilamide under similar conditions had a bacterial count of 9,000 bacteria per c.cm. in two days and 2,900,000 in seven days. It would appear, therefore, that sulphanilamide will inhibit the growth of organisms in serum for twenty-four hours but cannot be relied on for any longer period.

The results obtained when using citrated whole blood as a growth medium for the bacteria substantiate those previously described by Novak in human blood and by Hunwicke in horse and guinea-pig blood.

Thymol and *P-chlor-m-cresol* were shown to be quite unsuitable as serum preservatives: both allowed the growth of organisms in a dilution of 1/2,000, and caused the precipitation of serum protein

Discussion

From these experiments it would appear that disinfectants can have only a limited value in controlling the bacterial growth in stored serum. Of those tried the most effective was proflavine. In a concentration of 1/100,000 it prevented the growth of *Staph. aureus* and *B. subtilis* for six days and of enterococcus for three days. A dilution of 1/10,000 had no effect on *Ps. pyocyanea* or mould. From recent work (Albert *et al.*, 1938) it is evident that much higher concentrations are equally ineffective against pseudomonas. Higher concentrations of any of these disinfectants would not be practicable because of the danger of toxic reactions.

Bottles of serum sent by the Emergency Blood Supply Depots of the London region for drying in this laboratory

have been tested for sterility as they were received, and the results of these tests have been reported back to the depots. Some of the bottles have been found to be contaminated, and the number has steadily decreased as the depots have gained experience in the separation of the serum. As in no case was there any evidence of gross infection, and as the bottles are held at 4° C., at which temperature bacterial growth is slight, the infected bottles were pooled with the sterile ones during filtration. The majority of the contaminants were spore-bearing aerobes of the *subtilis* type, and Gram-positive cocci—either micrococci or sarcinae; pseudomonas was also isolated from serum and from stored citrated plasma. The necessity for filtration is evident, and from experimental results it is also evident that, although the contaminants of the *subtilis* type would be susceptible to the action of disinfectant, the Gram-positive cocci and pseudomonas would be resistant to its action, and the value of adding disinfectant to serum is doubtful.

While it is obvious that the correct procedure is to maintain conditions of absolute sterility during both the preparation and the solution of dried serum, and that the reconstituted serum should be used immediately, it is possible that in wartime reconstitution might take place under difficult conditions and it might not be possible to use the serum immediately. In such circumstances results would indicate that proflavine 1/100,000 and phenyl mercuric nitrate 1/50,000 would prevent bacterial growth for three days.

Summary

The effect of various disinfectants in controlling the growth of bacteria in serum, dried and reconstituted serum, and citrate plasma has been studied.

Growth of *B. subtilis* and *Staph. aureus* was prevented for six days by merthiolate 1/10,000, metaphen 1/10,000, phenyl mercuric nitrate 1/50,000, and proflavine 1/100,000. Growth occurred in sulphanilamide 1/5,000 after twenty-four hours.

Enterococcus was inhibited for three days by phenyl mercuric acetate 1/100,000, proflavine 1/100,000, and merthiolate 1/10,000. Growth in three days could be demonstrated in the presence of metaphen 1/10,000, phenyl mercuric nitrate 1/50,000, and sulphanilamide 1/5,000.

Ps. pyocyanea was not inhibited by any of these disinfectants.

Thymol and *p*-chlor-*m*-cresol were ineffective as bacteriostatics; and these and phenyl mercuric acetate precipitated proteins in serum.

Freezing at −20° C. and drying in serum did not affect the bacteriostatic power of metaphen, sulphanilamide, proflavine, and phenyl mercuric nitrate; nor did the presence of the disinfectants affect the solubility of the dried serum.

Moulds were inhibited by 1/50,000 phenyl mercuric nitrate but not by 1/10,000 proflavine.

Sulphanilamide will prevent the growth of *B. subtilis*, *M. tetragenus*, and pseudomonas in whole blood for thirty days at 4° C. but not at 22° C.

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The Foreign Department of the Reich Students' Administration announces (*Klin. Wsch.*, 1940, **19**, 1296) that more than 3,300 foreign students of both sexes are now enrolled in German universities. It is stated that no fewer than 65 countries of the world have sent delegates from their student youth to study in Germany.

LACTOSE FOR PREVENTION OF ODOUR IN THE CLOSED-CAST TREATMENT OF COMPOUND FRACTURES

BY

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The increasing use of the closed-cast method of treating compound fractures, particularly under wartime conditions, induces us to propose a means of preventing the foul odour that is one of its principal disadvantages. Our procedure, of which a more detailed account will be published elsewhere, has been devised in connexion with the treatment of osteomyelitis by the Winnett Orr technique. The application of that method to compound fractures has been well described by Trueta (1939).

Protein-sparing Effect of Carbohydrate

Briefly stated, it is our hypothesis that the foul odour which develops in these casts is the result of putrefaction, defined by Rettger (1928) as "anaerobic decomposition of protein with the formation of foul-smelling products characteristic of cadaveric decomposition." Autolysis of devitalized tissue probably helps to initiate this proteolysis by providing preliminary breakdown products which are more readily attacked by micro-organisms than are native tissue proteins. It seems likely that anaerobic bacteria play an important part in putrefaction. Trueta (1939) has noted the presence of anaerobes in the wounds under consideration. Whether these organisms arrive through the blood stream or by accidental implantation remains to be determined. On the basis of these assumptions, by implanting a sugar in the wound one may take advantage of the fact that most bacteria will attack carbohydrate in preference to protein when both are simultaneously available. As Kendall *et al.* (1913) have expressed it: "Fermentation takes precedence over putrefaction." It is when bacteria are utilizing protein for fuel rather than for merely structural requirements that foul products are formed. This principle is commonly referred to as the "protein-sparing effect of carbohydrate."

In selecting a sugar for use in wounds lactose was chosen instead of glucose because, since its molecule is larger (Kendall and others, 1913), a solution of it isotonic with the blood contains more sugar, and (Kendall, 1923) loss by absorption from the wound should be less. Since the first stage in the fermentation of lactose is the production of galactose and glucose, the latter becomes available for the relatively few organisms which cannot utilize lactose.

Method of Using Lactose

For clinical use we have arbitrarily chosen a 12% solution. Lactose of *U.S.P.* grade is dissolved in distilled water and autoclaved in quantities of about 50 c.cm. Sterile gauze dressings which have been dipped in this solution are placed in the wound instead of the usual vaselined gauze packs. A covering of dry gauze is employed to keep the sugar from contact with the plaster lest crumbling occur. In débridement the solution should be made and autoclaved within two hours of the time the water is distilled, as a precaution against the presence of spores. At subsequent re-dressings this precaution is unnecessary, since the granulation tissue is an adequate barrier against toxins (White, 1931).

We have employed this method in Winnett Orr casts for periods up to four weeks without the development of

a definite odour of putrefaction. For longer periods it is possible that larger amounts of sugar may be needed. These could be provided by increasing the concentration of the solution or by adding crystalline lactose to the dressings. With the use of lactose both the amount of exudate and the tendency to excoriation of the surrounding skin appear to be diminished, probably because bacterial production of proteolytic enzymes is decreased in the presence of utilizable carbohydrate (Kendall, 1923). The usual healing process does not seem to be impaired by the addition of sugar. The dressings do not become adherent to the wound as is sometimes the case with vaselined gauze. Since *B. pyocyaneus* has little or no ability to utilize sugar this method does not affect its odour, which, however, is not nearly so offensive and penetrating as that of true putrefaction.

It is to be hoped that the use of lactose will prove as satisfactory in compound fractures as it has in osteomyelitis.

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ACUTE DILATATION OF THE STOMACH

BY

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It is our intention, as the result of an unusual case of acute dilatation of the stomach, to discuss briefly the current views on this condition. Acute dilatation was described first by Kundradt in 1871, and was soon recognized and commented upon by other people (Fagge, 1873; Rokitansky, 1861). Rokitansky suggested that it was caused by the dragging of the mesentery of the small intestine, which pressed upon and occluded the transverse portion of the duodenum. This theory has persisted till recently, but it is surprising to find it still in modern textbooks. It is difficult to conceive how the occlusion of the duodenum can bring about acute dilatation of the stomach when the case described below is considered. Most of the reported cases follow operations, but there are many accounts of the disease arising apart from operation—e.g., during a severe wasting disease (Herrick, 1906)—and the condition has been known to occur in healthy individuals as the result of overeating (Gillette, 1930). It has also been reported following childbirth and severe blows to the abdomen.

Dragstedt and others (1931) state that acute dilatation is rare after operations upon the stomach itself, and we have considered it noteworthy to report a case following an operation of partial gastrectomy, as no such case could be found in the literature.

There are many peculiarities in respect of acute dilatation. The first striking feature is the enormous amount of fluid from the stomach: where does it come from? One opinion is that the stomach is able to hold all this fluid because it has become paralysed as the result of reflex sympathetic stimulation. The suggestion has been put forward (Morris, 1882-3) that the enormous amount of fluid was the result of excessive secretion of the stomach mucosa—in other words, a gastrorrhoea. Certain factors discountenance this theory. For instance, in our own case, in which a large part of the stomach had been removed, it is difficult to understand how the remaining portion could secrete 8½ pints in twenty-four hours. Again, if the fluid aspirated or regurgitated came from the stomach alone it would contain hydrochloric acid, but examinations of the fluid show it to contain little or no free HCl. It always contains bile (Herrick, 1906; Dragstedt and Dragstedt, 1922).

The present-day view considers that the dilatation is neurogenic and is the result of paresis of the muscles of the stomach. We suggest that the enormous amounts of fluid collecting in these cases arise from the alimentary canal below. As the result of the stomach becoming paralysed and dilated a negative pressure is produced in its interior. The intra-alimentary pressure where the muscular tonus is normal is higher than the intragastric pressure, and fluid flows backwards into the stomach—in other words, there is a backwash. The fluid keeps on collecting, and when enough is present it wells up into the oesophagus, rises into the pharynx, and is eventually expelled. This theory is supported by the fact that in these cases there is actually no true vomiting. The fluid which comes away just pours out from the patient's mouth. There is no sign of its being discharged in an expulsive manner. Once the condition has been started it is easy to understand why it should continue and how quickly the patient loses fluid. Not only fluid is lost but also valuable substances which are absorbed naturally lower down in the intestine and which are essential to retain the normal equilibrium of the blood. It is the loss of these valuable substances from the blood stream that is the real cause of death in these cases. There is no doubt that after operations acute dilatation of the stomach is of frequent occurrence in minor degrees, just as paralytic ileus is. It is difficult to understand why some cases should develop acute dilatation and others paralytic ileus. Fortunately these minor cases tend to right themselves. Factors which may make one suspicious that acute dilatation (or paralytic ileus) is developing are that the pulse rate is not lessening as expected after an operation, or that it is rising after having been lower for a short while. Or, again, the patient may complain of being uncomfortable under the bandages or show some uneasiness in his epigastric region. These cases should be met by passing a duodenal tube and leaving it in. This process of "sounding the stomach" is of the greatest assistance.

Case Report

The patient, a thin man aged 64, gave a history of abdominal pain in relation to meals for the last twenty years. He had noticed recently that his stools were often tarry. For the past six to twelve months vomiting had become more frequent and of greater volume; it relieved pain. A barium meal revealed great delay in emptying time. Gastroscopic examination showed chronic gastritis and pyloric stenosis, but no ulcer was seen. Occult blood ++ was found in the stools. A test meal disclosed a very high content of free acid.

The patient has had extensive medical treatment at other places, but without improvement. On January 31, 1941, a partial gastrectomy under spinal anæsthesia and gas-and-oxygen was carried out. A large-sized duodenal ulcer was seen. At the end of the operation the patient's condition was satisfactory: the pulse had fallen from 120 to 100. Twenty hours after the operation the pulse rate began to rise slowly, though the patient was comfortable and did not complain of symptoms. Thirty hours after operation the pulse rate had risen to 120 and he had a feeling of distension in the epigastrium. At this time he spat out 2 oz. of dark brown fluid which he said "just came up into my mouth." Acute dilatation was suspected, and the stomach was sounded by means of a Ryle tube. 30 oz. of fluid was aspirated. A continuous gastric drainage apparatus was set up and an intravenous drip was started. Morphine grain 1/4 four-hourly was administered, and the bed was raised two feet at the bottom. Within twenty-four hours from beginning the aspiration 8½ pints of fluid were withdrawn and the pulse came down to 80.

Summary and Conclusions

A case of acute dilatation of the stomach following a partial gastrectomy is described. In view of this condition following a partial gastrectomy the previous theory of compression of the third part of the duodenum by the mesentery is proved to be wrong.

The present theory that acute dilatation is neurogenic in origin is one which is now accepted. We have come to consider that this condition and paralytic ileus are very closely related, the only difference being that one is a pathological state of the stomach and the other a pathological state of the alimentary canal lower down. A theory as to the origin of the large amount of fluid expelled is given.

The value of "sounding the stomach" in the early stages of the condition is stressed.

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Clinical Memoranda

Capillary Fragility and Vitamin C in 40 Children of Different Classes

By dietary experiments on a man and a woman whose capillary resistance to rupture was initially normal Göthlin (1937) was able to show that subsistence on a diet poor in vitamin C gradually gives rise to capillary fragility. The change proved to be reversible, for with increasing doses of fresh orange juice the strength of the cutaneous capillaries returned to normal. In 1931 Göthlin found that 5.9 to 21.5% of his children gave a positive capillary resistance reaction. In all cases their diets were deficient in vitamin C. He gave these children 60 to 120 c.cm. of orange juice a day, and yet only 50% of them showed any definite rise of capillary resistance. From this he concluded that although lack of vitamin C was a definite factor in lowering the capillary resistance there were other factors to be considered. In 1935 Dalldorf and Russell investigated a series of 24 persons with subclinical scurvy. They injected 100 mg. of ascorbic acid in 21 cases and 50 mg. in 3 cases. All showed an immediate rise of capillary resistance between 10 and 20 mm. Hg. using Dalldorf's technique. Since then St. Rusznyák and Szent-Gyorgyi (1936), and Scarborough and Stewart (1936) have suggested that vitamin P (hesperidin) was responsible for increased capillary fragility; but that has been disputed by Zilva (1937).

THE INVESTIGATION

To discover the relation of capillary resistance to vitamin C and to investigate this difference in various social groups we studied the capillary fragility of 40 unselected healthy children. The method adopted was a modification of Bell, Lazarus, and Munro's (1940) adaptation of Göthlin's test. This modification was necessitated by the small size of the children's arms. A circle 6 cm. in diameter was made on the anterior cubital fossa; the skin on the area was examined, and any blemish resembling petechiae was marked on the skin. The subject was seated in a chair with the arms resting on a table at the level of the heart. The longitudinally folded band of a sphygmomanometer was wrapped round the upper arm, the lower edge of the bag being kept at least half an inch above the circle. Pressure of 50 mm. Hg was maintained for fifteen minutes. After the skin had returned to its normal colour petechiae in the circle were counted by each of us independently, and the average taken. A 300-watt lamp, two feet from the arm, was used for the inspection of the cubital fossa, and the room was kept at a comfortable temperature. Several of the normal children were tested on two separate occasions, but the results at both times were practically identical.

As Göthlin (1931) and Bell *et al.* (1940) have shown, over eight petechiae in the circle represent a definite increase in capillary fragility.

Results.—A total of 40 unselected healthy children between the ages of 1½ and 6 years were examined. Class A were 10 children from a private school; Class B were 20 children from the poor quarters of Newcastle-upon-Tyne; and Class C 10 children from a day nursery. Therefore the nutrition of Class A could be considered as excellent, of Class B poor, and of Class C intermediate, as the children of this class obtained better food than Class B whenever they attended the day nursery.

TABLE I.—*Distribution of Children according to Number of Petechiae in the Circle shown at the First Test*

	No. of Petechiae												
	2	3	4	5	6	7	8	9	10	11	12	13	14
Class A (10)	—	2	1	4	1	1	1						
,, B (20)	1	1	2	2	2	3	3	2	—	—	2	1	1
,, C (10)	1	3	1	1	2	—	—	—	2				
Total (40)	2	6	4	7	5	4	4	2	2	—	2	1	1

TABLE II.—*Result of Administration of Ascorbic Acid in the 8 Children with Initial Increased Capillary Fragility*

Initial Petechial Count	Petechial Count After Treatment for 1 Week	Petechial Count After Treatment for 2 Weeks
13	4	—
14	11	7
9	6	—
12	4	—
12	5	—
9	4	—
10	5	—
10	4	—

Table I shows that 8 of the 40 healthy children had a definite increase in fragility of the capillaries. These 8 children were re-examined for capillary fragility after the administration of 100 mg. of ascorbic acid (redoxon) daily for a period of one week. Table II shows that after the administration of ascorbic acid all the 8 children were definitely improved, the capillary resistance being normal to 7 out of 8. To the one child who still had abnormal fragility, ascorbic acid 100 mg. daily was given for a second week, after which she showed normal capillary resistance. All children of Class A had normal capillary resistance; while in 33% of Class B and 25% of Class C it was definitely increased.

DISCUSSION

This series shows that capillary resistance to pressure is greatly affected by vitamin C, and that the abnormal fragility of the capillaries can be improved by the administration of ascorbic acid in sufficient doses. The capillary resistance is normal in healthy children of the better classes, and it decreases as the diet deteriorates. This fact may suggest that nutrition, and probably vitamin C, play an important part in capillary fragility.

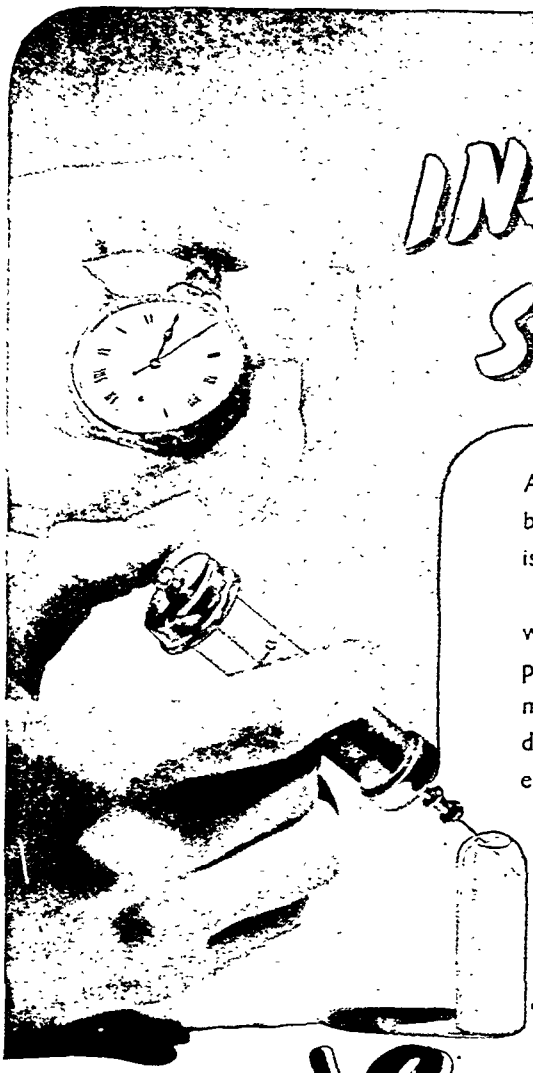
If the capillary resistance test can be considered to be an index of the amount of vitamin C sufficiency or deficiency in the healthy children, then our results compare favourably with the findings of Prof. Harris (1940) in Cambridge children, as determined by his methods of urine analysis. The capillary resistance test may therefore have great scope in the assessment of adequacy in routine school medical examinations.

We are grateful to Dr. A. J. Smith for his generous help in this work.

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INSTANTLY SOLUBLE

An intravenous anæsthetic should not be administered until, in solution, it is water white and clear.

The addition of sterile distilled water to 'Evipan' Sodium immediately produces a clear bright solution, which may be given intravenously without delay and without fear of local ill-effects.

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Reviews

CAUSAL MECHANISMS OF DEVELOPMENT

Organisers and Genes. By C. H. Waddington, Sc.D. (Pp. 160. 12s. 6d. net.) Cambridge: The University Press. 1940.

For at least twenty years the need has been felt for a synthesis of the results of genetic and embryological experiments. Genetics alone remains formal, a science of ratios, a schematic representation of certain aspects of reproduction and hereditary transmission. Embryology alone remains, for the most part, descriptive, lacking the fabric of ordered hypothesis and theory. The present book will therefore be welcomed as a praiseworthy effort to present "a general framework for our ideas on the causal mechanisms of development." The aspect of embryology particularly considered is that of embryonic induction, about which knowledge has increased rapidly in recent years; a field, moreover, in which Dr. Waddington has himself made notable contributions. The reader who is unfamiliar with this subject will find himself on ground which is far from easy, and may at first feel bewildered by the complexities of evocation, individuation, competence, and the like. Similarly, the reader whose knowledge of genetics is slight will face a stiff task, though here, too, the argument, if closely reasoned and condensed, is clear. Careful reading is required, but will repay the effort. Many will doubtless feel some disappointment that more has not been accomplished, that more cannot be said. It should be emphasized, however, that the fault, if it is a fault, is not that of the author. He has presented a thoroughly able thesis, and one which is complete and up to date. A synthesis has been attempted, and with success, but it is clear that, if the foundations have been truly laid, future years will see much greater advances than those already made.

The reader is urged not to look at the frontispiece, entitled "The Epigenetic Landscape," till he has read page 93. We had no one to give us this advice, and kept turning back only to be baffled again and again; and to be reminded of some lines of unhappy inspiration that once called down the thunderbolts of Macaulay:

> "The soul, aspiring, pants its source to mount,
> As streams meander level with their fount."

After all this the sentence on page 93, "It would be difficult to find a similar configuration in any actual piece of country," seemed a masterpiece of understatement. If the reader, however, curbs his impatience he will be rewarded with a not unhelpful similitude and will spare himself, as we did not, a considerable headache.

GASTRIC AND DUODENAL ULCERS

Gastric and Duodenal Ulcers. By Harold Avery, D.Sc., M.B., M.R.C.P. (Pp. 110; illustrated. 7s. 6d. net.) London: John Bale and Staples, Ltd. 1941.

This book, according to the author, was written because of the difficulty of finding concise information on the subject of gastric and duodenal ulcer in a single volume. Unfortunately, the fifty-three small pages in the book which are devoted to symptoms, diagnosis, and treatment give no more satisfactory information than that provided by several textbooks on general medicine. There are neither references nor bibliography—a serious omission from a monograph, however small.

The book opens with a badly illustrated account of the anatomy and physiology of the stomach. This is followed by a short chapter on the pathology of ulcer, illustrated by four deplorable sketches. After an account of the aetiology a short description of the clinical history is given. The chapter on clinical examination, including radiology, is accompanied by only two radiographs, neither of which is very good. The chemical, but not the more accurate spectroscopic, methods of examining for occult blood are described, and the necessity for eliminating chlorophyll from the diet is not mentioned.

Dr. Avery does not appear to have any decided views on the subject of treatment. He gives prescriptions for three different alkaline powders without indicating under what conditions each should be used. The dose of tinct. belladonnae is given as 5 minims, which is too small to have any effect on secretion or motility in the majority of cases, and the hypodermic injection of grain 1/75 of atropine at night is recommended, though atropine can be equally well given by mouth. The author has an unfortunate liking for proprietary preparations of doubtful value, and he recommends the quite unnecessary addition of copper and manganese to iron in the treatment of anaemia. The advice that transfusion should be given, in cases of haemorrhage requiring surgery, only after the bleeding-point has been secured will not be shared by many surgeons, who naturally prefer that the patient's haemoglobin should be brought to a safe level before beginning the operation.

In discussing hour-glass contraction the four physical signs collected by Moynihan in 1904 are described, although in practice they were found useless in the days before the x rays rendered the search for signs superfluous. Dr. Avery states that blood from a duodenal ulcer is rarely vomited—an extraordinary statement in view of the fact that duodenal ulcer is the commonest of all causes of haematemesis.

THE EYE IN MEDICO-LEGAL PRACTICE

A Treatise on Medicolegal Ophthalmology. By Albert C. Snell, M.D. (Pp. 312. 30s. net.) St. Louis: The C. V. Mosby Company. 1940.

No monograph has been published in this country on the medico-legal relations of the ophthalmologist; and indeed the general practitioner of medicine or law might find it difficult to imagine what would fill a fair-sized book on this subject. He might guess correctly that the matter would practically all be concerned, directly or indirectly, with compensation, chiefly of injured workmen and secondarily of persons injured by negligence or malice, or of candidates for pensions. Even in that restricted field Dr. Snell shows how large the subject is. His first three chapters, it is true, deal with general law—the position of the medical witness, the legal duties of a physician, and the law relating to negligence. He also traces the historical development of liability and compensation laws in America, and the laws relating to vision which have been passed both by the Federal legislature and by the various States. The middle section of the book, which is his individual contribution to the science of forensic ophthalmology and perhaps its most important part, deals with the evaluation of visual disabilities and the determination of fractional parts of vision. Acuity notations, of course, are not expressions of fractional parts of vision, and the fractional form of recording acuity of vision devised by Herman Snellen in 1862 and now in universal use does not represent the remaining fraction of the normal vision.

Dr. Snell summarizes the various attempts that have been made to estimate visual function and points out their drawbacks. The problem has been extensively studied in the United States, especially by the Section of Ophthalmology of the American Medical Association, and Dr. Snell reprints the report of its committee on compensation for eye injuries. This sets forth a method of appraisal

of visual efficiency which has been accepted as a standard by nearly all American ophthalmologists, and he recommends its more general use in order to secure a greater degree of uniformity among the various States in computing indemnity for visual disability. Other chapters of this elaborate study are devoted to examination of injured eyes, malingering, and suggestions for the improvement of the compensation laws. For the English reader about half this book is irrelevant, as it deals with American law and procedure. The other half, however, is obviously of great value. The workmen's compensation laws of the two countries are sufficiently alike to make the general practical purpose of the book applicable here, and the medical rather than the legal side should greatly assist ophthalmologists who have much insurance practice.

COMMUNITY HYGIENE

Community Hygiene. By Elizabeth Sterling Soule, R.N., M.A., and Christine Mackenzie, R.N., M.A. (Pp. 218. 7s. 6d. net.) New York: The Macmillan Company. 1941.

Professor Elizabeth Soule and Instructress Christine Mackenzie of the University of Washington present in their recently issued book entitled *Community Hygiene* a brief but well-informed survey of public health activities in the United States to-day. Among the chapter headings are Food Control, Water Supply, Sewage Disposal, Housing, Communicable Diseases, Maternity, Infancy and Childhood, and Industrial Hygiene. We have found no errors in what is said, and no omission of significance. The important points are well brought out, and the style of writing is lucid and graceful. Though it modestly claims to be but a manual for student nurses at Washington, *Community Hygiene* is well worthy of a wider circle of readers, even including students and practitioners of medicine on this side of the Atlantic, many of whom might derive an enhanced appreciation of the aims and achievements of hygiene from this pleasant book.

Notes on Books

The ninth edition of *Bainbridge and Menzies' Essentials of Physiology*, edited by H. Hartridge, M.D., F.R.S., is published by Longmans, Green and Co. at 16s. This book is popular with students on account of its small bulk. On that account also its style is brief to the point of dreariness. Much recent matter has been included in the present edition, but some obsolete matter is still to be found, and certain important new items have been omitted. For instance, under the functions of the adrenals, the now discarded view of the failure of respiration after adrenalectomy is not only mentioned but supported by a figure in the text. Yet under the same heading there is no mention of the now well recognized and clinically employed cortical steroids. Misspellings, such as that of "phosphorelation" for "phosphorylation" on the same page, are frequent (e.g., "odenyl" for "adenyl" on p. 543). There are numerous instances of loose or inaccurate statements throughout the book, and most of these are to be attributed to the extreme compression to which the matter has been subjected. Some new figures have been introduced, and these are clearly drawn; it is a pity there are not more of them, and either a less ambitious text or a fuller exposition throughout. The general get-up of the work is excellent, and the index adequate.

Modern Treatment in General Practice Year Book 1941 is edited by Mr. CECIL P. G. WAKELEY, who writes a preface, and it is a collection of short miscellaneous papers on therapeutics reprinted from the *Medical Press and Circular*, which publishes the volume at 12s. 6d. from the office of Baillière, Tindall and Cox. The first and larger part of the book is made up of thirty-one signed contributions on subjects ranging from haematemesis to dental cysts. The concluding section comprises twelve signed articles grouped together under the heading "War Medicine and Surgery." Some of the articles are illustrated, and there is an index.

Mr. ALECK BOURNE'S *Synopsis of Obstetrics and Gynaecology*, first published in 1913, has now reached an eighth edition (John Wright and Sons, Ltd., 15s.). The general plan is maintained, but the text has undergone a good deal of revision and some parts have been largely rewritten. There is a new section on post-natal care. In his preface the author expresses the hope that this book may still be helpful to students for revision and to practitioners as a means for quick reference. We think it will.

Preparations and Appliances

TROCAR FOR INTRODUCING REINFORCED MALECOT OR DE PEZZA TUBE THROUGH THE BLADDER WALL

Mr. H. P. WINSBURY-WHITE, F.R.C.S. (London, W.1) writes:

The trocar illustrated herewith is really a modification of the instrument made some years ago for the late Frank Kidd. The point of the trocar is passed down the tube and made to perforate the central reinforced button at the vesical end of the former. After the distended bladder has been exposed

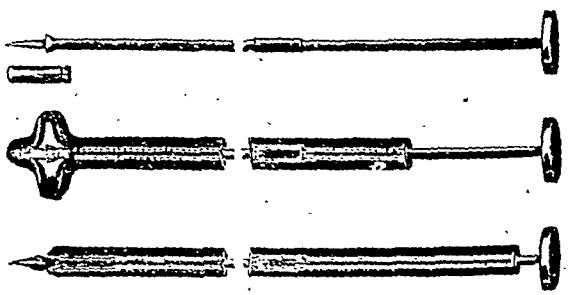


FIG. 1.

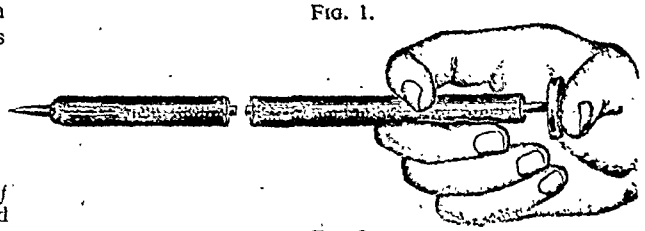


FIG. 2.

the tube is put on the stretch with the fingers and thumb as shown in Fig. 2. The point of the trocar and adjacent part of the tube are then forced firmly through the exposed bladder wall. The trocar is next quickly withdrawn while the tube is held securely just outside of the bladder. This form of trocar can be disengaged from the tube more quickly than the old pattern instrument; thus a minimum amount of fluid is allowed to escape.

If gradual decompression of the bladder is necessary, the tube is spigoted as soon as the trocar is withdrawn. As the tube is on the stretch when it is introduced, it re-expands the moment it is released and in this way makes a completely watertight junction with the bladder wall, so bringing decompression under complete control. Because of its length the trocar is made in two equal parts which unscrew for convenience in travelling and sterilizing.

The instrument has been made for me by the Genito-Urinary Manufacturing Company of London.

ASCORBIC ACID FOR INFANTS

British Drug Houses Ltd. now supply tablets of vitamin C for infants, so as to provide ascorbic acid in a convenient form and thus counter the shortage of oranges. Each tablet contains 5 mg. of pure vitamin C and is equivalent to about two teaspoonfuls of orange juice. It dissolves readily in warm milk or in the infant's feed. The tablets are put up in bottles of fifty.

BRITISH MEDICAL JOURNAL
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SATURDAY MAY 17 1941

NOTICE TO READERS

To-day's issue of the BRITISH MEDICAL JOURNAL *has been prepared and passed for press under conditions of very great difficulty brought about by exigencies of war. Readers and contributors are asked to overlook imperfections in the* JOURNAL *as now printed in a different type-face, and to understand that much current material is perforce missing.*

It may now be stated that British Medical Association House suffered severe damage in one of the recent air raids on London; but work continues in all the departments.

ENDOCRINE INTERACTIONS

When Claude Bernard, from his study of the glycogenic function of the liver, first formulated the conception of internal secretion as a process by which the constancy of the internal environment was ensured, the real profundity of his generalization was not fully appreciated. Yet every subsequent advance in endocrinology has borne it out, and Dr. W. Cramer[1] has reviewed and added to our knowledge of this balance. He regards the endocrine glands as functionally one system consisting of a number of interacting units, in much the same way as Aschoff regarded various groups of cells in different organs as forming a coherent reticulo-endothelial system. The former is, however, much more varied in its responses, for some of its members are synergists and others are antagonists. If one of these glands is stimulated the internal environment is altered, and in order to restore the balance there is a secondary compensatory response in other glands, the antagonists being stimulated and the synergists inhibited. When the primary change is an inhibition or dysfunction the compensatory response is in the reverse direction—that is, antagonists are inhibited and synergists stimulated.

After showing how completely this idea is exemplified by recent knowledge concerning the classical example—that of the glycogenic function of the liver—Dr. Cramer goes on to elaborate it in connexion with the sex hormones. Prolonged experimental oestrinization gradually induces a syndrome resembling Simmonds's disease, yet the anterior pituitary is enlarged and deeply congested, while histologically it approaches the appearance of a chromophobe adenoma. This can be explained only by the supposition that the oestrogen arouses the anterior pituitary to a compensatory reaction which it nevertheless antagonizes and overcomes. That this is the true explanation is shown by the failure of the Simmonds syndrome to appear if oestrogenic and anterior pituitary hormones are injected simultaneously. On the other hand, the effect on the adrenal cortex of prolonged oestrinization is a specific degeneration of the innermost zone of the cortex, which on the view that the ovary and the adrenal cortex are synergists is what would be expected. It is further supported by the fact that if oestrinization is started a few weeks before adrenalectomy is performed in mice the mortality after operation is greatly diminished. Moreover, Woolley and others[2] found that spayed mice developed massive hyperplasia of the adrenal cortex. Thus hyperfunction of one gland leads to hypofunction of its synergists, and vice versa. On similar lines he attributes status lymphaticus to adrenocortical hypofunction. The adrenal medulla, though much less active in this connexion, appears to be antagonistic both to its own cortex and to the ovary. Cramer develops an interesting speculation based on these observations as to the influence of the synergist ovary and adrenal cortex on the development of mammary cancer, and of the antagonist anterior pituitary and adrenal medulla on mammary involution. He maintains, however, that the therapeutic value of the oestrogenic hormones is so high that their use should not be discredited on this account, as there is no risk of inducing cancer thereby so long as they are given over short periods of several months in doses just sufficient to produce the desired therapeutic effect. From a study of its effects on other glands he is of opinion that the follicular hormone embraces a wider range of endocrine activities than that of any other single hormone, in which respect it is in striking contrast with the male hormone testosterone, in spite of the close chemical similarity between them. An excessive supply of testosterone does not produce any of the effects on the pituitary and adrenal cortex which can be induced by very small doses of oestradiol, though, on the other hand, castration leads to some degeneration in the anterior pituitary (which disappears when testosterone is given) and degeneration in the adrenal medulla.

Dr. Cramer will not allow that the anterior pituitary is "the leader of the endocrine orchestra,"[3] considering that the pituitary is deeply influenced by the female member of that orchestra. (Presumably, then, the pituitary is more independent in men.) But this ignores not only the evidence for the dominant position of the pituitary adduced by Prof. E. C. Dodds in his Goulstonian Lectures in 1934 but the whole question of the part played by the autonomic nervous system. On that all he has to say is, "There is abundant evidence that the functional activity of some endocrine organs affects the mind and can in turn be affected by the mind." Now *a priori* one would hardly expect that, after the nervous system had succeeded in imposing increasing control over increasingly complex organisms as they evolved, it would abdicate in favour of chemotropisms. No doubt there is an autonomous ebb and flow of endocrine activity according to immediate biochemical requirements, but the blending of neural and glandular structures alike in the pituitary and adrenal in itself suggests some nervous control. The basal ganglia are the seat of emotional expression, and the pituitary-hypothalamic apparatus is now regarded as a unit where nervous mechanisms can be transformed into chemical ones. Moreover, the hypothalamus is also generally considered to be the head ganglion of the sympathetic, so that there is another route by which the emotions may influence the endocrine system, as they undoubtedly do. Now that we know, thanks to Dale and to Loewi, that this translation of nervous activity into chemical mechanisms occurs at every nerve-ending throughout the body, we may fairly

[1] *Bull. N.Y. Acad. Med.*, January, 1941, p. 5

[2] *Proc. Soc. Exper. Biol. & Med.*, 1939, 25, 277.

[3] Laughton-Brown, W., *Harveian Oration*, 1935, Camb. Univ. Press.

apply it to the endocrine system. Indeed, we may view it as integrated through the autonomic nervous system, and if the pituitary is the leader of its orchestra the hypothalamus is its conductor. This is not to deny the value and interest of Dr. Cramer's paper, which may be read in conjunction with Dr. P. E. Smith's article[4] on the relationship of the anterior pituitary to the other endocrine glands. This is an admirable review of our present knowledge which, while admitting the principle of antagonisms, does not dethrone the pituitary in favour of a matriarchal system. He also lays stress on a very important though neglected aspect—the selective capacity of the end-organ to respond to a hormone, which must play an essential part in the action and interrelations of the endocrine glands. As yet we know hardly anything of the nature of this selective capacity.

MEASURING GENIUS

More than thirty years ago Prof. Terman[5] became interested in the problem of what highly gifted persons are like during their early life. He perceived that the techniques of mental testing then being perfected offered the opportunity of attacking the question in the reverse way also. Using the new methods it became possible to select groups of children of the highest performance and then to follow their subsequent history. Preliminary observations along both lines soon convinced him that traditional beliefs on the subject were often little more than hallowed superstitions. Thorough investigation was certain to prove very expensive, but by great good fortune the genius of Prof. Terman found its complement in the generosity of the Commonwealth Fund, and twenty years ago there was initiated a scheme of research which for brilliance of conception, for thoroughness of execution, and for the fruitfulness and fascination of its results can seldom have been surpassed. It is to be hoped that many more volumes will be added to that fine series, *Genetic Studies of Genius*, in which the results are being recorded.

The first task of the Stanford workers was to select the most gifted Californian children of their time; these numbered 1,300—about 0.5% of the population. The physical and mental characteristics of the children composing the group were described in exhaustive detail in the first volume to be issued by the Stanford University Press.[6] The essential part of the plan was, of course, to re-examine these individuals at intervals and to discover what they were making of their lives. It is a fortunate circumstance that an outcry about inquisitorial and prying methods, that Press-fed menace to the betterment of human beings by research upon themselves, is likely to be least in evidence when the circumstance which has attracted the notice of the investigator is the extreme brilliance of the subject. Also, no doubt, comparative freedom from such prejudices is one of the blessings of a new country. In any event Prof. Terman, after the lapse of nearly twenty years, is still in touch with more than 95% of his group. The first re-examination took place after two years; a very comprehensive re-examination after six years filled another volume. Now we hear of a follow-up after more than fifteen years, the median age of a younger group being 27 years and of an older group 33. To the question whether the intellectual superiority of the group has been maintained, Prof. Terman says that the answer is emphatically yes. But the careers of the subjects have differed widely. At one extreme we hear of outstanding successes in various fields, and a flood of books and papers in learned journals; at the other extreme there are many who occupy humble positions.

What factors influence the translation of native intelligence into achievement and eminence? The advocates of sex equality will be sad to learn that sex is still an enormously important factor. Even if she does not marry the highly gifted girl tends to "accept whatever kind of respectable employment is at hand." So much is this so that the analyses now to be mentioned apply to the men only. Two groups were selected—A and C, the top and bottom 25%. The criterion, carefully applied, was the extent to which the individual had made use of his gifts: 90% of the A's graduated from college, only 50% of the C's; 96% of the A's were professionally or semi-professionally employed, only 28% of the C's. One important difference lay in the home background. There was a tradition of education in A homes. In line with this it was found that the heavy pressure to succeed in Jewish families ensured more accomplishment per unit of intelligence than was found in any other racial stock. Another very interesting distinction lay in the greater emotional stability of the A's; and a most important point is that it can now be seen that this difference was already detectable in the young child. No doubt as a consequence of this difference the A's marry younger, marry better, make better marital adjustments, and divorce is three times less common than among the C's. Already 300 children of these gifted persons have been tested and yield a mean intelligence quotient of 127, as compared with 150 for the group itself. It is striking that at these extreme levels the regression coefficient should still be in the neighbourhood of 0.5.

There is no space to refer to the other and fascinating aspect of these investigations—historical studies of 300 of the most eminent persons in history. But one most instructive point must not be omitted. Prof. Terman states that he was led to appreciate the importance of sound psychology in biographical studies and to apply for funds for this research by a striking piece of erroneous interpretation on the part of no less gifted and acute an observer than Karl Pearson. Pearson in his biography of Galton stated that the latter learned to read at the age of 2½ years, wrote a letter before he was 4, at 5 could read almost any English book and some French, could do any sum in addition, knew English money, and could tell the time by the clock. Pearson merely concluded: "I do not think that we can say more than that Francis Galton was a normal child with rather more than average ability." It can safely be concluded that his intelligence quotient must have been in the neighbourhood of 200, a level that not more than one person in 50,000 could attain.

In his conclusions Prof. Terman is commendably cautious; some of his more important generalizations are as follows. The typical genius is not an indomitable spirit driving on a frail body; he is healthy above the average. The typical genius is not one

[4] *J. Amer. med. Ass.*, 1940, 115, 1991.
[5] *Science*, 1940, 92, 295.
[6] *Genetic Studies of Genius*, vol. i, by L. M. Terman and others, 1925. Stanford University Press.

whose astonishing talents are confined to a single narrow interest and who is stupid at everything else ; he is highly versatile and capable of achieving success in many fields. The typical genius is not as a child the fool of the family, developing late, much to the amazement of his parents, nurses, and teachers: he displays his high gifts as soon as they can be observed and measured ; the typical genius is not a frustrated miserable being frenziedly dragging forth his gifts to mankind from the blackened recesses of a tortured soul: he is well adjusted, cheerful, happily married, and devotes himself contentedly to his work, his hobbies, and his home. Thus Prof. Terman. But there remains the difficult problem of how we should define the word "genius," a problem which of course he has not shirked. Perhaps it may yet be found that the very extremes of human achievement may not infrequently be associated with physical disability or mental unbalance—it is not hard to recall individual instances—but Prof. Terman appears to have produced very weighty evidence to the contrary when the criterion is measurable mental ability of a very high order, or when it is eminence which is extreme without perhaps being superlative.

SULPHONAMIDES FOR LUPUS ERYTHEMATOSUS

H. W. Barber, in an excellent and interesting paper,[1] shows that lupus erythematosus is often amenable to treatment with the sulphonamides. It is true that, by the employment of the heavy metals, considerable progress had been made in recent years with the therapy of lupus erythematosus. Both gold and bismuth have proved their value in dealing with it, but the results are by no means always satisfactory, and on that account alone a new line of approach to treatment is welcome. Barber has always been of opinion that lupus erythematosus must be regarded, not as a definite disease having always the same aetiology, but as a form of clinical reaction to various infective agents. He considers the streptococcus to be prominent among these, though he admits that the tubercle bacillus may in some cases be the root of the evil. He has always insisted on the importance of the removal of all obvious septic foci in streptococcal cases, and in cases of comparatively short duration the results are often very good. He admits disappointment, however, in cases of long standing. The failure, he thinks, is due at least partially to the existence of subsidiary foci not accessible to surgical removal. He believes that by the use of the sulphonamides he can attack the entrenched bacillus in situations otherwise impregnable, and the clinical cases which he quotes strongly support his contention: he has used sulphanilamide and sulphapyridine, the latter most often. A characteristic reaction appears about eight to ten days after starting treatment with these compounds, consisting of fever, focal reaction in the patches, and muscular pains. This phase is followed by lessening of the eruption. The reaction is regarded by some observers as similar to a serum reaction, but Barber thinks that it is due to the effect of the drug on the streptococci themselves, dissolving their capsules and liberating toxins the absorption of which causes the clinical symptoms mentioned. Subsequent doses of the sulphonamide usually cause progressively less severe reactions, because there are fewer organisms remaining to be destroyed. Barber brings forward evidence which tends to show that in some cases the streptococci responsible for the eruption are resident in the bowel. So many varieties of micro-organisms seem to be able to live there without causing much trouble to their host that one is inclined to doubt the pathogenicity of faecal streptococci, but Barber still thinks that in certain cases they are important. In cases where there is reason to suppose that the disease is due to a tuberculous infection these reactions do not occur, nor is the eruption improved. Barber's observations extend over some three years or more, and he states that he is now able to predict in selected cases the train of events which will follow the administration of sulphapyridine. There is no doubt that he has made a valuable contribution to the therapy of lupus erythematosus.

1 Brit. J. Derm. Syph., 1941, 53, 1, 33.

CLINICAL MEASURE OF PULMONARY ELASTICITY

To measure the elasticity of a substance two factors must be determined: (1) the force producing distortion and (2) the amount of that distortion. In the case of the lungs the first of these can be ascertained from the changes in intrapleural pressure occurring with respiration, and the second from the changes in the volume of the lungs during respiration. Both factors must, of course, be determined simultaneously. On the basis of experiments carried out in living animals by Cleotta[1] in 1913 two different methods of measuring the elasticity of the lungs in living patients have been described by v. Neergaard and Wirz[2] and by Christie and McIntosh.[3] The former determined the intrapleural pressure at those points in the respiratory cycle when the elastic forces within the lungs and thorax are in static equilibrium. By means of optical manometers on a moving photographic film the intrapleural pressure and the velocity of air flow in the trachea were measured at the same time. From the curves thus produced the authors ascertained the phase-change points on the intrapleural pressure curve, the volume of tidal air, and the "factor of elasticity." In order to take into account the variation in size of the lungs in different persons they advised that the volume of the lung in expiration should be calculated from a radiograph of the chest by the formula of Rohrer.[4] Christie and McIntosh registered simultaneously the volume of tidal air and the intrapleural pressure. They consider that the maximum change in intrapleural pressure between expiration and inspiration, as measured in centimetres of water, divided by the volume of tidal air in 100 c.cm. corresponding to that change in pressure, is a measure of elasticity, which they called the "unit of pulmonary distensibility." Whereas this value varied considerably in different individuals, it was remarkably constant in the same person and was independent of changes in the tidal air. To correct for this variation, due, among other things, to differences in the size of the lungs, and to furnish a normal standard of comparison between individuals, the "coefficient of distensibility" was adopted. This was defined as the change in the intrapleural pressure which accompanies ordinary inspiration. J. R. Paine,[5] who has recently investigated the elasticity of the lungs in twenty-three patients by both these methods, found that of Christie and McIntosh to be superior to that of v. Neergaard and Wirz, the technique being simpler and the results more consistent. In eight patients whose lungs were thought to be normal the change in intrapleural pressure accompanying an increase in the volume of the lungs of 100 c.cm. (unit of pulmonary distensibility)

1 Arch. ges. Physiol., 1913, 152, 359.
2 Z. klin. Med., 1927, 105, 35, 51.
3 J. clin. Invest., 1934, 13, 979.
4 Arch. ges. Physiol., 1926, 165, 445.
5 J. thorac. Surg., 1940, 9, 330.

varied from 0.79 to 1.56. The change accompanying an ordinary inspiration (coefficient of pulmonary distensibility) in the same patients varied from 3.4 to 7.6. The latter is considered by Paine to be the best measure of pulmonary elasticity. Out of ten patients with bronchial asthma, chronic bronchitis, or both, nine showed decreased pulmonary elasticity, the decrease being marked in seven of them. Slight pulmonary emphysema cannot be diagnosed with certainty by *x*-ray examination, but it was found that where the emphysema was extensive the radiological interpretation of chest films correlated well with the measurement of pulmonary elasticity. In eight patients with moderate to severe emphysema as determined by *x*-ray examination, the unit of pulmonary distensibility was found to vary from 2.19 to 8.73 and the coefficient of pulmonary distensibility from 11.20 to 21.83.

ACACIA FOR THE NEPHROTIC SYNDROME

It is well known that in oedema of nephrotic type the serum proteins are diminished. This finding is common both in cases diagnosed as lipoid nephrosis and in cases of glomerulonephritis in the subacute stage, with persistent oedema. It is unnecessary to repeat here the reasons for believing that this reduction in serum protein (and therefore in colloid osmotic pressure) is an important cause of the oedema. This is the rationale of the high protein diet of intravenous acacia, and, more recently, of injections of concentrated human serum.

Hartmann[1] was the first to use acacia systematically, and reported good results in children. Later reports, however, varied considerably. Some workers have observed ill effects, including enlargement of the liver, so that with many physicians acacia treatment has fallen into disfavour. Goudsmit and Binger[2] at the Mayo Clinic have therefore made a careful study of the results of acacia treatment in forty adult patients. The preparation used was a 6% solution of gum acacia in 0.06% sodium chloride. Particulars are given of the method by which it is prepared; this is of great importance in the avoidance of unpleasant reactions. The solution is administered intravenously, in doses of about 500 c.cm., forty-five to seventy-five minutes being taken for the injection. This is repeated every day or every other day until a total dosage of 60 to 100 grammes of acacia (1½ to 2 grammes per kg. body weight) is reached. Other methods of treatment are combined with this, especially a high-protein salt-free diet, restriction of fluid intake to one litre or less, and the administration of diuretic salts, the one generally used being potassium nitrate in doses of 6 to 12 grammes daily. This salt is given by mouth in 1/2-gramme capsules, and should be begun three or four days before the injection of acacia. The importance of these accessory measures is stressed by the authors, but it is obvious from the case histories that the results could not have been achieved without the acacia. For instance, the first patient, after all other treatment had proved useless, lost 23½ lb. in weight after the first injection of 350 c.cm. of acacia solution. In forty cases there were only four which failed to respond by loss of all, or of practically all, the oedema. Some of the cases showed some degree of renal insufficiency, and no attempt was made to restrict the treatment to cases of pure nephrosis. The only undesirable effects were urticaria, thoracic discomfort, and fever; but they were never serious. The ill effects noted by other authors, including liver enlargement, were not observed. It is probable that when these occur they are due to the administration of too much acacia or to lack of care in its preparation. Failures were usually the result of the administration of insufficient diuretic salts or insufficient acacia, and of failure to control the anorexia and vomiting that sometimes occur in these patients. In the successful cases an average of from 1 to 3 lb. in weight was lost per day. A second course of treatment, if necessary, can be given after an interval. Reports so far published on the use of concentrated serum in renal oedema do not show consistently successful results, and in most laboratories the concentration presents technical difficulties. The use of acacia as a routine in the treatment of these obstinate cases therefore seems to be justified.

1 *J. Amer. med. Ass.*, 1933, 100, 251.
2 *Arch. intern. Med.*, 1940, 66, 1252.

BUERGER'S DISEASE AND TYPHUS

Thrombo-angiitis obliterans, or Buerger's disease, is an unfamiliar though not altogether unknown condition in this country. It produces severe pain and ultimately gangrene of the lower extremities at an earlier stage in life than that of most degenerative arterial lesions, and is said to occur almost exclusively among Jews. It is not a degenerative but an inflammatory lesion, an arteritis leading to thrombosis with subsequent canalization. This fact alone strongly suggests an infective origin, and the suppositions that excessive use of tobacco or alcohol, changes in the viscosity, coagulability, or volume of the blood, or excessive consumption of salt are responsible in any way for the disease have little to support them. Both accidental and deliberate transmission of the disease by material from the lesion have also been known, a fact pointing strongly to the presence of a microbic cause. It was first suggested many years ago by C. Goodman that the disease may be a late manifestation of typhus, and he now[1] restates the evidence in favour of this hypothesis and adds to it. Some of this evidence is only suggestive; the lesion of typhus is, of course, vascular—although smaller vessels are attacked in the acute stage—and peripheral gangrene is recognized as a complication both of typhus and of other rickettsial infections. The belief that the disease is restricted to the Jewish race, which would of course introduce an aetiological factor hardly compatible with so positive a primary cause as typhus infection, is mistaken; in America it chiefly attacks recent immigrants from Eastern Europe, who often happen to be Jews, but who include Estonians and Russians; in Russia, Gentiles as well as Jews are attacked, and the Chinese and Japanese also suffer from it. More direct evidence is the alleged demonstration of rickettsial bodies in the vascular lesions, and the demonstration of cutaneous sensitivity to a rickettsia suspension in almost all of a large number of cases of thrombo-angiitis obliterans tested for this, with almost consistently negative results in control patients; the suspensions used gave similar results in patients known to have had typhus. Although our opportunities of studying this problem are fewer, the possibility of past typhus is perhaps worth while bearing in mind in cases of unexplained peripheral gangrene.

The next session of the General Medical Council will open on Tuesday, May 27, at 2 p.m., when the President, Mr. H. L. Eason, will take the chair and deliver an address.

1 *J. Mt. Sinai Hosp.*, N.Y., 1941, 7, 391.

The Governors of the Society of the New York Hospital, created by Royal Charter in 1771 in the reign of King George III, announce the recent completion at the New York Hospital, Westchester Division, White Plains, of the Nichols Memorial Cottage, in memory of Dr. Charles H. Nichols, attending physician 1849 to 1852, medical superintendent 1877 to 1889.

MEDICAL PLANNING COMMISSION

FIRST MEETING

SCOPE AND PROCEDURE DISCUSSED

The first meeting of the Medical Planning Commission, which has been set up by the British Medical Association, with the co-operation of the English Royal Colleges and the Scottish Corporations, to study wartime developments and their effects on the country's medical services both present and future, was held at the B.M.A. House, London, on May 7. More than sixty of the sixty-seven members of the Commission were present.

Welcome by Chairman of Council

Mr. H. S. SOUTTAR, in welcoming the members, said that he believed no body had ever met which had so fully represented the medical practice of the country in all its varied aspects. The problems of medical service after the war would be complex and difficult enough, but upon their solution would largely depend the health of the nation. It was the profession's desire that every individual should have at his service, whatever his economic status, all necessary medical resources. This country had gone a long way towards achieving that aim, for the whole population in industrial employment was included under national health insurance. There was a strong feeling that the service enjoyed by the worker should be extended to his dependants, which would mean that nearly 80% of the population would be included, and if, as had also been suggested, the insurance income limit were raised, possibly 95%—or some forty million individuals—would be cared for by this service. Moreover, there was a strong demand that a consultant and specialist service with full hospital facilities should be added. The provision of a complete medical service for 95% of the population constituted a problem of the first magnitude. It might be met by establishing a whole-time State Medical Service; this would be a complete break with the traditions of medical practice in this country, but it must be carefully examined. On the other hand, the present service might be developed, but here again the great changes which its extension would bring about had to be considered. On one point they would all agree, that everything within their power must be done to maintain the close personal relation between doctor and patient which had been characteristic of British medical practice.

Mr. Souttar concluded by saying that although the Commission had been initiated by the British Medical Association it was an entirely free body, not bound by the Association's policy. It would carry on its business as it determined, but the whole resources of the Association were at its disposal, including secretarial and clerical assistance. To assist discussion the secretariat had drawn up a memorandum, purely for information, embodying the views on practice accepted by the Association, as well as by other societies and individuals, also a bibliography of the more important literature on the subject.

Election of Chairman

On the motion of LORD DAWSON OF PENN, seconded by Sir ALFRED WEBB-JOHNSON, Mr. Souttar was unanimously elected to the chair of the Commission.

Additions to Membership

Suggestions from several bodies for special representation on the Commission were on the agenda.

In reply to Dr. G. F. BUCHAN, who asked what was the position of members in relation to the bodies by which some of them had been appointed, the CHAIRMAN said that none of the bodies represented was bound in any way by any report which the Commission might issue, unless, of course, it chose to adopt it. The speech or action of its representative did not bind any body. One request for representation which he thought should be acceded to was from the Medical Advisory Committee of the Nuffield Trust, which asked that its chairman, Sir Farquhar Buzzard, be appointed. He proposed that this suggestion be adopted. This was agreed to.

The CHAIRMAN said that the Ministry of Pensions desired to send an observer. The Ministry of Health and the Department of Health for Scotland had observers on the Commission. Dr. BUCHAN mentioned a number of other Government Departments and quasi-Government Departments with medical interests which might make a similar request, and said that he was not quite sure how far it was necessary or desirable to carry this principle. After a short debate it was agreed to postpone the consideration of this request until it was known whether and what other claims were made on behalf of official bodies.

Dr. E. A. GREGG said that the Insurance Acts Committee, of which he was chairman, had had before it many serious criticisms of the composition of the Commission, and was satisfied that there was considerable feeling throughout the country that general practitioners were not sufficiently represented. If additional general practitioners were appointed by a representative body it would go far to create a favourable atmosphere in the profession generally for the consideration of the reports which would eventually issue from the Commission. Dr. D. G. GREENFIELD spoke to the same effect, while admitting that there were a number of general practitioners on the Commission already.

The CHAIRMAN said that twenty-four members of the Commission might fairly be described as general practitioners; nevertheless, he had sympathy with the request of the Insurance Acts Committee. Dr. J. B. MILLER said that there was no criticism of the general practitioners already appointed except on the ground of their age, and even in that respect the experienced practitioner was perhaps more valuable on a commission of that kind than the young. But the feeling on the subject was due to the fact that practitioners as a body had had no opportunity to nominate representatives. Prof. R. M. F. PICKEN supported the proposal. Mr. BISHOP HARMAN said that while he sympathized with the view of the Insurance Acts Committee, he felt that the addition of a few members would make no difference to the influence which general practitioners would exercise on the findings of the Commission. Sir JAMES WALTON agreed that the real power would lie in the sectional committees, but what was now proposed would help to allay the criticism that the general practitioner, especially the rural practitioner, was not adequately represented. The great difficulty that the Commission might have to encounter was lack of unanimity in the profession, and so long as there was a feeling that general practitioner interests were not fully represented such unanimity would be all the more difficult to secure.

After some further discussion it was agreed that the Insurance Acts Committee be asked to nominate four general practitioners (three urban and one rural). On the suggestion of Dr. J. W. BONE, Dr. GREGG undertook to ask his committee to ensure that one of the nominees was from a colliery area.

Mr. SOMERVILLE HASTINGS said that it was important to represent ideas, not interests only, and therefore he asked for direct representation of the Socialist Medical Association. Dr. PETER MACDONALD, while having no special sympathy with the aims of that body so far as he knew them, thought it would be wise to accede to this request. Dr. J. M. MACKINTOSH thought the meeting was in danger of getting hopelessly entangled between representation and delegation. Mr. ZACHARY COPE suggested that the Commission had at least one very experienced and well-informed member of the Socialist Medical Association—Mr. Hastings himself. The Commission decided not to give special representation in this instance. Mr. G. F. GIBBERD pointed out that there were only three obstetricians and gynaecologists on the Commission, and urged an increased representation. The CHAIRMAN suggested that the proper course here was co-option on to the appropriate committees. Dr. DAVID WILSON urged the claims of the Association of British Ophthalmologists.

Dr. G. C. ANDERSON (Secretary) said that some members were looking at this matter from the wrong angle. The idea in appointing members to the Commission was to obtain a number of people who had some contributions to make to the problems in hand. With few exceptions they were chosen not because they happened to be representatives of a particular organization but because they were known by their writings or work to have something useful to offer. If now they started to form a commission composed of people who were there because they represented this or that organization they would get a body which in the end would not produce any report at all.

Dr. INGLIS CAMERON said that it was now clear that there were no delegates on the Commission, only a certain number of representatives, and others who were present in an individual capacity. He felt that we able better by

Mr. Souttar in a recent issue of the *Journal* went far to satisfy the critics, and if now a short statement could be published explaining a little more clearly—though not too precisely—the purpose of the Commission, the interpretation of its reference, and the status of its members in relation to the bodies appointing them it would complete the process of "disarmament."

Dr. S. WAND suggested that the question of representation of medical students and of members of the profession serving in the Forces might be considered. The CHAIRMAN thought that the views of these groups again might be most usefully elicited in the committees. The National Union of Students (British Medical Student Association) had already been asked by himself to submit a memorandum for the Commission at a later stage.

The Commission then agreed to the membership as originally set out[1], subject to the additions made—namely, a representative of the Medical Advisory Committee of the Nuffield Trust and four general practitioners to be nominated by the Insurance Acts Committee.

Scope of the Commission

Lord DAWSON OF PENN said that members of the Commission might be assisted if they perused again the report of the Consultative Committee on Medical and Allied Services, which was appointed by the Government after the last war to go into a good many of the questions which the new Commission would have to face. It was always a matter of pride to him as chairman that that committee reported unanimously. He thought the Commission should avoid trying to put up something brand new or something which aimed at too great completeness. The practice of medicine had been built up generation by generation, and it was only because medical knowledge had so far outstripped the organization of the practice of medicine that it was necessary for a body like this to pass the practice in review. In trying to plan so as to meet the needs of modern society with all its economic difficulties and at the same time to recognize the great growth of knowledge that had taken place, he thought they should bear in mind the "inevitability of gradualness." The most important question to settle was the regionalization of hospitals and health services. The practice of medicine in all its branches must become increasingly institutional, partly because of the growth of knowledge and the need for team work, also because the best that medicine could provide should be made available to every citizen. Some professions would be quite easy to plan for, but in medicine it was difficult because while planning the fabric they must preserve freedom of thought and initiative. It was not easy to apply collectivism to the fabric and yet maintain individualism in the human relationships. Another big question was the bridging of the gap between preventive and curative medicine. If these basic principles were settled first, all other things would be added unto them. He hoped the Commission would not attempt to issue a single report at a particular time, but rather to publish interim reports—no matter how many so long as they preserved a certain sequence. With regard to regionalization, which seemed to him the first problem to be tackled, it was well to remember that this was not new, it was dealt with by the Consultative Committee to which he had referred, but now it came forward with a certain urgency owing to the war. War did not so much create new problems as bring to the forefront problems which had been for long in the stage of incubation. Some most excellent work on this subject had already been done in Oxford under the auspices of the Nuffield Trust, and of this the Commission would take cognizance. The Commission must also address itself to the bridging of the gap between preventive and curative medicine so as to endeavour to present a united medicine to the student of the future. This fitted in with regionalization; and, this achieved, more than half the work of the Commission would be done. The work of the Commission would be carried out mainly in committees, which would have considerable freedom of action and would co-opt representatives, not of interests, but of different aspects of knowledge and experience. He suggested that to get a team in each committee it would be well to appoint nomination committees in the first instance. In conclusion Lord Dawson said that he liked to think of the medical profession filling its great place in the body politic. There was no profession which had widened in their generation to anything like the extent that medicine had done. The whole of the problems concerned with constructive health had really become part of medical thought in relatively recent years. They were not yet fully accepted, but it was largely because of their gradual acceptance that the Commission had been assembled to undertake a task of integration which he hoped would result in an even greater profession than the one they had had the honour of serving.

Sir FRANCIS FREMANTLE, M.P., said that there was much talk about revolution in the whole procedure of medicine, but he hoped the Commission in its public pronouncements would be on guard against revolutionary suggestions which would antagonize opinion in Parliament and in the country. The proposals they put forward should be based on the natural processes of growth. The question of medical auxiliaries, in particular the extension of the work of the district nurse, would he hoped be borne in mind.

Mr. SOMERVILLE HASTINGS felt that the Commission would want to know a great deal more about the conditions of general practice, hospital practice, and so on. The first thing to do was to bring their knowledge of conditions as they were right up to date. He appealed to members of the Commission to put away all preconceived ideas and to think only of the future of medicine and of the people of this country, without thought of sectional interests or individual interests or even of the interests of the profession as a whole.

Dr. G. F. BUCHAN thought that the first business of the Commission should be consolidation. It seemed to him that the two main subjects for consideration were general practice and hospital practice. General practitioners and public health practitioners had been unfortunately to some extent in conflict. The thing for the Commission to do in the first instance was to ascertain what common measure of agreement there might be, not to publish separate reports putting forward sectional points of view.

Procedure

On reassembling in the afternoon the Commission had before it certain suggestions for procedure. These were that there should be established five committees, dealing respectively with general practice, special practice, public health, hospitals, and the teaching hospitals, and a sixth, a Co-ordination Committee, which would integrate the reports of the others into one draft report. The five subject committees would meet separately (or jointly, when thought desirable) and consider the principles of medical organization or reorganization within their spheres, endeavouring to report progress to the Co-ordination Committee by the end of the year or as soon as possible thereafter. The draft reports of the Co-ordination Committee, before being approved by the Commission, would be submitted to the bodies represented thereon and to the profession generally and the comments and criticisms received would be considered by the Co-ordination Committee, which would then submit a draft report or reports to the Commission, with such criticisms and recommendations received as had not been included in the reports. Following this, the general principles having been laid down by the Commission, fresh committees would be set up to elaborate details of its policy.

Mr. BISHOP HARMAN urged that the sectional committees should be recommended to ask any representative medical organization concerned in that sphere of practice for the opinion of its members on general policy within that sphere and on such details as might arise. Many of the criticisms which had appeared in the *Journal* would be withdrawn if it were known that all groups of practitioners would be consulted on the particular matters with which they were concerned.

Dr. D. STARK MURRAY criticized the terms of reference for the proposed committees. Instead of considering the principles of organization and development in the five fields named, they might well concentrate on the discussion of domiciliary medical service, the prevention of disease, preservation of health, and treatment of the sick, allowing the consideration of special work to wait for the present.

Colonel R. G. GORDON thought that the work of the Commission might very well be done through a different set of committees from the ones proposed. Thus there might be committees concerned with domiciliary service, with hospital service, with out-patient clinics, with preventive medicine, with rehabilitation, with ancillary services, and with medical education.

[1] See *Supplement*, Jan. 4, 1941.



CLIMACTERIC SYNDROME RELIEVED

"High Doses of Oestrin are usually unnecessary, at any rate for the commoner menopausal symptoms—such as vasomotor disturbances—and consequently oestrin injections are, fortunately, seldom required. It has been my practice to begin with doses of about 500 I.U. daily by mouth. If this does not control the symptoms the dose is raised to 1,000 . . . this is usually completely effective. There are, of course, certain more severe sequelæ of the menopause, which demand much higher doses . . . Pruritis, Kraurosis, Leukoplakia vulvæ, fall into this class and, provided sufficiently high doses are given, the results are little short of miraculous."

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MENFORMON TABLETS

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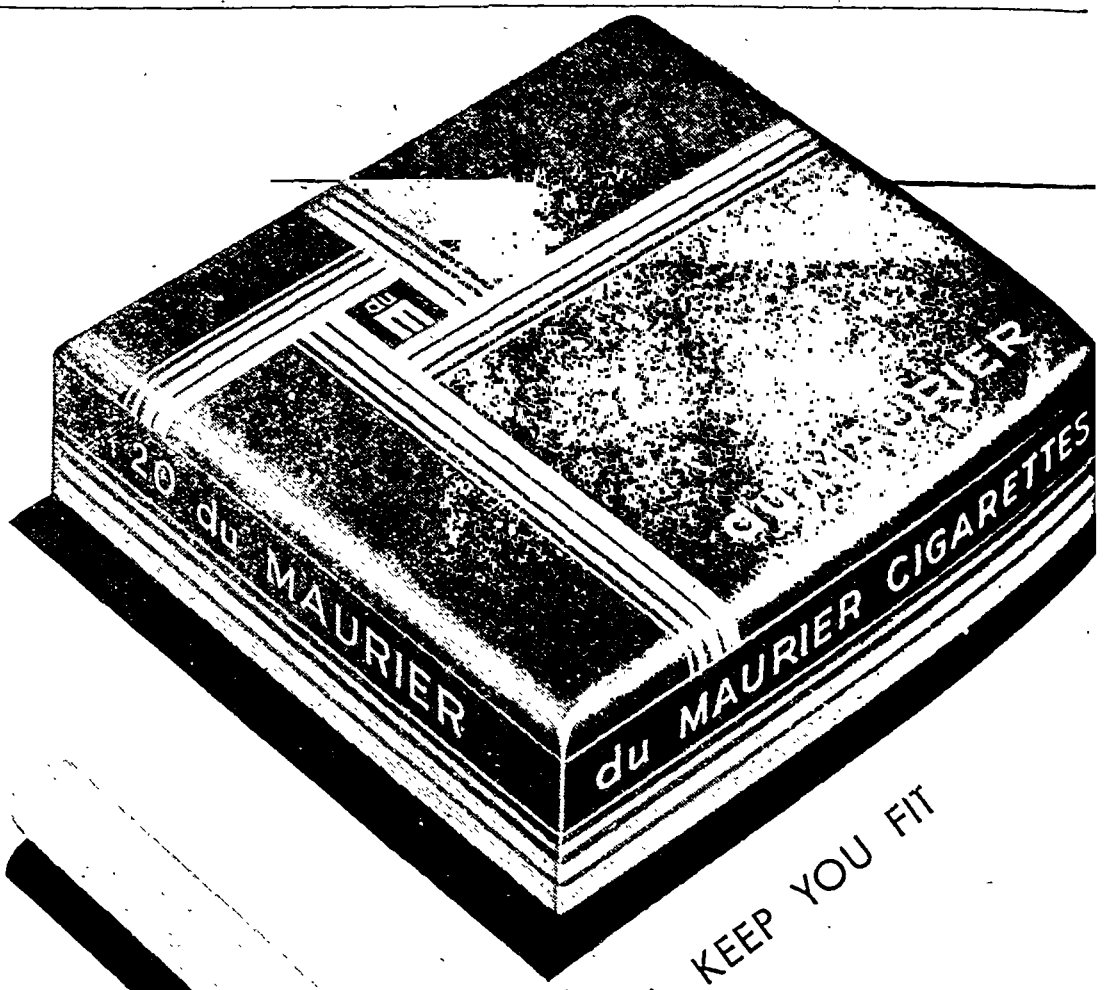
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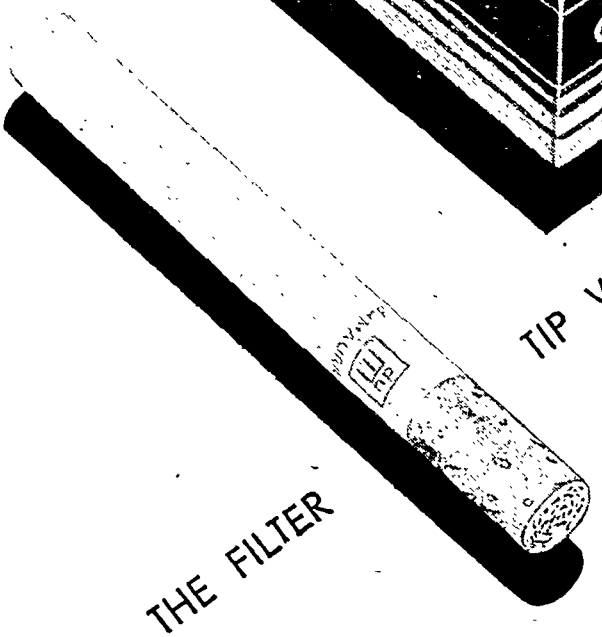
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Dr. H. G DAIN said that there was some danger that the committees might start with different outlooks and bring to the Co-ordinating Committee work badly arranged from the point of view of the Commission as a whole. The better thing would be to establish the basic principles and ask the committees for their criticisms on these before they considered their own specific departments. Mr. WILFRID ADAMS suggested that some committee should consider not only the education of the profession but the education of the public in hygiene and an elementary knowledge of disease. Dr. H. H. MACWILLIAM said that from the Chairman's opening remarks it appeared that a future must be visualized in which 5% of the population would provide all the funds for private practice, and even this proportion might be still further diminished if the war went on for a very long time. The economics of the profession seemed to be a subject worthy of consideration by a committee. With regard to regionalization, a point that troubled him in the Nuffield Trust arrangements was that apparently they visualized an area from Anglesey to Carlisle with one key hospital in the centre. On these questions it seemed to him that the suggested procedure of the Commission was well adapted to get useful answers.

Mr. JOHN HUNTER, Dr. FRANK GAY, and Dr. O. C. CARTER supported the arrangement for committees as laid down in the original suggestions. Mr. SOMERVILLE HASTINGS said that the first thing to do was to make a survey, either as a Commission or through the committees, of the various fields. Medicine was not a science: its present position had been reached largely by a series of happy accidents. He did not think that basic principles could be immediately determined. They must be influenced in their deliberations by expediency, and the basic principles of organization had to come last of all. Their task was to arrange for an efficient service for the public, and it would be a mistake to try to pin that down to basic principles, as to which most of them had already preconceived ideas.

Dr. ANDERSON (Secretary) explained the idea behind the planning of the committees. The General Practice Committee, for example, would want to find out what was the state of general practice at the present moment, whether it should be linked up with some other agencies at work in isolation, and how to reconcile collective responsibility with individual freedom. Then the Co-ordinating Committee would come into being and would be able through the representations it received from these committees to lay down the basic principles to guide all concerned in the future consideration of the problems.

Dr. J. A. BROWN pointed out that certain basic principles had already been put forward in the Association's grey book, "A General Medical Service for the Nation."

The proposal to set up the five committees, together with a co-ordinating committee, was generally approved.

The Teaching Hospitals

Some discussion centred round the appointment of a Teaching Hospitals Committee.

Dr. S. WAND objected to the term "teaching hospitals," and wanted the committee to have as its reference "medical education, including postgraduate education and research." Dr. DAIN questioned whether it was right to exclude the teaching hospitals from the terms of reference of the Hospitals Committee. Apart from teaching, the work of those hospitals was the same as that of hospitals generally. Mr. SOMERVILLE HASTINGS hoped that at some time in the future all hospitals might be used for teaching, and that the Teaching Hospitals Committee, even if it retained its name, would in effect be a medical education committee. Prof. PICKEN said that this division of hospitals was quite irrational. Those who had been associated with the development of the municipal hospital knew that to an increasing extent it took part in teaching.

Sir ALFRED WEBB-JOHNSON thought that most of the objections to the separation of these two committees would be overcome if the Commission decided that the Hospitals Committee should consider all hospitals as within its province, including teaching hospitals. Nevertheless there were problems peculiar to the teaching hospitals.

Sir GIRLING BALL spoke to the same effect. The teaching hospitals were themselves very anxious to come into contact with other hospitals, especially municipal hospitals. Therefore he thought one committee could do the whole of the work as regards hospitals, except for the special problems relating to medical education.

It was then agreed that the words "excluding teaching hospitals" should be deleted from the terms of reference of the Hospitals Committee, which were to consider and report "on the principles of organization and development of hospitals, voluntary and council."

The terms of reference of the Teaching Hospitals Committee read: ". . . the principles of organization and development of teaching hospitals," and Mr. HASTINGS moved to substitute the words "the teaching of medicine." Mr. HUNTER thought that this would open up a wide issue, nothing less than the whole of the medical curriculum. Sir A. WEBB-JOHNSON pointed out that the original terms of reference did not exclude clinical teaching, whereas the terms which Mr Hastings proposed excluded the teaching hospitals. The CHAIRMAN suggested the words "hospitals engaged in undergraduate and postgraduate education," but Mr. HASTINGS was still not satisfied, saying that he was not convinced that teaching must always be within the walls of a hospital. He would not rule out the possibility of some medical education being undertaken by general practitioners.

Eventually Sir ALFRED WEBB-JOHNSON moved, and Sir GIRLING BALL seconded, that the reference should be: ". . . on the principles of organization and development of the teaching hospitals and clinical education." Mr HASTINGS said that this satisfied him, and the amendment was approved by the Commission.

Appointment of Committees

Certain nominations for each of the committees were then agreed to. The nominations were so arranged that each committee contained a majority of those with a direct interest in the subject of the reference and a minority of practitioners not so directly interested. The Co-ordination Committee was created to consist of the Chairman of the Commission the Chairmen of the five subject committees, and three members appointed by each of those committees.

A brief discussion took place on the powers of the committees to co-opt additional members from outside and it was agreed that each committee should have the power to co-opt two members, but that the Chairman of the Commission should have power to authorize the co-option of four members in all if he regarded it as necessary.

Colonel GORDON mentioned the desirability of eliciting the views of members in the Services. He suggested that when draft reports from the Co-ordinating Committee were about to be presented some member should go preferably to each Home Command, and there, at the central hospital, it would not be difficult to get a large number of medical officers from surrounding hospitals to attend, and they would be able to express their opinions and air any grievances.

The CHAIRMAN said that this valuable suggestion would be noted. He thought the proposal made earlier by Mr. Bishop Harman concerning the eliciting of opinions from representative medical organizations had been met by the proposal to issue draft interim reports and by the arrangements for securing adequate representation by co-option and otherwise of the views of groups and bodies not represented on the committees, and in particular practitioners on service. The question of increased representation of obstetricians and gynecologists to which Mr. Gibberd had referred had better be left to the committees themselves.

This concluded the business of the first meeting.

Speaking at the annual meeting of the Cremation Society, Lord Horder (the new president) said that the first great war created an increased interest in cremation, and it was safe to prophesy that the second great war will take that increased interest still further. For the first time in its history cremation was being placed on an equal footing with earth burial. Many local authorities were reducing their fees in cases of air-raid victims. The society's annual report showed a record increase of 2%, in the number of cremations carried out in Great Britain during 1940—25,175, compared with 19,813 in 1939 and 11,280 in 1936. The number of crematoria had increased from thirty-three in 1939 to fifty-six in 1940.

BLAST PROTECTION FOR HOSPITAL WINDOWS

Air raids are increasing in their intensity; the weight and destructive capacity of bombs are greater, and hospitals are more likely to be put out of action even from a "near-miss." Experience has shown the need for bricking up the windows of resuscitation wards. It is not only that destruction of windows and black-out material raises difficult problems of lighting, but the temperature of the ward may fall so seriously as to endanger the patients from that cause alone. Arguments for occluding the window-openings apply to theatres too; and, with somewhat less force, to general wards, where bricked-up windows mean difficulties of ventilation and serious interference with the patients' comfort.

If the principles of "switching," to which reference has recently been made, are understood and acted upon, the number of casualties admitted to any one hospital during a heavy raid will not usually be great, and possibly a good plan would be to have "safe" accommodation in the larger central hospitals for, say, 100 patients. When not required for casualties, wards are frequently used for general hospital purposes, and it might be well to brick up two windows out of three in such wards, the third window having bricks only to a height of, say, 6 ft. or 6 ft. 6 in. from the sill-level. If the top part of these windows should go it will be necessary, to make the black-out effective, to have portable screens ready to put quickly in place. Unless something of this sort is done, the wards will really not be habitable or usable for dual purposes. There will still be danger from flying glass, but there do not appear to have been many injuries from this source in wards with unprotected windows. In wards where patients stay for two or three weeks loss of sunlight is a serious deterrent to recovery, but in a resuscitation ward, where the usual stay is a matter of hours, it is not so important.

Every hospital should have one theatre with blocked-up windows unless there is an underground theatre or one so situated inside the building that it is not subject to blast. In the present state of the labour market it would be idle to ask for the bricking-up of all windows in hospitals in vulnerable or specified areas, but there is a recognized machinery for obtaining help in matters of both labour and supply of materials. It is unfortunate that comparatively few members of the profession fully understand the Regional organization of the Ministry of Health, which provides that machinery. It is based upon the Civil Defence Regions, in each of which there is a Commissioner, who, in the event of the isolation of his region, becomes what might be called "viceroy." At his headquarters he has a staff of officers of the Ministry of Home Security, with a Senior Regional Officer (S.R.O.) in charge. The Ministry of Health has a regional headquarters staff in a near-by building in the charge of its own S.R.O. Between the two Ministerial headquarters there is a liaison which is closer in some Regions than in others. Approach to the S.R.O. of the Ministry of Health for E.M.S. purposes by all medical officers of health or superintendents of hospitals is through the Hospital Officer of the Region, who may be reached directly or through the Group Officer. In Region V (London) the Sector Group Officers have the status of Hospital Officers and have, like Hospital Officers, direct access to the Director-General.

A great deal of authority has been delegated by the Ministry of Health to its Senior Regional Officers so that there may be no delay in putting in hand urgent work which complies with the requirements of settled policy. Moreover, representations made to Regional Officers are transmitted to the Ministry and receive consideration in modifications of policy which changing conditions may dictate.

A proposal, such as that to brick up windows, should be put through the Hospital Officer to the S.R.O., who, if he approves, will authorize expenditure (ranking for grant) and do his best to facilitate and expedite "supply" of both material and labour. All work entailing expenditure of money, labour, or materials should be put forward with a reasoned statement of its necessity and urgency to the S.R.O. He, within limits, has power to put matters in hand at once, and in very many cases can do so without reference to Whitehall.

Local News

ENGLAND AND WALES

The Westminster Hospital Carries On

A heroic story can now be told of the new Westminster Hospital at Millbank. This hospital received direct hits; the most serious blew out all the windows and cracked or broke down many walls and partitions. But the hospital never ceased to function. The out-patient departments reopened within a week, and within three weeks had a daily attendance of 400 patients. Within a week also 50 beds were again available in the wards, within a fortnight 169 beds, and within three weeks 292, which is to be the maximum for the next three months at least, as compared with 256 before the raid. One side of the hospital was put out of action and has been sealed off; a single wall now divides the normal hospital activities from a ruined building. When the bomb struck Westminster Hospital an operation had just been completed, but in spite of the fact that the four occupants of the theatre were buried knee-deep in debris only a slight scratch was received by one of them. On the night of the occurrence bad casualties had to be admitted to the wards, and some were treated at the first-aid post attached to the hospital. During the raid all the patients in the wards were evacuated to the basement by the staff; this took place while fires were raging around the hospital and one on the fourth floor of the hospital itself. A basement room was quickly fitted up as a theatre, and casualties were attended during the whole of the time. Dr. O'Brien, representative of the Rockefeller Trust, was present and afterwards sent a letter to the Minister of Health praising in the highest terms the courage and skill shown by all concerned in dealing with a frightful situation, also mentioning the complete lack of panic or hysteria among the patients themselves, thanks to the matter-of-fact behaviour of the staff. Westminster Hospital has an arrangement with the Surrey County Council whereby 25 beds have been opened in Surrey, the hospital providing complete equipment and staff. Six medical students are in residence there; others are obtaining clinical instruction at hospitals elsewhere in the sector.

St. Bartholomew's Under Fire

Of the eight hundred years which St. Bartholomew's has seen, 1940 was surely the most exciting. The treasurer's report, usually a pedestrian document, tells a heroic story. The hospital has been hit several times during aerial bombardments, but without very serious damage. In September a high-explosive bomb fell immediately outside the nurses' home without causing casualties, and later in the same month a bomb fell on the anatomical lecture theatre and its annexes, which were completely demolished, but the buildings were unoccupied. More recently a bomb fell through the roof and floor of the operating theatre in the casualty block, but did not explode, and the damage, though substantial, was only a fraction of what would have been caused had it done so. On the night of December 29, when thousands of incendiary bombs were dropped on the City of London and very large fires were started, the hospital was for a time deprived of its supply of water, gas, and one circuit of electricity, and it was receiving air-raid casualties, of which nearly one-half had to be kept in the wards. At about ten o'clock that night the police warned the hospital that the fire brigade was finding difficulty in checking the flames, and that it might be necessary to order complete evacuation at very short notice. As the lifts were out of action it was decided to begin immediately to evacuate 102 of the 223 patients in hospital. These patients were carried on stretchers down the stairs, loaded in motor coaches, and taken without mishap to a sector hospital, all within two hours. On numerous other occasions the hospital has found itself the centre of an area which appeared to be the enemy's main objective, and the treasurer, on behalf of the governors, expresses his profound admiration "of the loyal, devoted, and courageous manner in which they conducted themselves on all occasions. . . . The medical staff, aided nobly by the students and members of the lay staff, have given of their best, and all I need say is that Bart's expected of them no less." Every roof of the hospital has been fitted with fire-

fighting appliances, and six regular fire squads are on duty every night.

The income of Bart's in 1940 (£203,000) is down by £12,000 on the year. There has been a large diminution of income through loss of rentals of hospital property owing to enemy bombing. The daily average number of patients in hospital was 137, and the average duration of stay just under ten days. The first attendances of out-patients numbered 12,680, as compared with 21,790 in 1939, and the first attendances of casualty patients just upon 42,000.

Correspondence

Treatment of Burns

SIR,—Mr. Rainsford Mowlem (May 3, p. 686) raises a most interesting point in the last sentence of his letter on the treatment of burns. He says that he hopes that in the near future only innocuous substances will be issued to first-aid posts, etc. I heartily agree. So often one finds that a burn has been sent up to hospital covered with one of the excellent coagulant jellies applied by someone who is not qualified to use them. When such a case arrives, it is very hard to see the extent of the burn, and often it is not until the patient is in the theatre that one finds out just how bad the burn is.

Surely the most important thing in dealing with burns is the cleansing of the burn under an anaesthetic in the operating theatre, and for first-aid work a compress of sodii bicarb. is all that is required to allay the pain of the burn. When the patient arrives in the hospital this can easily be removed without sticking, and the burn can then be correctly examined. Would that the first-aid workers will remember this. —I am, etc.,

Royal West Sussex Hospital, May 5. JOHN GORDON.

Subcutaneous Ligature of Varicose Veins

SIR,—I was interested in Dr. H. S. Russell's article (April 26, p. 626). He realizes that something more than mere injection of large internal saphenous veins is necessary if occlusion and permanent or semi-permanent results are to be obtained. I quite agree that the trend of the most modern treatment of varicose veins has swung back from pure injection to a combination of ligature-injection—even better, to excision of a portion of the internal saphenous vein. The last-mentioned is really the only guarantee against recanalization. But I also agree that his excision lifts the treatment out of the hands of capable general practitioners merely for want of an operating theatre and an assistant.

Now Dr. Russell's method of the insertion of a perineum needle right through skin, subcutaneous tissue, and varicose vein seems to me to be rather a crude procedure which is adopted merely because the refinements of an operating theatre are denied to the average G.P. and to the vast majority of his patients; he could secure the theatre in a nursing home for his richer patients. I have always maintained (and been able to substantiate it in my large varicose vein clinic) that even the largest "drain pipes" can be occluded provided that: (1) An empty vein technique is employed—pneumatic tourniquet. (2) A sufficiently strong sclerosing solution is used—e.g., lithium salicylate 35% with 1% ethocaine, and quinine with urethane injected from separate syringes, preferably quickly through the same large-bored needle. (3) And, above all, that the vein is subsequently tightly compressed, so that the sides of its walls are kept in apposition for two to three days after the injection by firm compression with elastoplast. This is done by covering the injection site with collodion and either a firm wad of wool or about two inches of elastoplast rolled up into the form of a "cigarette," which is laid over the course of the vein; then elastoplast is applied, and the side flesh is drawn towards and over the "cigarette," and flesh from the other side is approximated so that not only the rolled elastoplast ("cigarette") but the flesh from the sides itself compresses the vein. *This strapping is left on for three days.*

With this procedure recanalization is rare. I am sure that with this procedure recanalization is not more likely than after the method described by Dr. Russell. Moreover, the injection method, followed by tight compression, is far less painful for the patient than Dr. Russell's method.

Another criticism of his method is that it opens the way to sepsis. In the treatment of 10,000 patients I have not yet had any case of sepsis following an injection.—I am, etc.,

Liverpool, May 2. STUART MCAUSLAND.

Abdominal Symptoms after taking Opium

SIR,—The correspondence in the *Journals* of February 8 (p. 215), March 22 (p. 461), and May 3 (p. 688) on abdominal pain after opium administration prompts me to write, but I have selected the title "abdominal symptoms" rather than "abdominal pain" to stress the possibility of severe vomiting where opium has been prescribed.

Mr. H. P. Winsbury-White (p. 461) quotes Sir Lauder Brunton's book as saying that opium stimulates intestinal peristalsis in some cases. I believe that the account of the action of opium in Hale White's *Materia Medica* (1935, p. 297) best explains the abdominal complications met with in practice. "Opium produces great loss of gastric tone, often spastic contraction of the pylorus, and inhibition of normal peristalsis in the stomach. Its emptying is delayed. In the small gut peristalsis and tone are increased. In the colon tone is often so great as to produce spasticity, and therefore further delay in the passage of food." A consideration of this description explains the sickness which may occasionally be so prolonged as to cause anxiety in seriously ill patients.

Personal experience leads me to believe that pain when it occurs is due to spasm of the pylorus. I have taken omnopon in a moderate dose, by mouth, twice in my life, and have only suffered from really severe epigastric pain twice in my life. (Only because a double experience rules out the possibility of the pain having been coincidental do I admit publicly to having been so inept as to take part in the second experiment. The truth of the matter is that I had forgotten all about the first experience.)

On each occasion I was awakened after about one and a half hours by very severe epigastric pain without pain in the hypochondrium. On the first occasion the pain was accompanied by sickness, but vomiting relieved it quite quickly. On the second occasion the pain was much more severe, and felt as it it might have been due to perforation of an ulcer. There was no sickness, but profuse sweating and a feeling of cold. After the pain had lasted perhaps ten to fifteen minutes without abating, several tablets of traesentin (an intestinal antispasmodic of complex formula) were tried. The pain was quickly and completely relieved, and sleep followed in a few minutes, but was disturbed again an hour later by another slighter attack of epigastric pain, which went very quickly after more traesentin. This drug was used because it was to hand, but atropine would appear to be a reasonable drug to use, as Mr Winsbury-White suggests.—I am, etc.,

Norwich, May 5. STEPHEN FALLA.

Frostbite

SIR,—In a letter by Dr. Raymond Greene (October 5, 1940, p. 469) it was pointed out that in the treatment of frostbite friction of any kind is dangerous. My experience treating a number of minor cases—ears and hands—confirms this; and I found the simplest methods satisfactory.

To avoid infection blisters were left intact and painted with a 1 in 1,000 solution of acridavine. They were then dusted with antiseptic powder and covered with cotton-wool. Over the wool the men wore woollen gloves and Balaclava helmets. Every case responded rapidly, without sepsis. The fluid in the blisters was absorbed within two or three days, leaving dry scales which peeled off, exposing healthy skin. No friction was used, and the only thermal treatment was the prevention of heat loss described.

I had the interest of watching my own recovery under this simple treatment. One finger was swollen, cherry-red, and painful, but numbed to pinprick, cotton-wool touch and light pressure. The skin was not blistered, although tense and devitalized. After a few days the skin on the tip cracked and I began to peel. Immediately I had removed a small piece of dead skin sensitiveness returned, not only in the area thus uncovered, but throughout the whole finger. I could then detect cotton-wool touch and pinpricks in the areas still covered by devitalized skin. This immediate recovery was nearly but not quite complete. Full recovery occurred gradually in the proximal segment first, and reached the tip about a fortnight from the time of injury.

I deduce that increased tension in the finger, and not any histological damage to the nerve endings, is the main cause of loss of sensation. As I have no book with me at sea which discusses this point I can—until I am contradicted—amuse myself with the idea that this observation is original.—I am, etc.,

M. C. ANDREWS,
April 15. Surgeon Lieut.-Commander, R.N.V.R.

Ergotoxine in Shock

SIR,—With reference to the article on recent air-raid casualties by Dr. Margaret Ball and Mr. George Quist (February 22, p. 273), in which they report that "the results of the treatment of severe shock by replacement of fluid with blood and plasma were disappointing," I beg to suggest the trial, as an additional measure, of intramuscular injections of ergotoxine aethanosulphate 1/120 to 1/60 grain in this condition. Since these doses are regularly used in obstetric practice and in the treatment of migraine they may be employed without fear.

Ergotoxine is an inhibitor of sympathetic overactivity, and has been successfully used by Hassan and Mahommed (*Lancet*, 1940, 1, 1001) as an antidote to scorpion toxin, part of which is a strong stimulant of the sympathetic nervous system. Since we have no recognized drug at present with which to combat shock, the trial of ergotoxine in therapeutic doses in this condition is fully justified.—I am, etc.,

Capetown, April 6. J. WALKER TOMB, M.D.

Whither Welfare?

SIR,—The article on "Whither Welfare?" (May 10, p. 719) deserves most careful attention. The argument of Dr. Cicely Williams that more can be done to prevent disease than by any other method through the sensible teaching of home hygiene and right diet is put forward most convincingly and cannot be gainsaid. The practitioner treats disease but does not prevent it, and the medical research worker seeks for methods for immunization against or cure of disease, but the well-trained welfare worker, by teaching in the home, goes to the root of the whole matter, and, adequately supported, can stop disease appearing. How little the Medical Research Council realized this was shown by the fact that after my retirement it abolished the Department of Applied Physiology at the National Institute of Medical Research.—I am, etc.,

Chalfont St. Peter, May 11. LEONARD HILL.

New British Summer Time: A Criticism

SIR,—May I inquire whether certain disadvantages of the new summer time have been sufficiently considered from the medical standpoint? Speaking for my own district (the North-West), when any large-scale aerial attack has been made the alert has usually been sounded about one hour after black-out time, and I find that most people who do not regularly sleep in shelters have been in the habit of waiting up until this "danger" time has passed before retiring. If we consider the week before the advent of the new system we find that people were retiring about 10.30 p.m.; to-day we find that they are waiting up until 11.30 p.m. or midnight before they consider it safe to retire, and before the longest day arrives the "safe" time will be 12.30 to 1 a.m. So that, even if no raid develops, large masses of the population are missing a substantial proportion of their sleep; in the event of a raid the position is worse, since when the raiders depart (at present 4 a.m. to 4.30 a.m.) these people are left with only three to three and a half hours sleep.

Under the original British Summer Time these people would have retired one hour earlier, and after a long raid would have had an extra hour in which to sleep. I would go even further and suggest that it would be better to have turned the clock one hour backwards to G.M.T. (since the visitations of the Luftwaffe are independent of our own chronometric manipulations). This would time the raids to begin and end earlier, with obvious sleep-saving advantages at either end. From this point of view I venture the opinion that any advantages offered by the new British Summer Time are more than counterbalanced by the impairment of working efficiency through the needless loss of sleep it entails.—I am, etc.,

May 9. LESLIE BALLON.

Universities and Colleges

UNIVERSITY OF SHEFFIELD

The University Council made the following appointments on May 9: *Assistant Lecturer in Mental Diseases*: F. J. S. Esher, M.B., Ch.B., D.P.M. *Junior Demonstrator in Anatomy*: M. Laird, M.B., Ch.B. *Part-time Demonstrator in Anatomy*: Mrs. Mildred John, M.R.C.S., L.R.C.P.

The Council accepted the resignation of Dr. F. E. E. Schneider of the post of assistant lecturer in mental diseases with regret and thanked him for his services to the University.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the Royal College of Surgeons of England, held on May 8, with Sir Hugh Lett, President, in the chair, Mr. J. W. Walker and Mr. T. Harrison Butler were admitted to the Fellowship.

Mr. John Basil Hume was elected a Member of the Court of Examiners.

It was decided that the amount of the Cartwright Prize should be increased from £85 to £100.

The President was appointed, *ex officio*, a member of the Governing Body of the British Postgraduate Medical School for one year.

Diplomas

Diplomas of Membership were granted to the 171 successful candidates named in the report of the meeting of the Royal College of Physicians of London, published in the *Journal* of May 3 (p. 694) and to the following:—

N. Alders, V. R. Arulanandom, J. L. Ballantyne, P. L. N. Bay, M. Bates, R. I. S. Bayliss, A. B. Black, E. M. Cheffins, D. R. Christie, Doris Critchley, Aileen M. Dickins, A. Fessler, J. H. Fodden, H. A. Hashemian, M. Hewitt, M. H. W. Holloway, J. S. Johnstone, Anne E. E. Jordan, J. M. Joshua, H. H. Kennedy, A. Klidjian, Padma Kumar, K. R. Llewellin, T. P. Mann, J. H. G. Morris, M. Roth, Melicent E. Salmon, J. M. W. Sedgwick, Eleanor M. Singer, C. C. K. Smith, J. G. Stubbs, H. Williams, J. A. Williams, Jean K. M. C. Wilson, R. B. Zachary.

Medical Notes in Parliament

Milk Certificates

Mr. GROVES contended on May 7 that the form of certificate for additional supplies of milk to persons suffering from certain diseases was objectionable, in that a doctor was required to certify the precise disease from which the person in need of the additional supply of milk was suffering, and that the certificate had to be handed to the local dairyman, thereby making him and also his employees aware of information which should be strictly confidential. Major LLOYD-GEORGE said the views of the British Medical Association on this procedure had recently been received and were under consideration.

Alien Doctors in Pioneer Corps.—Mr. ERNEST BROWN told Mr. George Strauss on May 8 that the services of alien doctors in the Pioneer Corps were considered for employment in hospitals and institutions equally with others of allied or enemy nationality through the machinery set up by the Central Medical War Committee. Capt. Margesson had given instructions that every facility was to be afforded for their attendance at interviews with employing authorities and for their discharge from the Corps when employment was obtained.

Civil Nursing Reserve Call-up.—On May 8 Mr. GEORGE STRAUSS, in view of the shortage of trained nurses, asked what was the policy of the Government in calling up for service those who have registered their names, at the outbreak of war, on the Civil Nursing Reserve. Mr. BROWN replied that to utilize the services of any trained nurse member of the Civil Nursing Reserve not already in employment he had recently extended the scope of the Reserve to cover almost every type of hospital, including certain special hospitals where the shortage of nurses was acute. Where a trained nurse offers whole-time service without reservation as to place regional Nursing Officers could ordinarily post her without difficulty. This could not always be arranged, however, where the member's offer was restricted either to part-time service or to service in a particular locality or in some other way. Such members were now being approached and asked to offer service not subject to these limitations. The use to be made of their services would depend on the replies.

The Services

R.A.F. AWARDS

The George Medal has been awarded to Flying Officer Richard Garwood Robinson, R.A.F.V.R., and to Corporal John Taylor, R.A.F. The announcement of the awards in a *Supplement* to the *London Gazette* dated May 5, 1941, said: "One day in February, 1941, an aircraft crashed just beyond the boundary of an aerodrome. Flying Officer Robinson, medical officer at the station, was at the scene of the accident almost immediately, and was first seen crawling through heavy smoke and fumes, but when he had nearly reached the wreckage he was forced back owing to an explosion of one of the main petrol tanks. Undeterred, however, he returned to the seat of the fire, which was around the pilot's cockpit, where he was joined by Corporal Taylor, who had been playing football and had run to the crash clad only in his football attire. Together they attempted to extricate the only remaining member of the aircraft. To assist them in their efforts a foam apparatus was turned directly on them. Although petrol and oil tanks, ammunition, and verey lights were exploding Flying Officer Robinson and Corporal Taylor persisted in their efforts, and finally extricated the body. Both displayed great courage and a complete disregard for their own safety, and although both suffered from the effects of the foam sprayed on them it undoubtedly saved them from being gravely burned. On a previous occasion Flying Officer Robinson displayed the greatest courage in attempting to rescue the members of a burning aircraft, in spite of exploding bombs and ammunition."

CASUALTIES IN THE MEDICAL SERVICES

ROYAL ARMY MEDICAL CORPS

Prisoner of War

Temporary Lieut.-Colonel John Chiene Mackay, M.C., T.D.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

Measles was the only common infectious disease, with an increase of 921 cases, which showed any considerable variation from the number of notifications of the previous week. The counties with an increased incidence were generally distributed over the country. The outstanding rise occurred in Birmingham C.B., where the number of cases notified went from 411 to 586. The greatest decrease was in Northamptonshire, where the notifications were one-third of those of the preceding week. There were 24 fewer notifications of whooping-cough in England and Wales. In Scotland there was also a fall in the incidence of whooping-cough. Glasgow accounted for 150 of the 219 cases.

Although the rise in the number of cases of scarlet fever was only 33 for the whole of England and Wales, almost half of the counties reported increases. In Middlesex notifications rose from 19 to 60, and in Essex from 34 to 50.

The number of notifications of diphtheria during the week did not vary greatly in the individual counties, compared with the preceding week. It has been more prevalent in the North Country than in the South.

Cerebrospinal fever, after the fall in notifications during the previous week, returned to the level around which it had been fluctuating since the week ending March 15. The increase of 44 cases was made up mainly of isolated cases spread over the country, but multiple cases were reported from areas that had no cases in the preceding week. The chief of these districts were Durham, South Shields C.B. 5, Bishop Auckland U.D. 4; Yorkshire, East Riding, Kingston-upon-Hull C.B. 7.

The epidemic of dysentery in Hemel Hempstead M.B., Herts, is decreasing: 30 fresh cases were reported in the whole county during the week as compared with 50 in the preceding week. The largest increases were from Lancashire, Lancaster M.B., where notifications rose from 1 to 12, and Surrey, Coulsdon and Purley U.D., from 0 to 14. Dysentery reappeared in Essex, Colchester M.B., after a lapse of one week; 4 cases were notified in this area, which recently had a severe outbreak. The number of cases in Lancashire, Whiston R.D., where an outbreak has lasted over two months, increased from 5 to 11.

No. 15

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended April 19.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	(b)	(c)	(d)	(e)	1940 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	326	18	77	4	14	330	22	72	4	10
Deaths	1	1	7				2	4		
Diphtheria	877	46	222	36	27	712	23	231	52	39
Deaths	1	1	4	1	2	22	1	6	1	—
Dysentery	131	21	32		—	44	3	30		—
Deaths		—			—		—	—	—	—
Encephalitis lethargica, acute	3	—	—	—	—	6	—	1	—	—
Deaths		—	1				—	1		
Enteric (typhoid and paratyphoid) fever	26	2	45	7	2	36	1	10	2	1
Deaths	1	1	1	1	—	1	—	—	—	—
Erysipelas			54	9	1			48	4	4
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years	28	4	4	3	2	2	6	6	5	6
Deaths										
Measles	13,951	319	106		10	4,013	29	133		165
Deaths ..	16	—	—	1	—	5	—	1	2	2
Ophthalmia neonatorum	73	9	22	—	—	44	6	28	1	—
Deaths										
Pneumonia, influenzal*	1,155	50	20	4	2	815	46	121	6	6
Deaths (from influenza)	51	6	4	5	2	46	4	7	2	2
Pneumonia, primary ..	—	—	1336	16			62	201	15	
Deaths		30		12	10				9	11
Polio-encephalitis, acute	—	—				1	—			
Deaths		—					—			
Poliomyelitis, acute ..	7	—	—		2	4	—	1		—
Deaths		—					—	—		
Puerperal fever	1	1	10	4	2	-	—	7	1	1
Deaths		—					—			
Puerperal pyrexia ..	146	11	25		2	143	4	14		1
Deaths	—	—								
Relapsing fever ..	—	—			—	—	—			—
Deaths		—								
Scarlet fever	1,056	50	125	38	25	869	46	121	49	77
Deaths	—	—	2	—	—	1	—	—	—	1
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	1	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough ..	3,568	96	219	1	6	567	17	37		19
Deaths	36	—	12		—	2	—	—	—	2
Deaths (0-1 year) ..	429	41	77	29	20	378	50	77	27	32
Infant mortality rate per 1,000 live births)										
Deaths (excluding still-births)	6,744	1,154	744	233	251	5,134	872	719	208	167
Annual death rate (per 1,000 persons living)			15.3	15.5	22.5			15.5	13.3	14.7
Live births	4,984	345	557	277	159	3,504	96	573	367	282
Annual rate per 1,000 persons living ..			12.1	13.5	14.2			14.5	24.5	22.1
Still-births ..	213	14	50			254	42	48		
Rate per 1,000 total births (including still-born)			53					44		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Medical News

A general meeting of the Medical Society for the Study of Venereal Diseases will be held at 11, Chandos Street, W., on Tuesday, May 27, at 2.30 p.m., when Dr. H. M. Hanschell will give an address on "Venereal Buboes."

Field-Marshal Sir Philip Chetwode, on behalf of the War Organization of the Red Cross and St. John, is opening this week the first convalescent hospital for civil defence workers. This hospital, in Buckinghamshire, was planned by Lord Horder and Mrs. Joan Woollcombe. It accommodates twenty-five beds for men and twenty-five for women, and the cases admitted will include ailments as well as shock and wounds. Its main purpose is to restore A.R.P. workers to health after illness. Patients will be selected through the country hospitality scheme, which continues to act as an independent body within the machinery of the Red Cross War Organization.

At the annual general meeting of the North of England Ophthalmological Society, held at Sheffield, Mr. H. Haward Bywater of Liverpool was elected president and Mr. Percival J. Hay of Sheffield secretary.

The Palestine Conference of Jewish Physicians was recently held in Tel-Aviv, when Arab, English, and military physicians were among the thousand delegates. The conference was greeted by representatives of the Government, the Municipality, and Jewish institutions. The discussions were mainly devoted to diseases of the blood.

A new division of chemotherapy has been formed in the National Institute of Health of the United States Public Health Service to be under the direction of Dr. William H. Sebrell, jun. The new unit will be concerned with research on sulphanilamide products, and with new synthetic drugs with anti-malarial properties, in order to make the United States independent from the Dutch East Indies supply of quinine. The division will have quarters at the National Institute of Health in Bethesda, Maryland. The building will also be the headquarters of the divisions of chemistry and zoology.

Dr. C. L. Herman, who died at Wynberg, Cape Colony, in August, aged 81, bequeathed £40,000 to the medical faculty of Capetown University for research work.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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LETTERS, NOTES, ETC.

Chemotherapy in Otitis Media

DR. L. B. SURTON (Surbiton) writes: I was interested to read the article on chemotherapy in acute otitis media by Dr. J. B. Jessiman (March 15, p. 399). Before the use of chemotherapy in acute otitis media the results of previous treatment, with local application, drops, etc., were slow and obscure, and one was inclined to send such cases more frequently for consultation to hospitals for fear of complications, such as mastoiditis, etc. But with the advance of chemotherapy complications seem to have diminished. For the last eighteen months or so about nineteen cases of acute otitis media, ranging from children to adults, were treated at home with sulphapyridine with favourable results, and only one child, aged 2 years, was sent to hospital after three days' treatment—for fear of mastoiditis. This patient was kept at hospital and continued with sulphapyridine with good results and recovery. I have been using rather smaller doses of sulphapyridine than Dr. Jessiman reports, and I think I shall increase the dose in future. However, in most cases of acute otitis media, as soon as chemotherapy is started, there is evidence of improvement by the next day, in the lowering of the fever, less pain and discomfort, and on inspection a gradual resolution of the inflammation, congestion, and the bulging of the drum or disappearance of vesicles on drum. Sometimes the "bulging" will burst and the discharge of pus will clear up in about fourteen days or so. I always order to be instilled in the ear, after the pus is cleared out, guttae glyc. ac. bor., and the application of some form of heat—in adults the ear over a jug of hot water for steam. Recently an adult aged 50 developed bilateral otitis media after a mild attack of tonsillitis. Sulphapyridine tablets were given and temperature went down next day. The left drum developed a small perforation which healed in about a week. The right drum took rather longer to clear up. I have not treated many cases of chronic otitis media, but in the few cases where chemotherapy was employed benefit was seen. I am now intending to try on some chronic otitis media cases with old standing discharges the principle of the present-day treatment of war injuries—that is, packing the ear canal with powdered sulphapyridine; and from the results obtained in packing some septic ulcerated legs it seems probable that benefit will follow.

Antiseptic Snuffs

DR. F. G. CAWSTON writes from Durban: Cleansing of the naso-pharynx with warm saline immediately relieves a sore throat, but most popular remedies are irritating to the mucosa and both lotions and oils may be unduly retained, so that further use of powders is indicated. Investigations with antiseptic snuffs, as reported in the *Journal* of February 1 (p. 145), are of great interest. It is, however, probable that some sulphanilamide compound may have to be taken orally to cure a deep-seated sinusitis associated with recurring colds (and causing tinnitus and deafness) and this may well be combined with appropriate vitamins.

The War and Opium

The twenty-fourth report of the Advisory Committee of the League of Nations on Traffic in Opium made last year to the Council drew attention to the possible repercussions of the war on national and international supervision of narcotic drugs in accordance with the Conventions, and on the activities of the committee. It stressed the "bitter lesson of experience" in the last war with the marked recrudescence of drug addiction and of illicit traffic. A resolution was adopted urging on the Governments concerned the imperative need for continuing, without relaxation, the international duties undertaken by the contracting parties. The instruction to the committee by the Council and the Assembly to convene a conference on the limitation of the cultivation of the poppy and the production of opium remains unfortunately in suspense, although the appointment of a new assessor (Mr. W. Gaskell) to prepare the work for this conference is announced. Reviewing the completed returns for 1938 of the world traffic in narcotics, the Advisory Committee concludes "that the world manufacture and consumption of the five principal drugs correspond to its legitimate requirements." These are, for the year: 42.7 tons of morphine, 611 kilos of heroin, 27.5 tons of codeine, 2.5 tons of dionine, and 3.8 tons of cocaine.

The Salvation Army's War Work

The red shield bearing the name of the Salvation Army has become a well-known emblem in every part of the present "battlefield." The principle on which this great voluntary organization is working is to go where the need is greatest. One of the principal features of its war work is the provision of mobile canteens. In the early part of the war a fleet of these operated among the Expeditionary Force in France. Since Dunkirk they have been at work in this country among Service men and also among civilian sufferers. Thus the announcement of the raiding of Coventry was accompanied by the statement that the first relief organization to arrive in the city after the bombardment was the Salvation Army with its mobile canteens. At the larger shelters in London and elsewhere the Salvation Army is one of the most conspicuous of the voluntary bodies distributing food at night and in the early morning. In an illustrated booklet which reaches us, describing the service on many fronts, it is related that in the early nights of the raiding a young woman officer of the Salvation Army offered to set up a first-aid post in a London tube shelter, but her proposal was coldly received by the stationmaster, who said that if she cared to mix with the crowd she was at liberty to do so. The opportunity soon came for her to give first aid to a confinement case and to a case of acute appendicitis, and to accompany both cases in the ambulance to hospital, with the result that the stationmaster asked her to carry out her original suggestion, and himself fitted up an ample space as a first aid post.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY MAY 17 1941

MATTERS REFERRED TO DIVISIONS

British Medical Association

ANNUAL REPORT OF COUNCIL 1940-1

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Owing to the increasingly severe restriction on paper the Annual Report of Council, as adopted by the Council on April 23, has been shortened for publication, and for the same reason the Financial Statement appears in abbreviated form.

PRELIMINARY

1. Inevitably the continuance of the war has of necessity curtailed many of the Association's normal activities, both central and local. But every effort has been made, with the help of Chairmen of Committees and, in some cases, Executives of the Committees to safeguard the interests of the profession.

2. THE ROLL OF HONOUR includes the names of twenty-seven medical officers killed on active service, eighteen officers who died on active service, and seventeen civilian members, four of them medical women, killed through enemy action. The Association also has to deplore the loss of 333 other members.

3. The membership of the Association at the end of March, 1941, was, notwithstanding war conditions, 39,466.

4. In the belief that national post-war reconstruction will involve profound changes in medical practice the Council, in co-operation with the English Royal Colleges and the Scottish Corporations, has set up a Medical Planning Commission to study wartime developments and their effects on the country's medical services both present and future. The Commission will hold its first meeting very shortly.

5. The Sir Charles Hastings Clinical Prize for 1941 has been awarded to Dr. E. P. Edmonds (Aylesford). The Council has decided that the Sir Charles Hastings Clinical Prize, the Katherine Bishop Harman Prize, the Middlemore Prize, the Stewart Prize, and the Association's Scholarships and Grants shall not be awarded during the remainder of the period of the present emergency.

6. The Council is discussing with the Ministry of Health the advisability of providing further instruction for the medical profession in the treatment of gas casualties.

7. The Council has been instrumental in forming a Medical War Relief Fund with the object of assisting, by way of loans or grant, practitioners who are in difficulty or distress in consequence of damage by enemy action to their surgeries and equipment. A full report of the working of the Fund was published in the *British Medical Journal* for April 12, 1941, page 566.

FINANCE

8. The accounts for the year ending December 31, 1940, the first full year under war conditions, show the continuing sound financial position of the Association.

Balance Sheet

Provision for war risks insurance has been made and the various reserve funds have been maintained at a high level. Since the close of the financial period steps have been taken to increase the sinking fund insurance policies on the leasehold premises of the Association by £100,000. A General Contingency Reserve has been established to provide for increased taxation, additional war damage contingencies, commitments for extension of premises, and other unusual expenditure.

The amounts certified by the architect and paid to the contractors for the erection of the new extensions totalled £126,227. This year a further sum of £13,100 has been paid to the contractors. Any further immediate liability is limited to the cost of partitioning and decoration carried out for incoming tenants. £5,000 has been written off the Extension of Premises Account for depreciation.

The remaining investments in stocks were sold during the year to meet some part of the cost of the building extensions, showing a profit of £2,264, which has been added to the Surplus Account. The Reserve against Commitments for Extension of Premises represented by certain of these investments has therefore been added back to the Surplus Account, which, on December 31, 1940, totalled £319,650.

The value of the stock of *Journal* paper held at the end of the year was £5,398. This is considerably larger than usual because of the substantial increase in the cost of paper. In order to meet any emergency, the Journal Board has purchased the full ration of paper allowed by the Ministry of Supply.

Income and Expenditure Account

Despite the reduced subscription now enjoyed by an increased number of "Service" members and a further increase in the free list of members of over fifty years' standing, the revenue from subscriptions for the year increased by more than £500. Rents remained stationary.

Expenditure was diminished by £27,000. The War Damage Act requires the insurance of buildings against damage arising during the first two years of the war by the payment of a premium to be met in five annual instalments. It is estimated that the premium for the insurance of the buildings will amount to £6,000. There is provision in Part II of the Act for the compulsory insurance by the Board of Trade of movable plant, office furniture, and equipment against war damage during the same period; it is estimated that the premium will amount to £225.

"Journal" Account

In spite of severe restriction of the size of the *Journal* by the Ministry of Supply's control of paper, which reduced the space available for advertisements, the revenue from advertisements has been more than maintained owing to an increase of 50% in the rates for space made in May, 1940. Though many production costs have increased, particularly the cost of paper, these have been more than offset by the smaller *Journal*. More copies were printed, but the net cost of the *Journal* to the Association has been reduced to one-quarter of that of the previous year, a saving of £12,000.

Estimate of Receipts and Expenditure for 1941

Whilst it may be confidently assumed that the membership of the Association will be maintained during the year, there will be some diminution in the average rate of subscription

due to further increase in the number of members claiming the "Service" rate. This decrease will probably be more than offset by the increase in rents obtained from lettings in the new Northern extension. The revenue from investments will be reduced during the year. The income for 1941, therefore, is estimated to reach £106,000.

On the Expenditure side the policy of restricting the central activities of the Association must perforce be continued, with perhaps some relaxation. The important work of the Medical Planning Commission will begin in May. With a continuing rise in production costs it is too much to hope that the remarkably low cost of the *Journal* to members can be maintained. Increased taxation, including a further sum for War Risks Insurance beyond the amount set aside in the 1940 accounts, must be provided for.

Considering these factors, it seems likely that the total ordinary expenditure will reach £90,000, but it must be understood that this is an approximate figure which may be varied by changes in policy necessitated by war conditions. To this sum must be added at least £7,000 for depreciation of premises, library, and furniture, £3,500 to Sinking Fund for the redemption of leasehold premises, £1,500 for loss on exchange on Dominion currencies, £2,000 for dilapidations and redecorations, making a grand total of £103,500, and an estimated credit balance of £2,000.

CENTRAL MEDICAL WAR COMMITTEE

9. The Council has received the following Report of the work and activities of the Central Medical War Committee:

In its last Annual Report the Committee described the recommendations it had made on the subject of conscription and stated that its proposals had been accepted by the Government. The machinery evolved for the compulsory recruitment to H.M. Forces of practitioners within the registered age groups is working smoothly. The Committee has appointed a Services Committee to deal with the recruitment of individual practitioners to the medical branches of the Armed Forces; to consider recommendations of Local Medical War Committees on individual recruitment, representations against these recommendatons, and all other cognate matters.

Under the present arrangements practitioners are recruited to the Services through two channels: (*a*) practitioners whose names appear in the registers of Local Medical War Committees, and (*b*) practitioners dealt with centrally by the Central Medical War Committee, which consults Local Medical War Committees in appropriate cases. The second category comprises "young practitioners," the great majority of whom take junior hospital posts and who are recruited on the termination of those appointments. A special subcommittee has been appointed to advise on the recruitment of "young practitioners." The arrangements for the recruitment of volunteers for H.M. Forces continue.

Quotas

10. In order that practitioners registered under the National Service (Armed Forces) Act shall be drawn for recruitment to H.M. Forces fairly from the different areas, the Committee periodically, as the needs of the Services demand, allots quotas of practitioners to be provided by each Local Medical War Committee. In assessing a quota the Committee takes into consideration the type of area—i.e., whether it is a reception, evacuation, or neutral area—the number of practitioners who have already been recruited from the area, and the number, distribution, and classification of the medical profession practising in the area.

Hospital Appointments

11. In co-operation with Local Medical War Committees throughout the country and the Committee of Reference in London, the Committee has approved junior and senior wartime establishments for voluntary and municipal hospitals. Each hospital is allotted a prescribed number of A appointments (i.e., those house posts which can be occupied by newly qualified practitioners), of B2 appointments (i.e., posts which cannot be occupied by practitioners without previous experience), and of B1 appointments, which are senior posts (typically R.S.O., R.M.O., registrar, chief assistant at a voluntary hospital, and posts with a tenure of one year or longer carrying a salary of £350 per annum, with emoluments, or more, at a municipal hospital) The Young Practitioners Subcommittee is concerned with the recruitment of R practitioners holding A and B2 posts as they complete their appointments. The recruitment of holders of B1 appointments is dealt with in the first instance by the Local Medical War Committees in the Provinces and by the Committee of Reference in London, the recommendations of these Committees being passed to the Central Medical War Committee.

The Committee would like to take this opportunity of expressing its gratitude to hospital authorities for their valuable co-operation in preparing the establishments and in keeping the Committee informed of changes in the tenure of appointments.

Civilian Reserve List

12. The Committee has continued to maintain its list of practitioners who are available to assist in relieving the pressure of general practice wherever they may be required. The practitioners thus offering their services are, generally speaking, those whose practices have disappeared or been reduced by reason of evacuation or enemy action and retired practitioners who are willing to assist during the emergency. The civilian reserve list has been of great value in providing help for general practitioners in reception areas and for partnerships where one or more of the partners have joined H.M. Forces. The steady recruitment of practitioners to the medical branches of H.M. Forces and the growing need for doctors for civilian medical work have seriously depleted the Civilian Reserve List, and it is no longer possible for the Central Medical War Committee to undertake the provision of substitutes for practitioners joining the Services.

The Committee continues to maintain a list of practitioners who have intimated their availability for temporary public health work.

Emergency Medical Service

13. The Central Medical War Committee has appointed an Advisory Emergency Hospital Medical Service Committee to consider questions relating to the E.M.S. This Committee recommended to the Ministry of Health certain modifications in the terms of service of Class III officers, and its proposals were accepted in the main by the Ministry. The revised terms, which affect sessional fees, mileage, and the occupied-bed basis, were published in the *Supplement* to the *British Medical Journal* for November 2, 1940. The Committee also arranged with the Ministry of Health that the guaranteed period of employment of Class I and Class II officers should be extended to September 1, 1941.

General Matters

14. Apart from the detailed work of recruitment and the consideration of matters affecting the supply of, and demand for, medical personnel the Committee has dealt with numerous general questions. Among these are the question of compensation for civilian medical practitioners killed or injured in civilian defence duties, a question which the Committee still has under consideration in spite of the repeated refusal of the Ministry of Health to make any distinction between medical practitioners and other members of civil defence organizations; the appointment of honorary medical officers to battalions of the Home Guard; the rank of consultants to the Army

Conference of Local Medical War Committees

15. A large gathering of representatives of Local Medical War Committees was addressed by the Minister of Health, the Rt. Hon. Ernest Brown, M.P., on February 21, 1941. The Minister dealt with current problems in connexion with the recruitment of medical practitioners to H.M. Forces. At the close of his address questons were asked and answered.

Alien Practitioners

16. The question of the employment of friendly alien medical practitioners during the war has recently come into prominence. On the one hand, the recruitment of large numbers of British practitioners to H.M. Forces has resulted in a shortage in the medical services normally available to the civilian population. On the other hand, there are in this country at the present time a considerable number of alien practitioners well qualified in their own country who are anxious to make some contribution to the Allied war effort and at the same time to keep fresh their medical skill and their

contact with the progress of medicine. The Home Office has made arrangements for the temporary registration during the war of suitably qualified alien practitioners and for their employment in subordinate posts in hospitals. The Central Medical War Committee has undertaken the task of keeping a register of these approved practitioners and of providing their services to those hospitals requiring them.

Work of Local Medical War Committees

17. The Committee would like to take this opportunity of expressing its most sincere appreciation and thanks to the members of the Local Medical War Committees, and especially to the honorary secretaries, for the magnificent work they are doing on behalf of the profession. All their work is voluntary, and in many cases it is done at great personal sacrifice. The Committees form the link between the Central Committee and the individual members of the profession, and as such have been called upon to perform many arduous duties, often difficult and urgent in nature. Without their help the profession's war machinery could not function efficiently, and the Central Committee and every member of the profession are deeply indebted to them.

General

18. The Committee is aware that now that the available pool of practitioners has been seriously depleted its machinery cannot function with the fullest efficiency until there is established a priority or similar machinery to determine the priority of the various demands now being made on the medical profession. It has urged, and is urging, the taking of immediate steps to establish such a machinery.

BRITISH MEDICAL JOURNAL

19. Production and distribution of the *Journal*, though beset by many difficulties, have continued during the second year of war. The air raids upon London and the shortage of paper had to be contended with. Conditions of life and work during the heavy bombardments imposed a severe strain upon all engaged in producing the *Journal*. To meet the reduction in paper supplies, and the high cost of paper and postage, economy of space is effected wherever practicable, and the over-all size of the *Journal* has been kept down. The inflow of original articles shows little decline in volume and far exceeds the capacity to print them. The number of letters for publication continues very large indeed, and correspondence has occupied much space so that members may have full opportunity of recording experience and putting forward their views on the great variety of topics that keenly interest the profession in wartime. The principle followed in choosing material for publication is to give preference to that which has topical interest and value, and to afford medical men and women information and guidance which will increase their ability to serve the country. Thus the pages of the *Journal*, week by week, play an indispensable part in promoting the profession's war effort and in giving it a forum to discuss the problems of to-day and to-morrow. The *Supplement*, though much cut down in size, gives prominence to War Notices issued by the Central Medical War Committee and publishes miscellaneous information which must be brought to the attention of practitioners in wartime when other means of communication and discussion are limited or cut off. Advertisements have diminished in bulk, but that has been more than offset by the higher charges for advertising space.

Early last autumn, when things were at their worst in London, the *Journal* ended its 100th year of continuous publication, and the event was signalized by a Centennial Number dated October 5, 1940. This, though of modest size and scope, contained some historical matter and many gratifying messages of congratulation and good will from leaders of the profession at home and over-seas.

GENERAL PRACTICE

Increase in Medical Fees

20. A few Divisions have recommended their members to increase their private fees in view of the rising costs incurred in medical practice, and the Council considered whether the time had arrived for making a central recommendation on these lines. The Council has adopted the following recommendation: "That an increase of fees has been rendered inevitable by rising costs and that practitioners in general practice be recommended to increase their private fees, including contract fees, by not less than 20%."

Divisions are advised to take the necessary steps to give effect to this recommendation.

First-aid Posts

21. The Council has dealt with a number of questions relating to fees for medical practitioners attending first-aid posts in consequence of an air-raid warning. One question was the fee payable to a practitioner who attended at the first-aid post for a long period during the night—that is, extending over midnight. It has been agreed with the Ministry of Health that the definition of the term "any one day," for which a maximum fee of 3 guineas is payable, shall be from midnight to midnight, anything less than one hour's attendance on either side of midnight not being reckoned as entitling a practitioner to a fresh day's sessional fee.

Hitherto there has been no maximum fee that a practitioner may earn in sessional fees for duty at first-aid posts, although Class III officers in the E.M.S. are limited to an overriding maximum of 150 guineas in any six months. The Ministry proposes to apply this maximum to practitioners earning sessional fees at first-aid posts. The Committee has agreed to this proposal provided that the daily limit of 3 guineas is withdrawn.

Ministry of Pensions Medical Boards

22. The Council is making strong representations to the Ministry of Pensions against the inadequacy of the fees at present paid to medical practitioners acting as medical officers on the Ministry's medical boards.

PUBLIC HEALTH

Public Health Medical Officers and Wartime Cost of Living Bonus

23. A number of local authorities have had under consideration the payment of a cost of living bonus to their staffs. The Ministry of Health, on receiving applications from local authorities to apply the Whitley Council scale in the case of certain medical officers of health and other officers whose salaries are subject to Ministry approval, refused to sanction bonus payments to officers in this category earning more than £200 a year, the maximum to which the Civil Service bonus applies. The Association made representations to the Ministry that its action involves unfair discrimination between local authority officers of comparable status. The Ministry in reply stated that further consideration had been given to this matter in the light of the representations made and that the Minister had decided that he would not be justified in continuing to withhold his approval in the case of the particular officers concerned where the proposal is to pay them the bonus being paid already to other employees of the same authority. The Minister is accordingly prepared to sanction the payment of such bonuses to the public health officers referred to in areas where the local authority has granted a cost of living bonus to its staff. The Minister's decision, while it removes unfair anomalies in the relevant remuneration of local authority employees, does not reflect any approval in principle of the particular bonus scales which a particular authority may have adopted.

Vacancies during Wartime in the Whole-time Public Health Service

24. In April representatives of the Association and of the Society of Medical Officers of Health discussed with officers of the Ministry of Health the desirability of wartime appointments in the Public Health Service being filled on a temporary basis only for the duration of the war. It was urged that if permanent appointments to vacancies and new posts were made it would be prejudicial to those possible candidates who were serving with the Forces and might discourage others from offering themselves for commissioned service. While recognizing that local circumstances might determine policy in individual cases, the Ministry was urged to issue a circular to local authorities advising them in general to fill wartime public health appointments on a temporary basis. The Minister replied that while he shared the anxiety of the Association

and of the Society that nothing should be done which would unnecessarily prejudice the prospects of promotion or of future appointment of officers absent on national service, he felt that the decision whether to make a temporary or a permanent appointment in an individual case must be left to the responsible local authority to decide in the light of the circumstances. Wherever the matter comes before him for approval, however, he will certainly for his part place no obstacle in the way of a proposed temporary appointment in any appropriate cases. The Association's views have been approved in principle by the County Councils Association, the Urban District Councils Association, and the Rural District Councils Association.

Application of Askwith Memorandum to Temporary Whole-time Wartime Appointments

25. The Council has considered the application of the Askwith Memorandum salaries to (1) temporary whole-time public health and A.R.P. appointments, (2) hospital appointments within the Emergency Medical Service. The Council has authorized the acceptance for publication in the *British Medical Journal* of advertisements for temporary public health appointments offering the appropriate minimum commencing salary laid down in the Askwith Memorandum without increments. In connexion with advertisements for certain resident house officers at salaries less than the scale rate, the Council has not insisted upon the usual limitation of one year as the position is almost completely safeguarded by the recruitment procedure of the Central Medical War Committee.

The Ministry of Food National Milk Scheme

26. The Council has had under consideration the National Milk Scheme introduced by the Ministry of Food under which milk is available free or at reduced cost to expectant and nursing mothers and children under 5. It appears that in a number of areas the Medical Officer of Health or a member of his medical staff has been appointed local Milk Officer and that the Ministry has approved such appointments. The Council has informed the Ministry of Food that the Association takes the strongest exception to the practice of appointing Medical Officers of Health as Milk Officers for the purposes of the National Milk Scheme on the grounds that the scheme cannot be regarded as a health measure, but that it is primarily a scheme for the distribution of an essential foodstuff free or at a low price.

The Council has made representations to the Ministry of Health urging that the arrangements for the distribution of dried milk under the National Milk Scheme, which are not subject to medical supervision, should be administered separately from the arrangements for the issue of dried milk at local authority welfare and maternity centres, which are subject to medical supervision.

Salaries of Part-time Medical Officers of Health engaged in A.R.P. Work

27. As a result of the war many part-time medical officers of health have been called upon to undertake much increased work in connexion with A.R.P. and evacuation schemes. To carry out these additional duties it has been necessary for such officers to devote an increasing amount of time to their official work, and in many cases this has not been accompanied by a corresponding increase in remuneration. The Council supports the policy of increased remuneration for part-time medical officers of health whose duties have been materially increased as a result of A.R.P. and evacuation schemes without a corresponding increase in salary. In this connexion it is noteworthy that where it has been shown that a part-time medical officer of health is required to devote additional time to his duties on account of A.R.P. and evacuation work the Ministry of Health has approved for the purposes of grant applications by local authorities for an appropriate increase in his remuneration.

NATIONAL HEALTH INSURANCE

Insurance Capitation Fee

28. An application was made to the Ministry of Health earlier in the year for a wartime increase in the insurance capitation fee on the grounds of increased cost of living and practice expenses. The Ministry's reply is that legislation would be necessary to provide increased remuneration for insurance practitioners; that the cost of living part of Committee's claim involves a far-reaching principle of Gov ment policy from which it is impossible to depart until sim concessions are made generally, and that in regard to prac expenses the increase is considered to be too small to jus asking Parliament to amend the present financial structur the N.H.I. scheme. It has been decided to pursue the a cation on the ground of increased practice expenses.

Central Mileage Fund

29. The Ministry's reply to the Committee's application an increase in the insurance capitation fee covers also application for a wartime increase in the Central Mileage Fu The issue here is purely one of increased practice, an being pursued by the Insurance Acts Committee on this ba

Dispensing Capitation Fee

30. Negotiations with the Ministry of Health for a wart revision of the dispensing capitation fee resulted in the fe 2s. 6d. being increased to 3s. as from October 1, 1940.

Medical Benefit for Dependants of Men in the Forces

31. Repeated representations have failed to secure a mo cation of the Government's decision not to make provision medical benefit for the dependants of men in the Ar Forces. The view held by the Government is that the proved financial position of Service men and their dependa enables them to provide necessary medical attention for dependants without Government assistance.

Regional Medical Service: Re-examination of Members of Approved Societies

32. Following the suspension of the Regional Med Service medical practitioners who are asked by Appro Societies to undertake the re-examination of members h been advised that the fees to be accepted should be not than:

	£ s.
For an individual case	10
For a session of not more than two hours	2 2
For an examination at the insured person's house	1 1

* Plus mileage beyond two miles from the doctor's surgery.

National Formulary

33. The Ministry of Health has appointed a small commit on which the Insurance Acts Committee is represented, to sider the preparation of a wartime *National Formulary*, wh will take account of difficulties created by the war in obt ing certain drugs.

INDUSTRIAL HEALTH COMMITTEE

34. In view of the increasing importance of medicine the industrial field the Council has appointed a special C mittee (1) to further the co-ordination of industrial me practice with other branches of medical practice, in partic with general practice and the public health and hosp services; (2) to co-operate with Government Departments voluntary organizations in all measures affecting health industry.

The Committee has issued a statement for the guid of medical practitioners relating to salaries and condit of service for wartime industrial medical appointments. now proceeding with the preparation of its report.

SCOTLAND

Scottish Committee

35. Dr. Thomas Fraser, Aberdeen, and Dr. J. McCutcheon, Glasgow, were reappointed chairman deputy chairman respectively for session 1940-1. At a m ing of the committee held in December, 1940, it was ag that under existing conditions the committee would not at its accustomed intervals; but that meetings woul summoned as circumstances demanded.

The Chairman's, Highlands and Islands, and Hospitals committees have been reappointed so that any urgent ma can be duly considered and dealt with.

Maternity Services (Scotland) Act, 1937

36. Schemes under the above Act are now in operatio thirty-eight local authority areas. At a meeting of

Scottish Committee held in January, 1941, it was reported that the Corporation of Glasgow had submitted a scheme for a whole-time maternity service in the city. The Department of Health have informed the Scottish Secretary that the Glasgow Division will be afforded full opportunity of discussing the matter with the Department before any such scheme is officially approved.

Out-patient Departments : Royal Infirmary of Edinburgh

37. Following consultations between representatives of the Medical Committee of the Board of Managers of the Royal Infirmary of Edinburgh, representatives of the Edinburgh and South-East of Scotland Branch of the Association, and the Scottish Secretary, the Board of Managers have approved of the reorganization of the out-patient departments of the hospital on the lines approved by the British Medical Association.

Scottish Central Medical War Committee

38. Under war conditions a great part of the activities of the Scottish Office has been diverted to meeting the requirements of the fighting Services and the Emergency Medical Service for medical officers and other matters connected with the war effort. Under the voluntary scheme the Scottish Central Medical War Committee, on which the Scottish Committee of the Association is fully represented, was able to meet all the demands made. Local Medical War Committees in Scotland have been asked to supply, under the compulsory procedure, a quota of eighty practitioners for the months of March, April, and May, 1941. The Scottish Central Medical War Committee deals directly with all questions regarding the recruitment of R practitioners who have been qualified not more than two years and all holders of A, B2, and B1 posts. Steps have been taken to secure periodic returns regarding the holders of these posts, and to secure the fullest co-operation between the hospital authorities and the Scottish Central Medical War Committee in matters affecting the recruitment of members of hospital staffs.

Instruction in Treatment of Gas Casualties

39. Courses of instruction have recently been held in the various centres in Scotland dealing with recent developments in the treatment of gas casualties.

H. S. SOUTTAR,
Chairman.

BALANCE SHEET, December 31, 1940

1939	LIABILITIES	£	s.	d.	1940 £	s.	d.
	Creditors for:—						
	Subscriptions paid in advance	965	13	11			
	Advertisements ditto ...	823	1	10			
	Publishing ditto	1,082	12	1			
	Contributions	91	14	6			
	Capitation Grants	15	0	0			
	Production of Journal, Establishment expenses, etc. ...	11,747	14	6			
	Special Journals Account ...	1	11	2			
	Library—Prepaid cards in hands of borrowers	107	15	3			
	Provision for War Risks Insur.	6,000	0	0			
15,535					20,835	3	3
	Reserve to meet Dilapidations and Redecorations:—						
	Balance at December 31, 1939	10,927	16	7			
	Add Transfer from Income and Expenditure Account	3,000	0	0			
10,928					13,927	16	7
	Sinking Fund for redemption of Leasehold Premises:—						
	Balance at December 31, 1939	23,286	12	6			
	Add Transfer from Income and Expenditure Account	2,433	6	8			
23,287					25,719	19	2
	Reserve to meet loss on transfer of Colonial Subscriptions:—						
	Balance at December 31, 1939	1,802	12	11			
	Less cost of transferring Colonial Subs. during 1940	1,449	13	8			
		352	19	3			
	Add Transfer from Income and Expenditure Account	1,500	0	0			
802					1,852	19	3
	General Contingency Reserve:—						
—	Transfer from Income and Expenditure Account				15,000	0	0
	Loans from outside bodies:—						
	Secured	25,000	0	0			
	Unsecured	16,100	0	0			
20,100					41,100	0	0
—	**Overdraft at Bank**				7,524	17	6
	Surplus Account:—						
	General balance at Dec. 31, 1939	304,592	9	0			
	Add profit on sale of investments	2,264	19	9			
		306,857	8	9			
	Add transfer from Reserve against Commitments for Extension of Premises ...	11,985	16	11			
		318,843	5	8			
	Add Balance transferred from Income and Expenditure Account for year ended December 31, 1940	807	3	3			
304,592					319,650	8	11
					£445,611	4	8

1939	ASSETS	£	s.	d.	1940 £	s.	d.
	Leasehold Premises (at cost less amounts written off) —						
	Tarbtock Square and Upper Woburn Place—						
	Balance at Dec. 31, 1939 ...	260,043	5	2			
	Less amount written off for depreciation	3,000	0	0			
260,043					257,043	5	2
	Extension of Premises Account:—						
	Balance at December 31, 1939	47,297	6	10			
	Add Expenditure during the year on Extensions as certified by Architect	78,930	0	0			
	Total expended to date on account of Building commitments of approximately £150,000	126,277	6	10			
	Less amount written off for depreciation	5,000	0	0			
47,297					121,227	6	10
	Premises held by Feu Charter (at cost less amounts written off) —						
	Nos. 6 and 7a Drumsheugh Gardens, Edinburgh, and Contents—						
	Balance at Dec. 31, 1939 ...	4,820	0	0			
	Less amounts written off for depreciation	300	0	0			
4,820					4,520	0	0
	Investment:—						
	Shares in Subsidiary Company (at cost)—						
	598 Shares of £10 each fully paid in the Scholastic, Clerical & Med. Assn., Ltd.				6,033	10	0
6,085							
	Sinking Fund Insurance Policies:—						
	Balance at Dec. 31, 1939 ..	23,286	12	6			
	Add Premiums paid during 1940	2,433	6	8			
23,287	(Charged as part security for Loans as per contra) ...				25,719	19	2
	Library:—						
	Balance at December 31, 1939	2,037	2	8			
	Add Purchase and Binding of Books during 1940 less sale of second-hand books	284	11	1			
		2,321	13	9			
	Less amount written off for depreciation	500	0	0			
2,037					1,821	13	9
	Furniture and Office Equipment:—						
	Balance at December 31, 1939	5,889	0	9			
	Add Purchases during 1940 ...	167	18	11			
		6,056	19	8			
	Less amount written off for depreciation at 15%	903	11	0			
5,889					5,143	3	8
	Stocks:—						
	Journal Paper	5,398	0	10			
	Reprint Paper	9	4	6			
	Sundry Publications ...	69	1	8			
	Journal Wrappers	87	2	0			
2,362					5,563	9	0
	Sundry Debtors for:—						
	Advertisements	9,264	9	5			
	Less Reserve for Bad Debts and Discounts	2,500	0	0			
		6,764	9	5			
	Publishers	1,285	3	9			
	Rates paid in advance ...	974	19	5			
	Rents, etc.	3,325	14	5			
	Subscriptions in arrear ...	5,869	19	1			
	Protection of Practice Bureau Stationery	91	4	11			
15,425					18,310	13	0
	Cash in Hand:—						
	Head Office	12	9	5			
	Scottish Office	154	11	0			
	Postages and Petty Cash ...	6	1	3			
343					173	2	1
					£445,611	4	8

Note.—The accounts of the Scholastic, Clerical and Medical Association are separately kept and audited. The dividends received have been brought into account under Interest on Investments, Deposits, etc.; the remainder of the profits of that Company have been carried forward in its own accounts.

Income and Expenditure Account for the Year ending December 31, 1940

EXPENDITURE

		1939 £ s. d.	1940 £ s. d.
Journal Account ...	Abstract A	16,263 13 11	4,084 0 9
Central Meetings Expenses	" B	8,106 4 5	2,660 12 7
Capitation Grants and Direct Expenditure on Local Organization	" C	14,727 3 2	14,404 15 9
Library Expenses ...	" D	1,702 8 6	1,832 2 8
Association General Expenses	" E	8,084 2 3	4,890 15 2
Central Staff Expenses	" F	20,679 4 8	20,976 19 9
Premises Account ...	" G	14,457 3 8	16,636 3 6
Printings, Stationery and Postage Expenses	" H	3,124 3 6	2,240 5 9
Special Journals Account	" I	3 18 5	1 11 2
Subscriptions written off for Deaths and Arrears		5,071 11 11	6,133 16 8
Bad Debts and Allowances written off		154 8 3	269 2 5
Architects' Fees and Clerk of Works' Salary		5,734 12 10	1,647 7 9
Provision for War Risks Insurance		—	6,000 0 0
		£98,108 15 6	£81,777 13 11
Less Grant from Ministry of Health towards Cost of Central Medical War Committee (*towards an estimated cost of* £17,000)			7,000 0 0
			£74,777 13 11

	£ s. d.	£ s. d.		
Depreciation written off: Leasehold premises, Tavistock Sq., W.C.1 ...	3,000 0 0	3,000 0 0		
Extension of Premises, Tavistock Square, W.C.1 ...	—	5,000 0 0		
Leasehold Premises, Scottish House, Edinburgh ...	300 0 0	300 0 0		
Library	500 0 0	500 0 0		
Furniture and Fittings	835 12 8	908 11 0		
	4,635 12 8	9,708 11 0		
Less Proportion of Cost Chargeable to Journal and transferred to Abstract A	300 0 0	300 0 0		
		4,335 12 8		9,408 11 0
Reserve Funds:—				
Sinking Fund for the Redemption of Leasehold Premises ...		2,433 6 8		2,433 6 8
Reserve for Dilapidations and Redecorations		2,000 0 0		3,000 0 0
General Contingency Reserve ...		—		15,000 0 0
Reserve for Loss on Exchange on Dominion Currencies ...		1,500 0 0		1,500 0 0
Balance Transferred to Balance Sheet		898 15 11		807 3 3
		£109,276 10 9		£106,926 14 10

INCOME

	1939 £ s. d.	1940 £ s. d.
Subscriptions for year	93,685 0 4	94,207 11 0
Subscriptions for previous year ...	2,759 12 8	2,810 8 4
Subscriptions for former years previously written off	550 4 7	185 8 1
Rents Received and Accrued ...	9,005 0 0	8,986 15 0
Interest on Investments, Deposits, etc.	3,276 13 2	715 19 1
Sundries	—	18 13 1
	£109,276 10 9	£106,926 14 10

AUDITORS' REPORT TO MEMBERS OF THE ASSOCIATION

Having examined the Balance Sheet, dated December 31, 1940, and Accounts with the Books and Vouchers of the Association, except as regards the Scottish Committee Accounts, which have been audited by Messrs. Kennedy Smellie and Co., and having received all the information and explanations we have required, we report that the Balance Sheet is, in our opinion, properly drawn up so as to exhibit a true and correct view of the state of the affairs of the Association according to the best of our information and the explanations given to us and as shown by the Books of the Association.

We have inspected the Lease of the New Building, the proposals for Building Leases on sites of 3, 4, 5, 6, and 7, Upper Woburn Place, and 13, 14, 15, 16, and 17, Tavistock Square, and 58, Burton Street, and the Disposition in favour of the Association of the premises 6 and 7, Drumsheugh Gardens, Edinburgh, and have verified the investments of the Association on General Account, on account of the Trust Funds and of the Office Staff Superannuation Fund.

We further report that we have examined the Accounts, with the Books and Vouchers, of the Medical Funds for whom the Association receives remittances, and found them correct.

JOHN W. BONE, *Treasurer.* H. S. SOUTTAR, *Chairman of Council.*

G. C. ANDERSON, *Secretary.*

FREE CHOICE OF DOCTOR

BY

S. F. MARWOOD, M.D., M.R.C.P.

Much has been written of late on the shape of things to come so far as medical practice is concerned. If a State Medical Service is contemplated, and, so far as I am concerned, it cannot come too soon provided the stultifying influence of traditional civil service methods is avoided, a multitude of problems have to be tackled before conception is translated into practice. That these problems can be solved I have no doubt, but in this brief article I am concerned with one that appears at first sight to be not the least of them—namely, free choice of doctor. In considering the views of different writers I am struck not so much by the frequency with which the need for such freedom is stressed as by the lack of any explanation as to how it may operate ; indeed, even its definition is avoided.

Need for Restricted Choice

We hear much these days of democratic principles embodying the rights of individuals to freedom of existence in various directions, but little stress is laid on the equally important principle that freedom is a relative term and may exist only in so far as it does not conflict with the welfare of the community as a whole. What is this free choice of doctor that is held to be almost sacrosanct? Strictly speaking, it presumes the right of the individual to call upon the services of any doctor at any time. Manifestly such a degree of freedom has never existed hitherto. In purely private practice a doctor is quite a free agent, while in all forms of contract practice, notably in national health insurance practice, there are imposed obvious limitations into which I need not go. It has to be admitted that free choice has always to some extent been restricted, and I suggest that its consideration is largely a bogy and should not, indeed must not, be permitted to hinder the full logical development of a State Medical Service, and that further restriction must be imposed for the greater good of the greater number.

The relation between doctor and patient is one of unusual intimacy, and I do not for one moment decry the factor of faith in the physician whom Osler, in his own inimitable style, described as the modern counterpart of the ancient shrine. I believe it is possible, however, in large measure to substitute faith in the profession as a whole for that in the individual doctor. A parallel exists in the affection for a particular hospital so often met with in that considerable class of patients who attend out-patient departments. If these people are able to develop faith in a large institution without special reference to individual members of its staff, it is merely a step further to a more comprehensive bestowal of confidence ; and should the objection be raised that hospital patients belong in the main to the less enlightened sections of the community, I would reply that, in my experience, the so-called better classes are just as susceptible to suggestion in medical matters as their less fortunate brethren. I do not belittle the value of a properly sympathetic attitude on the part of the doctor towards his patients' problems ; such an attitude should be encouraged and should obtain under all conditions of medical practice. Further, it would be idle to deny that some have better developed or more inherent in them than others, the faculty of creating confidence, but surely this difficulty is largely a matter of education, or rather the lack of it ; and I firmly

believe that, with proper education alike of doctor and public, the bogy may be laid.

Educating Doctor and Public for the Change

To deal in the first place with the doctor, I would suggest more careful instruction in our medical schools on the art of what, for want of a better term, may be called "handling" people. Students, whether unqualified or those recently qualified and engaged in house appointments, are, for the most part, young and impressionable and are readily influenced, and their approach to patients is likely to be determined by imitation of their teachers. It is no longer fashionable to speak of the bedside manner: the term has become almost one of derision as a result, doubtlessly, of the humbug with which it has so often been associated, but there is, nevertheless, more in doctoring than mere academic ability, as many a brilliant student has discovered to his cost. No one will suggest that a humane manner alone makes for a successful doctor in the best sense of the phrase, but what can possibly be said in favour of its absence? Patients, in the main, are no longer to be gulled by practitioners whose only stock-in-trade is a bedside manner, and the fact is that the good doctor is one who combines reasonably both manner and ability.

It happens at times that a general practitioner, seeking a bed for a case he believes to be urgent, telephones a hospital and is greeted by a member of the junior staff in accents that are far from courteous: the catechism that follows is often curt and the comments supercilious. Such an attitude is by no means invariable but is much too common, and it is, I fancy, encountered more often at the large teaching hospitals. It probably does no more than cause passing irritation to the practitioner, but it certainly does not suggest a good preparation for the wider life that lies before the young doctor outside hospital. If he can behave thus to a professional senior it is evident that a considerable change has to be effected in his manner before he becomes acceptable to patients, and such a change often takes time even when the need for making a living introduces the factor of urgency. In a salaried service such a factor is inconsiderable, and herein lies one danger if the public are to be deprived of most of their freedom of choice. It *is unnecessary to enter into details*, but that members of the senior staffs of our hospitals and particularly of our large teaching hospitals can, by example and instruction, do much to minimize this danger is obvious.

As for the general public, it should not be difficult to demonstrate to them that insistence on the preservation of the principle of free choice must militate against the effective working of a State Medical Service with its manifold advantages of *early diagnosis and prompt* treatment divorced from financial anxiety. It should be put to them that, while it is right and proper that the resources of the medical profession are available at all times in case of need, it is selfish to demand similar service from the individual doctor. Under present condition the vast majority of doctors are, except for all-too-brief interludes, liable for service during every minute of their existence. Can such an existence be justified by any reasonably minded person? Further, can the continuation of such a system, necessitated by the preservation of present ideas of freedom of choice, seriously be contemplated in a State Medical Service? No thoughtful person will doubt the answer to these questions.

It would seem to me that, with the advent of a State service, freedom of choice must be limited to consultations at appropriate centres at appropriate hours, and that, unless the present uneconomic system is perpetuated whereby several doctors are visiting the same small district or even the same street on any one day, it must be dispensed with in patients' homes except possibly in those cases where a second opinion is needed. There will be difficulties and objections of various kinds in the early days, but is this not the fate of every progressive innovation affecting human welfare? For an example we need cast our minds back no further than the early days of the National Health Insurance Act, yet I warrant there be few who will dispute the tremendous social value of the Act.

An "Infinitely Superior" Service

Dr. S. T. Pybus, in a recent article, outlines a scheme for a State Medical Service. As he admits, it is revolutionary, and I think rightly so. In the main his suggestions appear to me to be sound, and I like among other things his provision for postgraduate facilities, whereby practitioners would be able to maintain and enlarge their medical education, and thus be better fitted to place early at the disposal of their patients those varied methods of investigation which even to-day are so often used too late. I would go further and make such refresher courses compulsory, with an appropriate test at their conclusion and some sort of penalty for slackers. It would not be possible then to hear the occasional comment, "I have never read a medical book since the day I qualified" and, what is more important, further incentive would be given the public to accept a State service.

We must cease worrying about freedom of choice and give something of far greater value in the form of a service infinitely superior to that which has existed hitherto. We general practitioners have often been up in arms against the inevitable inroads of the public health services into what we have regarded as our preserves, although I suspect it was more often the manner of the encroachment than the encroachment itself which evoked our resentment; yet who will deny that these services, not so much by virtue of the superior ability of the medical staff as by organization and team work, have effected a greatly improved standard of health in the community. So will it be with a State service.

To summarize, I believe that even to-day the great majority of patients, however ardently they may in the first place desire a particular doctor, will not fail to be completely satisfied by any doctor who deals faithfully and conscientiously by them. Sick patients, however, under any system will always resent the doctor who deals brusquely with them, no matter how efficient he may otherwise be. Given proper education of doctor and public, I believe that as the years of a State Medical Service pass by, and patients come increasingly to rely on a sympathetic handling of their illnesses by doctors whose efficiency is guaranteed by the State, less and still less will be heard of the question of free choice of doctor.

MEDICAL REPORTS ON A.T.C. ENTRANTS

The Air Ministry has issued for use by Honorary Medical Officers of Squadrons of the Air Training Corps for the examination of entrants, an official form of medical report, together with explanatory notes. The candidate is asked to answer six questions regarding his medical history, and the Medical Officer is asked to report on the physical condition on the following form:

PHYSICAL EXAMINATION

A. HEART. Size.
Sounds.
Rhythm.

B. LUNGS.

C. ABDOMEN

D. VISION: R. 6' Colour Vision.
L. 6' Normal or otherwise.

For Air Crew vision not to be worse than 6/18 in either eye without glasses. For Ground duties vision not to be worse than 6/60 correctible to not worse than 6/12 in either eye.

GROUND DUTIES.—While for certain trades a high standard of visual acuity is required the lowest visual standard at present accepted for men entering the Royal Air Force is as follows: If a candidate has lost the vision of one eye, completely or partially, he can still be accepted in exceptional circumstances, if the vision of the other eye, with or without glasses, is not less than 6/12.

E. EARS. Hearing. For Air Crew duties candidate must be able to hear a forced whisper at 20 feet distance with either ear tested separately. For Ground duties candidate must be able to hear a normal speaking voice from 10 feet away.

F. GENERAL EXAMINATION: Any Physical abnormalities.

REMARKS of Hon. Medical Officer.

Date ..... Hon. Medical Officer of No. ... Squadron A.T.C.

NOTE.—(1) Considerable help can be given to the Hon. Medical Officer by filling in names, date of birth, etc., by Squadron Officer.
(2) All Medical forms to be returned to Officer Commanding in plain envelope to Squadron concerned and not in Squadron name.

CONFIDENTIAL. A.T.C. Form M.1.

GENERAL MEDICAL EXAMINATION OF A.T.C. CADET

(Not for entry into R.A.F.)

Surname .....
(in BLOCK letters)
Christian Names ..... Date of Birth .....
Have you any history of:—
1. Sleepwalking or Bedwetting .....
Fits or convulsions of any kind .....
2. Pneumonia or Pleurisy .....
Asthma and Hay-fever .....
3. Rheumatic Fever, Diphtheria or Scarlet Fever .....
Weak or Strained Heart .....
4. Eye trouble or Inflammation of Eyelids .....
5. Earache, Discharge from the Ear, Ear, Nose or Throat trouble .....
6. Operations .....

The explanatory notes are as follows:

AIR TRAINING CORPS

NOTES FOR HONORARY MEDICAL OFFICERS

(To be read in conjunction with A.T.C. Form M.1.)

The following is an outline of the standards of physical fitness required:—

1 (a) The boy must be free from any disease or physical defect calculated to render him unfit for his duties in the Royal Air Force.

(b) He must be fit or likely to be fit when old enough for entry to serve at home and abroad under active service conditions.

(c) He must not suffer from any of the following defects: (i) Fits, chronic bronchitis, or winter cough; (ii) a weak constitution, such as evidence of tuberculous disease; (iii) contraction or deformity of chest, joints, or spine; (iv) disease of the heart or lungs; (v) severe varicose veins or haemorrhoids; (vi) discharge from or disease of either ear; (vii) enlarged lymphatic glands; (viii) kidney disease; (ix) hyperthyroidism.

(d) A personal history of acute rheumatic fever, more than one attack of unconsciousness, bed-wetting, or asthma will require careful consideration at the time of the medical examination.

2. **Standards of Vision.**

(a) *Air Crews:* (i) Visual acuity below 6/18 in either eye debars consideration for air crew duties; (ii) defective colour vision debars consideration for air crew duties.

(b) *Ground Duties:* While for certain trades a high standard of visual acuity is required, the lowest visual standard at present accepted for men entering the Royal Air Force is as follows:—(i) If a candidate has lost the vision of one eye, completely or partially, he can still be accepted in exceptional circumstances, if the vision of the other eye, with or without glasses, is not less than 6/12. Myopia or more than minus 7 in any meridian is, however, a bar to acceptance. (ii) Defective colour vision is not a bar to entry, except in certain trades.

3. **Standards of Hearing.**

(a) For air crew duties normal hearing is required—that is, forced whisper must be heard at 20 feet with either ear, the other being blocked. (b) For ground duties the standard is not so high, but the man must be capable of easily hearing a spoken voice at a distance of 10 feet. For certain trades, however, normal hearing is required.

4. The record of the medical examination is made on A.T.C. Form M.1, and in the "remarks" space the examining medical officer should state whether or not he considers that the boy is likely to be fit for (a) air crew duties and/or (b) ground duties.

Correspondence

Certificates for Additional Milk

SIR,—I have just received a supply of forms, issued by the Ministry of Food, to be used for "additional supplies of milk to persons suffering from certain diseases," and if anything more futile was ever devised even by a Government Department it has not been my fortune to see it. The arbitrary list of "the only diseases in respect of which supplies of milk may be recommended" has evidently been compiled from a dictionary of medical terms, without reference to a doctor or even to a housewife. Here it is, with comments.

1. *Active tuberculosis of all types and of all organized tissues.* I am at a loss to understand what subtle type of tuberculosis eludes the comprehensive "all types" and requires the elaboration "of all organized tissues." This also seems to beg the question: "Which tissues of the body are not organized?"

2. *Silicosis.* Why pick on silicosis? Admitting that it predisposes to tuberculosis, does not bronchitis with emphysema demand precisely similar treatment?

3. *Conditions in which the patient is unable to swallow solid food by reason of an affection of the mouth, throat, or gullet.* . . This specification appears to exclude thoracic aneurysm, mediastinal growth, or thyroid cancer. And the rules for the disposal of the form mean that the householder (probably the patient) and the dairyman must be told of a cancer of the oesophagus, while we labour to keep the patient cheerful.

4. *Gastric, duodenal, or anastomotic ulcers.* The bureaucrat could not resist the appeal of the sonorous when "peptic ulcer" would suffice. And what about all the cases of gastritis, many of them in valuable workers, which may produce ulcers or in which the patients may be otherwise incapacitated unless they can be kept on a diet rich in milk?

5. *Illnesses characterized by high and prolonged f* "high" not enough, and what is the duration o longed"?

6. *Post-operative conditions after major operatio* would appear to allow milk for an amputation neuro not for cardiac failure following dental extraction.

It is reasonable to assert that 90% of invalid diet more than a bare minimum of milk. It is not, perhaps in Whitehall that almost all cereals require milk eithe cooking or in the eating, and to suggest that less ailments can do without is absurd. A working cou often make do with half a pint a day for their tea; she nurse him through gastric "flu" out of that?

If the certificate of a medical man that extra milk is cannot be accepted as adequate proof of the *bona fide* case, then the list of diseases must be extended. giving prolonged thought to the matter, I should say want extra milk available for arthritis, cardiac failure, of all kinds, goitre, gout, hypertension, jaundice, nephri doubt you can add another half-dozen yourself.—I am,

Grimsby, May 3. E. J. THOR

State Medical Service

SIR,—Dr. Alan Marsh in his interesting letter (*Supp* April 19, p. 47) states: "A fixed salary destroys in and ambition." He does not suggest why; he just st dogmatically and definitely, *deus-ex-machina*-like: a salary destroys initiative and ambition. May I, how fixed salary man, ask him if his declaration, his edict, to all those enjoying security of income? These, as schoolboy knows, include the Archbishop of Canterbu all his bishops; the Prime Minister and each and every m of his Cabinet; every admiral in the Navy, every gen the Army, and every marshal in the R.A.F., and al officers and men; it includes 99% of the officers of all business concerns and of the railways, the B.B.C., e includes the headmasters and staff of the public, privat State-aided schools; the Civil Service; the judges; many trates who dispense justice; and all the staffs of municip It does not include such varied ranks of society as profe men in private practice, small shopkeepers, hawkers, milli motor magnates, and, I believe, a number of the clergy.

Medical officers of health have from time immemorial accused of encroaching on the preserves of the general titioners, and stealing their thunder here, their lightning This constant erosion is presumably in Dr. Marsh's view their desire constantly to secure renewed stocks of init and ambition in order to have more to destroy.—I am, et

HUGH PAUL, M.D., D.P.H.,
May 7. Medical Officer of Health, Smethwi

Postgraduate News

The Fellowship of Medicine announces the following cour preparation for the next M.R.C.P. examination: Chest disea Brompton Hospital, Mondays and Thursdays, 5 p.m., May June 19; nervous diseases at West End Hospital for N Diseases, Tuesdays and Fridays, 3.30 p.m., May 27 to June

APPOINTMENTS

EXAMINING FACTORY SURGEONS.—J. B. Fleming, M.D., for the Ma District (Fifeshire); G. L. Gately, M.B., Ch.B., for the Stoney S District (Leicestershire); A. G. J. Harris, M.B., B.Ch., for the Shr District (Dorsetshire); J. Hutton, M.B., Ch.B., for the Leominster D (Herefordshire); L. H. M. Milligan, M.D., D.P.H., for the Longdendal Glossop District (Derbyshire and Cheshire)

HARTE, E. H., M.B., B.Ch., Deputy Medical Officer of Health and I School Medical Officer, Borough of Harrogate.

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount sh forwarded with the notice, authenticated with the name and address of the sender, and reach the Advertisement Manager not later than the first post Tuesday morning to nsertion in the current issue.

DEATH

FORDE.—In April, 1941, through enemy action, in London, Dr. Wm. G Forde, late of Bombay. (Irish, Indian and Australian papers, please

To induce sleep and calm nervous excitement under difficult conditions



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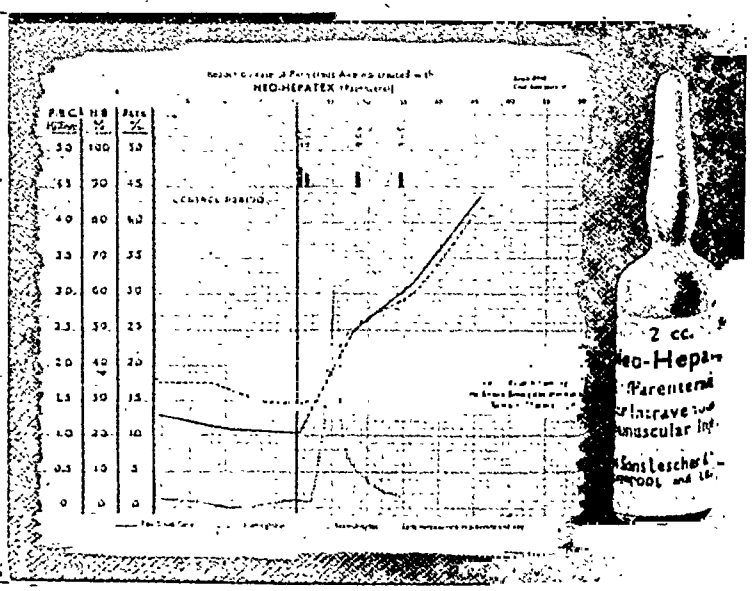
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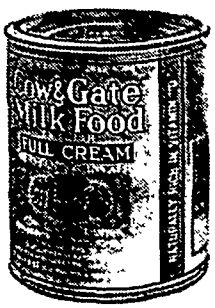
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the fluid was only faintly opalescent and was under normal pressure, stupor, confusion, and irritability persisted. At 11 a.m. on the 17th she began taking sulphapyridine by mouth—15 grains (two tablets) six-hourly. As it was suspected that the drug might be responsible for the failure of her mental symptoms to show improvement, corresponding with the almost normal appearance of the cerebrospinal fluid, the dosage was reduced at 11 p.m. to 7½ grains six-hourly, and the drug was omitted altogether twenty-four hours later.

On the morning of the 18th she was beginning to improve and was able to answer simple questions. On the 19th she was more alert and felt much better; neck rigidity was less marked. By the 20th all signs of meningeal irritation had disappeared; she was mentally normal, and spasm of the hamstrings, neck rigidity, and headache were entirely absent. The temperature, however, rose slightly above normal, and one tablet of sulphapyridine was given six-hourly during the next twenty-four hours. On the 21st neck rigidity and a positive Kernig's sign were again noticed, and as she began vomiting the dose was reduced to one tablet eight-hourly, the drug being discontinued on the 22nd. Next day there were no abnormal symptoms or physical signs, and she made a rapid and uninterrupted recovery.

Case IV

This patient, a girl aged 10, was taken ill with headache and vomiting on April 14, 1940. She became delirious on the 16th and was admitted to hospital in the afternoon in an unconscious and extremely restless condition. Rigidity of the neck and a well-marked positive Kernig's sign were found, but no petechiae could be seen. The cerebrospinal fluid was under greatly increased pressure, was turbid to the naked eye, and contained a large number of pus cells and meningococci.

Sodium sulphapyridine 3 c.cm. was given intravenously on admission and intramuscular injections of 3 c.cm. were continued four-hourly during the next sixteen hours. The following morning a lumbar puncture showed the cerebrospinal fluid to be almost clear and under normal pressure. She was much better, and was willing to take tablets by mouth. Two tablets (15 grains) four-hourly were substituted for the injections. On the 18th she again became delirious, with pronounced neck rigidity. As the spinal fluid was quite clear and was under normal pressure the administration of sulphapyridine was discontinued. On the 19th there was a noticeable improvement in her general condition, and by the 20th she had lost all her symptoms and physical signs. Her convalescence was uneventful.

Case V

A girl aged 11 was admitted to hospital on January 24, 1941, twenty-four hours after the onset of the first symptoms—headache and vomiting. She was complaining of intense headache, but answered questions promptly and intelligently, and there was no restlessness. She had a good deal of head retraction, and the lower limbs were held flexed at the hips and knees. No petechial haemorrhages were to be seen. Lumbar puncture showed purulent fluid under increased pressure; from this meningococci were grown.

The girl tolerated sulphapyridine well by mouth, and was given 22½ grains on admission and 15 grains four-hourly for the next forty-eight hours. On the 25th head retraction and spasm of the erector muscles of the spine became more intense; but there was no headache and she remained quiet and rational. During the evening of the 25th she became restless. But next morning she was confused and quite unmanageable; neck rigidity was still well marked. The cerebrospinal fluid was under normal pressure, and was only faintly opalescent. The dose of sulphapyridine was reduced to 7½ grains four-hourly, but, the restlessness not improving, the drug was omitted at 5.30 p.m.

On the morning of the 27th the patient was quite rational, and rigidity of the neck and spasm of the erector spinae were much less noticeable. She continued to improve rapidly, and had lost all her abnormal signs by the morning of the 29th. She made an uninterrupted recovery.

Discussion

The most striking feature of the five cases reported above is the persistence of their cerebral symptoms in spite of intensive sulphapyridine treatment. Although this type of clinical history was not at all unusual before sulphapyridine therapy of meningococcal meningitis was introduced, the average patient responds to the drug so rapidly and so well that some explanation must be found to account for those cases which are exceptions to this rule.

The first and most obvious answer would be to call these cases drug-resistant and to suggest that their symptoms were due to persistence of the infection. A closer study of the case histories shows that this view is untenable. The appearance of the cerebrospinal fluid, which in this disease is a very reliable guide in assessing the response to treatment, showed gradual return to normal in every case. The patients' symptoms, however, either became progressively more severe (Cases I and II) or returned after a transient improvement (Case IV). The contrast is even more marked in Case V, whose first symptoms of cerebral irritation appeared on the third day of treatment, although the cerebrospinal fluid was by then under normal pressure and was almost clear. The strongest point against the infective origin of the cerebral symptoms is the marked improvement which occurs so rapidly after withdrawal of the drug.

These facts not only contradict the theory of a drug-resistant infection but seem to indicate that the persistence and increasing severity of the mental symptoms were due to the toxic effect of sulphapyridine. If this view is accepted it is easy to see why improvement follows so quickly when the drug is omitted; also, the reason for the discrepancy between the clinical picture and the appearance of the spinal fluid becomes obvious. It now remains to be seen how this type of toxic reaction can be recognized.

It is often extremely difficult to decide whether cerebral symptoms persisting after the second or third day of treatment are due to the disease or to the drug. All the mental symptoms which our cases have shown—irritability, restlessness, confusion, and stupor—are part of the clinical picture in acute meningitis, and by themselves may easily be ascribed to the infection. The differential diagnosis is least difficult in patients who are mentally normal when first seen, and whose cerebral symptoms appear on the second or third day of treatment (Case V). The origin of the symptoms in such cases is obvious. Others show a clearly marked period of remission, after which the mental symptoms return in spite of continued intensive treatment. In some patients, again, the transition between the two sets of symptoms is imperceptible, and the diagnosis cannot be made on purely clinical grounds.

The temperature chart affords no assistance, being a most unreliable guide even in uncomplicated meningitis. The degree and type of pyrexia vary from case to case. Some of our patients have been apyrexial throughout their stay in hospital. Similarly, cerebral symptoms may occur in association with a raised as well as a normal temperature. Clinical signs, such as head retraction and spasm of the hamstrings, are also misleading. These sometimes persist for days into convalescence, and their presence in association with cerebral symptoms must not be taken as a certain indication that the infection is still active.

If it is suspected that the persistence of the symptoms is due to the toxic effect of the drug a lumbar puncture should be made without delay. If the fluid is clear and under normal pressure, administration of the drug must be discontinued immediately. Where this is done in time the prognosis is favourable and no additional therapeutic measures are required. On the other hand, if administration of sulphapyridine is continued in these circumstances the outcome of the condition is likely to be fatal. The assistance afforded by lumbar puncture in the diagnosis of these toxic reactions raises the question whether this procedure should be carried out daily in all cases. We believe that this is unnecessary as a therapeutic measure

in patients who respond well to drug treatment and in the absence of symptoms of increased intracranial tension. On the other hand, a sample of the cerebrospinal fluid should be obtained from every patient whose cerebral symptoms fail to clear up within two or three days after the beginning of treatment and in all cases in which these symptoms set in during the course of treatment or recur after a transient improvement.

It is unlikely that any constant relation exists between the concentration of sulphapyridine in the blood or cerebrospinal fluid and the appearance of this type of toxic reaction. Although the amount of sulphapyridine given in the first four cases is much higher than the dose which would be used to-day, a number of patients have taken similar large doses without ill effect. On the other hand, the dosage in Case V would not seem to be excessively high, and yet the patient developed toxic manifestations. It is probable that individual sensitivity to the drug plays an important part in the causation of these toxic symptoms.

Conclusion

The number of cases treated at this hospital during the past fifteen months is too small to allow us to draw any definite conclusions as to the incidence of cerebral symptoms attributable to sulphapyridine treatment. It seems, however, that they are not at all uncommon. It is safe to say that the incidence of this type of toxic reaction is greater among children than among adults, and those receiving the drug by the parenteral route are more liable to it than are those taking it by mouth.

Summary

Five cases of meningococcal meningitis showing persistent cerebral symptoms are reported.

It is suggested that these symptoms were due to the toxic effect of sulphapyridine.

We have to thank Dr. T. Peirson, medical officer of health to the city of Plymouth, for permission to publish the case notes.

LOSS OF VISION FOLLOWING HAEMORRHAGE

BY

H. L. TIDY, M.D., F.R.C.P.

Physician to St. Thomas's Hospital; Colonel, Consulting Physician to the Army at Home

Loss of vision following haemorrhage attracted considerable attention in the earlier decades of the nineteenth century, when blood-letting provided a cause which fortunately no longer operates. It is a rare complication, and surprisingly so after haemorrhage due to accident or trauma, such as occurs in warfare.

The mode of development of the disturbance of vision falls into two groups. In the first group the disturbance closely or immediately follows the haemorrhage. Thus on recovering from syncope due to loss of blood the individual finds that the vision is entirely lost or is impaired in varying degrees. With the more severe grades, especially complete blindness, there is often considerable emotional disturbance, and for this reason the condition has been held to be functional. But more probably it is due to sudden anaemia of the cortical visual centres or of the retina, analogous, as Rolleston points out, to the impairment of hearing which may occur. There are no changes in the fundus. The disturbance is transient, recovery beginning immediately and being as a rule complete and permanent. This group is not further referred to.

The second group is more important, but is undoubtedly rare. In this type there is usually an interval after the haemorrhage before vision is affected. The impairment may then advance for several days before recovery begins, and some degree is often permanent. Oedema of the disk is nearly always recognizable, though the swelling may be only slight, and oedema of the retina has been described in recent cases. Optic atrophy develops in permanent cases.

The Literature

Harbridge (1924) could find only 18 cases recorded in the literature between 1912 and 1924, a period which included the last war. There has been much discussion as to what is the cause or lesion; it is generally agreed that a combination of several factors is necessary, and possibly these are not identical in all cases. It is probable that blindness never follows haemorrhage in an individual who is in normal health. Haemorrhage alone is not a sufficient factor, since permanent or prolonged disturbance of vision does not follow a single haemorrhage, however profuse, and there is no recorded instance of permanent loss of vision in the bleeding of haemophilia.

Anaemia likewise is not a sufficient cause by itself. In the Victorian and pre-war era two great anaemic diseases were prevalent—pernicious anaemia and chlorosis. For the purposes of a discussion on the ophthalmological complications of diseases of the blood, Panton (1935) investigated a series of 117 consecutive cases of pernicious anaemia admitted to the London Hospital between 1911 and 1920. In this series there were only two cases in which there was disturbance of vision. In one case the patient complained of dimness of vision, and the ophthalmic surgeon's note reads, "Oedema of both disks and retinae: about 2D of swelling in right disk, less in left disk. Many linear haemorrhages in fundi." In the other case the patient complained of rapid loss of vision, ending in almost complete blindness associated with complete optic atrophy. She had, in addition, fairly advanced cord changes. This is the only case recorded in the literature of severe loss of vision occurring in pernicious anaemia. In chlorosis it may be accepted that papilloedema is occasionally found, and there are many discussions in the older literature as to its significance. Nevertheless it is clearly not of a high degree, and is usually recorded as blurring or haziness of the edge of the disk. It is noteworthy that Clifford Allbutt (Allbutt and Rolleston, 1909), who must have had an enormous experience, stated that he had never seen a case of permanent blindness developing in chlorosis. Before the days of modern treatment the oozing from haemorrhoids sometimes reduced the subject to a state of extreme anaemia, and a profuse haemorrhage might then occur. Nevertheless there is no instance in the literature of disturbance of vision in this condition.

There is little evidence on which to assess the influence of oedema. Certainly gross oedema, apart from a nephritic origin, has no part in producing permanent loss of vision, but most of the recent ophthalmological examinations, when made shortly after the onset, record oedema of the retina and some swelling of the disk, though the latter may be slight. Such localized oedema might well occur after a severe haemorrhage or after a more moderate haemorrhage in an otherwise debilitated subject. It is not impossible that shock may be an important factor.

Site and Circumstances of Haemorrhage

The site of the haemorrhage is of interest. Fries (quoted by Barr, 1934) gives the statistics of 106 cases recorded up to 1876 as follows: Gastric ulcer, 36%; uterus, 25%; epistaxis, 7%; blood-letting, 25%; accidental wounds, 5%. In those days the condition especially attracted attention as a sequel of blood-letting, and Gowers refers to this at some length in his *Medical Ophthalmology*. He states that loss of vision occurred only after repeated bleedings

and never after a single blood-letting, however large; and he points out that the subjects were all in bad health previously. He expresses the opinion that a single haemorrhage, however profuse, never results in permanent loss of vision in an otherwise healthy subject. This is borne out by the extraordinary rarity of this sequel in accidental haemorrhage. There appear to be only three cases recorded in the last war—two by Pincus (1918) and one by Terrien (1921)—and there is a striking similarity in the histories. In all three cases a lower extremity was crushed, gas gangrene supervened, and amputation was performed several days after the wound. It is now known that serious metabolic disturbances develop in such circumstances. No doubt there are other unpublished cases.

Harbridge gives the site of bleeding in the 18 cases published between 1912 and 1924 as follows: peptic ulcer, 6; uterus, 6; nose, 3; and 3 of accidental haemorrhage, these last being the cases of Pincus and Terrien. The comparative frequency of epistaxis is interesting. Harbridge records a personal case in which epistaxis had been recurrent and severe since childhood, and the history suggests a blood-deficiency disease, such as thrombocytopenia and hypoprothrombinaemia.

The circumstances of the haemorrhage vary considerably. Most commonly there is a history of repeated haemorrhage, the bleeding which preceded the disturbance of vision usually but not always being severe. In other cases there has been prolonged haemorrhage—for example, after childbirth. Rarely there has been only a single haemorrhage, but the subject has been in a debilitated or toxic state. In Harbridge's case associated with epistaxis, impairment of vision has occurred on three occasions separated by several years. No age is immune: most of the subjects have been between 40 and 50, but cases are recorded in childhood and in old age. There is little difference in its incidence in the two sexes. A striking feature is the interval which commonly elapses between the haemorrhage and the recognition by the patient that the vision is impaired. The initial complaint is usually made between the third and eighth days. The longest recorded intervals are eighteen and twenty days. The impairment, however, may be recognized shortly after the haemorrhage, as on recovery from syncope; and it is said that this was comparatively common in blood-letting cases but, as Gowers states, not after a single bleeding. It is possible that in these instances the initial blindness belongs to the first group, and the more permanent type follows. The diminution of vision when first noticed may vary from blurring to complete blindness. In the partial grades it tends to increase for three or four days, and then improvement may set in. Recovery may be rapid at first and then continue slowly for weeks or months. Several observers agree that the upper part of the field of vision is less affected and recovers more completely than the lower part. If the loss of vision becomes complete it usually remains so permanently, but Lister (1929) mentions a case in which recovery was perfect three months later. The disturbance of vision is generally bilateral: but it may be unilateral, or the degree of impairment may be different in the two eyes.

As to the final result, in 33% of the cases blindness is complete and permanent in both eyes, and in 50% there is no improvement from the maximum loss. About 10% recover good or complete vision. In the remainder there are varying degrees of improvement in one or both eyes.

Findings in the Visual Field

Visual field findings show great variations. In Bamford and Barber's (1940) case there was progressive concentric contraction of the fields. In Barr's case there were central scotomata with enlargement of the blind spots and only slight contraction of the colour fields. There may be sector-like defects or paracentral scotomata. Ophthalmological changes are also inconstant. When examined shortly after the onset most observers record swelling of the optic disk, which may be intense or as little as one dioptre, or only blurring of the margins. In Lister's case, referred to above, with complete blindness there were no *fundus changes*. In several cases oedema of the retina has been recorded. Goerlitz (1920) was able to make a pathological examination of the eyes from a man who died ten days after the onset of blindness following haematemesis. The principal changes were intense oedema of the disks and oedema of the retinae. Goerlitz states that the changes resemble those found in intoxication amblyopia such as is caused by methyl alcohol.

In cases of definite permanent impairment of vision, when seen several months after the onset, all observers agree as to the presence of optic atrophy, often of a high grade, with no other appreciable changes in the fundus. The optic atrophy may be either primary or secondary.

Local Oedema an Important Factor

There is no agreement as to the essential pathological lesion, but it is generally accepted that local oedema is an important factor. Degeneration and death of the ganglion cells of the retina and their nerve fibres, resulting in optic atrophy, has been suggested. In such an event if the disk had been swollen the atrophy would be secondary in type, otherwise it would be primary. Retrobulbar neuritis has also been suggested; and this could account for cases in which no change was found in the fundus in the early stages, and the final optic atrophy could be primary or secondary in type. This would agree with the observation of Goerlitz that the pathological changes resembled those produced by methyl alcohol and quinine. Unfortunately there are no pathological observations of *the nerve trunk or tracts*.

I saw the following case in consultation with Dr. J. L. Lock.

Case Record

The patient, a primipara aged 30, was confined on the evening of June 20, 1936. It was known that she had been anaemic since childhood, and two blood counts taken at an interval several years previously both showed approximately 3,500,000 red cells per c.mm. and haemoglobin 50%. She had been given occasional bottles of an iron mixture. Menstruation had been within normal limits. In spite of the anaemia she had been reasonably active.

Pregnancy was normal throughout, except that oedema of the feet and ankles of a somewhat marked degree had been observed for the last few weeks, but several examinations had not revealed any albuminuria. Confinement was uneventful, except that the loss of blood was noted to be more than normal but not sufficient to cause anxiety, and it ceased without special measures. On the following morning, June 21, she was mentally confused, unaware of her surroundings, did not realize that she had had a baby, and looked very anaemic. I saw her on the same day. The temperature was normal and the pulse about 100. There was considerable oedema of the feet. The blood pressure was 140/80. The fundi were normal. The urine contained a trace of albumin but no casts. The blood urea proved to be 32 mg. per 100 c.cm. The blood count showed 2,800,000 red cells per c.mm. and haemoglobin 36%. The white cells were approximately normal. I considered that she was suffering from anaemia of pregnancy developing on a chronic constitutional anaemia. She was given a blood transfusion and was put on liver extract and large doses of iron. Ten days later the mental condition had almost cleared and the anaemia was improving. She then complained that her vision was misty and that she could not see clearly, but little attention was given to her complaint. Three days later, for the first time, she was given a letter, and it was then discovered that she was unable to read it. On examination she was found to have bilateral central scotomata, and there was 2D of swelling of the disks

but no other fundus changes. The urine was normal and the blood count gave 3,800,000 red cells and 50% haemoglobin. Four months later the vision had recovered completely and the fundi were normal. The blood had improved to 4,500,000 red cells and 80% of haemoglobin.

It would be interesting to know if any cases have been observed in the present war.

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AN UPPER-ARM SPLINT WITH A SHOULDER YOKE AS MAIN SUPPORT

BY

J. KVITTINGEN, M.D.(Norway)

There are already a great number of different types ot splints available for the treatment of injuries of the upper arm, and the introduction of yet another device is certain to arouse criticism. The method which is here described was first employed under practical conditions when existing appliances had been found to be unsatisfactory. The main defect of all the types hitherto in use seems to be that their fundamental point of support is on the hip-bone, and in order to keep this support in position it is necessary to use a large number of tight straps; in spite of these there is a marked tendency for the splint to slip downwards and forwards.

Application of the Method

While working as a military surgeon in the Abyssinian army on the southern front I found that the existing methods of splintage were in many ways unsatisfactory. Cotton-wool padding became rapidly infested with lice and bugs, and patients complained bitterly of the discomfort and irritation. In order to overcome these difficulties I tried fixing the splint by means of a main support consisting of a shoulder yoke. This method was first tried out on a soldier with a compound fracture of the humerus. The first splint was moulded on an unwounded man of approximately the same build, and was made in plaster-of-Paris on the framework of a ladder-wire splint. In the first place a plaster-of-Paris yoke was laid across the shoulders in the manner of a sailor's collar. The ladder-wire splint was incorporated from behind the middle of the yoke, and was bent over the shoulder and downwards to a point two fingerbreadths below the clavicle. From this point the splint was bent to form a right-angle and allowed to follow edgewise the anterior aspect of the upper arm, which was thus retained in the correct position. A vertical support was attached to the underside of the splint immediately below the shoulder-joint by means of string and plaster-of-Paris. On the unwounded man the splint was retained in position by adhesive plaster. A simple extension was also incorporated. The patient was well satisfied with the splint, and the experiment proved highly successful.

The broken fragments were kept in accurate position, and no daily adjustment of the splint was needed, as had been the case with other types. The patient was able to lie down in comfort while wearing the splint, and it also proved practicable to transport patients treated in this way. On one occasion a soldier wearing a yoke splint rode from Vaarda, on the southern front, to Soddu, a town in the south-west, a journey which took twelve days. A plaster-of-Paris splint modelled on the patient is ideal for fixation of fractures of the neck of the humerus, but it may be very difficult to make when no suitable support can be found around which to fashion it. Fig. 1 shows a back

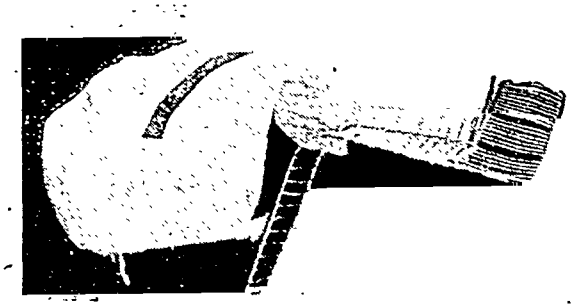


FIG. 1

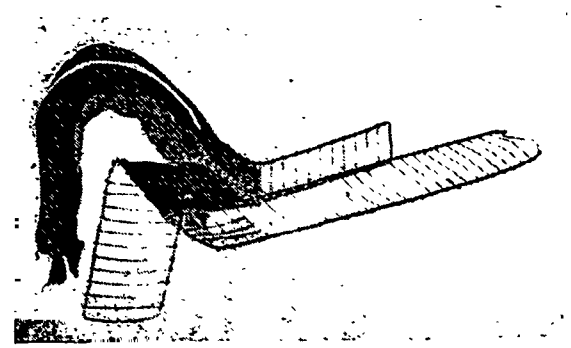


FIG. 2

view of the plaster-of-Paris splint, Fig. 2 a side view. I have also constructed an aluminium splint consisting of two main parts—a yoke and an adjustable support which by means of a ball joint is applied to a steel bow fixed with screws to the yoke. A side bracket which presses against the chest is fixed to the steel bow. An extension is fitted, and a strap keeps the splint in position on the undamaged side. The support can be used equally well on either side.

Advantages

The following points are submitted as the advantages of this improved method of splintage. (1) By means of the yoke the position of the upper arm is fixed in relation to the shoulder girdle; this should lead to complete immobilization and great stability. The yoke prevents the splint from slipping downwards or forwards. (2) The splint permits free movement of the spinal column. (3) If both arms are fractured simultaneously a support can be mounted on each side. (4) Where abduction, but not extension, is required the patient may wear ordinary clothes. Extension can also be very simply incorporated.

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THE FLOSS SILK LATTICE POSTERIOR REPAIR OPERATION FOR DIRECT INGUINAL HERNIA

BY

RODNEY MAINGOT, F.R.C.S.

Senior Surgeon to the Southend General Hospital and to the Royal Waterloo Hospital, London

This posterior reconstruction operation is not new, nor is it original in any of its essential features. It is in many respects similar to the Gallie method (Gallie and LeMesurier, 1924)—except that here silk is used instead of fascia lata and the pattern of the darn is different—and to the darn-and-staylace procedure which was first recommended and practised with such success by Sampson Handley (1918). In recent years the silk lattice repair has been sponsored by Ogilvie (1937), myself (Maingot, 1940), and others. Since 1934 it has been the method of choice at the Southend General Hospital for all cases of direct inguinal hernia, and we have also employed it for many cases of large oblique inguinal hernia in which the margins of the internal ring and the posterior wall of the inguinal canal have been unduly stretched and the muscles somewhat atrophied.

The final results of this operation when skilfully performed in the manner about to be described have proved so gratifying that they have been almost too good to be true. We have preferred floss silk to other suture material, such as chromic catgut or Pearsall's No. 4 Chinese twist silk. Floss silk is stronger than strips of fascia lata; it remains, of course, unabsorbed in the structures in which it is buried, but it produces no tissue reaction, and eventually becomes incorporated in fibrous tissue. Each strand is composed of many gossamer-like fibrils loosely bound together, and it is not a difficult matter for the fibroblasts to work their way between the fibres and to permeate the new scaffolding with strong white fibrous tissue. The floss silk which we used for our first series of cases was prepared specially for us by Messrs. Arnold and Sons. This was boiled for four hours, and a strand some twenty inches in length was then twisted around a glass rod which was immersed in a hermetically sealed glass tube containing absolute alcohol. Just before use the silk was removed from the tube, dipped into warm normal saline solution, and then thoroughly rinsed in doubly distilled water to rid it of all traces of alcohol. Since the outbreak of the war, however, we have been content merely to boil the strands of silk for some two to four hours before use and then keep them in sterile containers filled with distilled water. We have not immersed the boiled silk in paraffin, glycerin, or other chemical solution before use, as we believe that the employment of these would predispose to tissue reaction, with the outpouring of serum—a most undesirable contingency.

In the conduct of this operation we insist upon the most scrupulous asepsis, haemostasis, gentleness, and tidiness.

Technique of the Operation

The usual incision is a straight one placed parallel to the inguinal ligament and about half an inch above it, and extending from one inch lateral to the internal ring to a point overlying the centre of the external ring. This incision gives direct access to the structures of the inguinal canal, but as it cuts across the lines of stress it sometimes leaves an ugly stretched scar which may be keloid. A more transverse incision, placed in the natural crease in this region, to is be preferred. This starts an inch or so below the anterior superior iliac spine and extends inwards, crossing the inguinal ligament at the junction of the middle and inner thirds, passing to within an inch of the midline, and terminating one and a half inches above the symphysis pubis.

The incision is deepened and the superficial femoral vessels are identified, clipped, divided, and then ligatured with No. 000 plain catgut, after which the subcutaneous tissues are separated down to the shiny aponeurosis. "Tetra" cloths are affixed to the skin margins to isolate the field of operation completely. The upper skin flap is picked up with a pair of toothed dissecting forceps and dissected first upwards to expose a wide area of the aponeurosis and then in a lateral direction for two inches beyond the internal ring. The lower flap is cautiously freed in order to display the inguinal ligament and the attachment of this ligament to the pubic spine.

The external ring should be freely displayed, after which an incision one-half to one inch long is made in the aponeurosis in line with the pillars and an inch or so from the point where they diverge. This incision is lengthened laterally for two inches or so, while medially it cuts across the stretched fibres of the aponeurosis and the lacing transverse bands of the intercolumnar fascia.

The upper leaf of the aponeurosis of the external oblique muscle is clipped with artery forceps and retracted upwards and inwards in order to free it from the underlying cremaster muscle and the arching fibres of the internal oblique muscle and to display the outer border of the rectus sheath as well as the insertion of the rectus muscle from the pubic bone. The lower leaf is then likewise clipped and retracted downwards and outwards to display the recurved medial aspect of Poupart's ligament and its point of insertion into the pubic spine.

In the upper part of the wound the ilio-hypogastric nerve will be seen coursing downwards to disappear in the region of the pubis, while a little below this, lying on the surface of the cremaster, is the ilio-inguinal nerve, which must on no account be damaged during the subsequent dissection.

In the case of a long-standing oblique inguinal hernia with an unusually large sac and a wide neck, the sac is isolated from the cord and the neck of the sac is clearly defined *at* the internal ring, twisted, ligatured, and divided. In the case of a direct inguinal hernia I make it a rule neither to disturb the sac in any way nor to attempt to ligature or invaginate it.

The object of the operation is to produce a solid, flat, uniform fibrous silk sheet to protect the whole of the posterior wall of the inguinal canal and at the same time to provide a suitable aperture for the passage of the cord at a newly reconstructed and more laterally placed internal ring. This is obtained by constructing a lattice with a twenty-inch strand of floss silk threaded on a small curved round-bodied trocar-pointed needle. The cord is lifted upwards and out of the way in the loops of Morant Baker forceps and the suture is introduced by taking a good bite of the deep aspect of Poupart's ligament, first of all at its point of insertion into the pubic spine and then through the lateral tendinous fibres of the rectus muscle at its origin from the body of the pubis.

The end of the suture is not tied at this stage, but is left long and caught up in the jaws of artery forceps. The suture is then continued in a lateral direction—i.e., towards the internal ring—taking first a bite of the ilio-pectineal ligament, then of the recurved edge of the inguinal ligament, including Gimbernat's ligament, then a bite on each side of the cremaster, then of the conjoined tendon, and then back again to the ilio-pectineal ligament and Poupart's ligament. Cooper's ligament is approximated to the innermost margin of the inguinal ligament to obliterate the

crural canal, thereby guarding against the possible subsequent formation of a femoral hernia.

When the crural canal has been efficiently closed from above, the suturing is continued laterally, the conjoined tendon and internal oblique muscle being drawn over to the recurved edge of Poupart's ligament until the internal ring is reached. The stitches are placed almost vertical and side by side, and must not be pulled upon in such a way as to strangle the tissues or to drag the inguinal ligament out of its normal alignment. When the internal ring is approached the cord is drawn firmly outwards and slightly downwards by making traction on the Morant Baker forceps, and the upper and outer margins of the internal oblique are retracted upwards and outwards. The internal ring—or rather the *new* internal ring—should always be reinforced, and in placing it as far as possible from the external ring care should be taken not to compress the cord unduly at its point of emergence from the abdomen. This reinforcement is best carried out as follows:

The floss silk is knotted or locked on the curved edge of the internal oblique, just above the reflected cord. It is carried transversely across above the cord, passed through the internal oblique muscle and locked, and then passed downwards to pick up the edge of the inguinal ligament lateral to the cord. Lastly, three sutures are repeated in the reverse direction, being knotted or locked at each angle so that the emerging cord is buttressed and surrounded by a double ring of reinforcing floss silk. From this point the suture is carried towards the medial end of the canal with a wider transverse, picking up the external oblique muscle or conjoined tendon and anchoring this structure to the inguinal ligament.

At the extreme medial point of the canal the free end of the suture, after once again passing through Gimbernat's ligament, through the periosteum of the pubic spine, and through the dense fibres of the origin of the rectus muscle, is tied to the end which was left long and is steadied with artery forceps. The edges of the aponeurosis of the external oblique are then sutured behind the cord, using a continuous suture of No. 00 twenty-day chromic catgut, thus placing the cord subcutaneously. The wound is now closed.

In order to avoid the formation of dead spaces in which serum may collect and thus predispose to infection, stitch abscess, and so forth, the subcutaneous tissues and the fasciae of Scarpa and Camper on each side of the wound are evenly and accurately approximated with a series of closely placed interrupted sutures of the finest plain catgut. The skin edges themselves are closed with vertical mattress sutures of deknatel or fine silk and a few Michel clips, after which a simple gauze dressing is applied, this being kept in position by means of a broad piece of flexible elastic strapping. The Michel clips are removed at the end of forty-eight hours and the skin stitches on the fourth day. It is most important to keep the patient in bed for a period of not less than three weeks.

Conclusion

It will thus be seen that much importance is attached to strengthening the whole of the posterior wall of the inguinal canal, especially its medial aspect, where recurrence is so prone to occur, and to closing the crural canal from above, thereby preventing the possibility of a subsequent femoral hernia such as is sometimes seen following even a most thorough operation for direct inguinal hernia.

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Clinical Memoranda

Herpes Zoster with Muscular Paralysis and Disturbance of Sensation

In the *Journal* of February 15 (p. 234) Drs. Carter and Dunlop drew attention to instances of paresis following upon herpes zoster. A case of like nature under my care is of interest on account of the severity and wide distribution of the motor and sensory disturbances which have accompanied the herpetic symptoms.

CASE REPORT

The patient, a man aged 68, was apparently vigorous and healthy, with no history of previous illness of importance. The Wassermann reaction was negative. In October, 1940, he had an attack of pain in the neighbourhood of the left hip and thigh and the outer aspect of the left leg; this was accompanied by an eruption of herpetic vesicles on the left buttock and by a simultaneous foot-drop on the left side. The general symptoms were slight, and he was able to continue at fairly laborious work. The pain was troublesome for about two months and then gradually subsided, so that at the end of three months it amounted to little more than discomfort. The pain was not aggravated by bending down and did not interfere with his work, and was thus unlike that usually present in sciatica.

The case came under my observation on February 11, 1941, four months after the onset. On examination the scars of a few herpetic vesicles were present on the inner part of the left buttock. All the muscles of the left thigh and leg exhibited a generalized wasting, moderate in grade, with the exception of the anterior tibial group, where the wasting was extreme. The tibialis anticus, extensor longus digitorum, and extensor proprius hallucis were paralysed, with reaction of degeneration and resultant complete foot-drop. No paresis was observed in other muscle groups. Both knee-jerks were active; the left ankle-jerk was diminished, and the right ankle-jerk still more so, being barely perceptible. Hyperaesthesia was present on the outer and anterior aspects of the left leg, with patches of hyperaesthesia along the anterior and posterior borders of this area. Hypo-aesthesia of higher grade, involving both pin-prick and light touch, was also present on the dorsum of the left foot, extending from the ankle-joint to the root of the toes. There was no disturbance of sensation in the neighbourhood of the site of the herpetic vesicles on the left buttock.

On March 11, one month from the previous examination and five months from the onset, there was distinct evidence of amelioration of the symptoms. Tonus was now present in the anterior tibial group of muscles, assisted by faint voluntary power in the peroneus tertius, which had previously been inactive. The hypo-aesthesia of the leg had been replaced by hyperaesthesia, particularly in the form of tingling on percussion. The hypo-aesthesia of the dorsum of the foot was unchanged.

COMMENTARY

The motor and sensory symptoms do not correspond to the distribution of peripheral nerves, and they have not the character of a root syndrome. The paralysis of the anterior tibial muscles corresponds to a lesion of the L4 and L5 segments, the sensory changes in the leg and foot to the S1 and S2 segments, and the herpetic symptoms to the S3 segment. Taken together the features are those of a diffuse affection of the cord, almost entirely on the left side, involving both the motor and sensory regions of the lower lumbar and upper sacral segments and the root ganglion of the third sacral. Such widespread symptoms are in accordance with the diffuse pathological changes described in Lhermitte, as quoted by Carter and Dunlop.

Notwithstanding the severity of the paralysis of the anterior tibial muscles the evidence of regeneration leads to the expectation of some measure of ultimate recovery.

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Reviews

THE STATE AS AN ORGANISM

The Behaviour of Nations. An Essay in the Conduct of National Organisms in the Nutritional Field. By Morley Roberts. (Pp. 180. 12s. 6d net.) London: J. M. Dent and Sons, Ltd. 1941.

Mr. Morley Roberts has long been known as a distinguished exponent of the application of biology to sociology. In *The Behaviour of Nations* he is a Sherlock Holmes to Dr. Watson's "behaviourism." He modernizes the tradition he admires of Hobbes and Machiavelli (also of Malthus, whom he does not, however, mention) into biological language and comes to some depressing conclusions. Like Hobbes, he visualizes the State as an organism, though as a lowly invertebrate and not as a leviathan. Although Lord Samuel in his *Belief and Action* strongly opposes any such biological conception, it has its appeal to the biologist who is prepared to accept Mr. Roberts's application of the internal tensions and mutual adaptations necessary in all metazoa to similar conditions obtaining between individuals or States. He can appreciate the analogy of an organism seeking its sustenance in a nutritional field, wherein hunger transcends all law. We can all see that now man has sold himself to the machine he must feed it; has not the invention of the internal combustion engine reorientated the whole field of international politics? We are all prepared to admit that men collectively are apt to behave less ethically than as individuals, and we have all been appalled at the return to barbarism with its accompaniments of treachery and lying. So far author and reviewer are at one. When, however, Mr. Roberts accuses people of acting as if evolution had come to an end we might retort that on his view of evolution as stated here it has no better fruits in store. Surely a static attitude. He sees Nature red in tooth and claw to the end of geological time; but, though we must admit the recurrent danger that lower civilizations are to the higher ones who have learned to value other things more than war, we are equally impressed by the development of the heptarchy into the present unity of Britain.

Mr. Roberts entirely denies the validity of morals in international relations, though recent events might give pause to that conclusion. Yet even with him morality will keep "breaking through." Thus he admits (p. 66) that "morality arises from the evolutionary necessity that . . . nations themselves must learn . . . to put up with each other and refrain, so far as their tropisms and instincts permit, from acts harmful to social life." Again (p. 63), "I begin to think that nations will presently look with . . . dislike on the practice common in some countries of insulting aliens," for (p. 62) "there is little doubt that any nation feels deeply, whatever it may say, if it is aware that no one willingly associates with it." While maintaining that science must work by the driest light, and without passion, "dismissing mere prejudice in favour of cold observation and bloodless logic," Mr. Roberts nevertheless directs shrewd if not angry blows at those who disagree with him, and especially at politicians who ignore his gospel. With D. H. Lawrence he regards instinct as infinitely more likely to disclose the right course than the intellect. Stronger, yes; but safer? This curious tendency of intellectuals to denigrate the intellect in books presumably written for intellectual readers is an interesting symptom of this unreasonable age.

This book completes the trilogy starting with *Warfare in the Human Body* and continued in *Bio-politics*, flanked by *The Serpent's Fang* and *Evolution and Malignancy*: a remarkable series, even if not gaining universal acceptance. For Mr. Morley Roberts's writing never lacks distinction, and in the present book he rises to almost lyrical heights (as befits an old sailor) on the influence of the sea on history, while the chapter on mass migration is full of fascination. His study of national temperaments, particularly of German claustrophobia, is of great topical interest. No doubt at the present moment his astringent philosophy may serve as an antidote to dangerous complacency, but it is interesting to contrast his bleak pessimism with the tempered optimism of *Man on his Nature* by Sir Charles Sherrington, whose status as a biologist Mr. Roberts will readily admit.

CEREBROSPINAL FEVER

Cerebrospinal Fever. By Denis Brinton, D.M., F.R.C.P. (Pp. 164. 8s. 6d., plus 6d. postage.) Edinburgh: E. and S. Livingstone. 1941.

The treatment of cerebrospinal fever has been perhaps more completely revolutionized within the past few years than that of any other disease. Not only has chemotherapy entirely replaced serum treatment—whereas in some other infections the two are still combined—but even spinal drainage by repeated lumbar puncture is now often looked upon as superfluous. At the same time opinion has changed on certain aspects of the epidemiology of this disease. Its prevalence is so irregular that many practitioners have had little experience of it. These are three good reasons why a fresh account of the whole subject should be published, and Dr. Denis Brinton furnishes this in a modest volume entitled *Cerebrospinal Fever*, which deals with the disease from every aspect, but most fully with its clinical diagnosis and treatment.

The forms of meningococcal infection described include not only meningitis of different types, but both the fulminating and chronic forms of meningococcal septicaemia. The instructions given for treatment are clear and dogmatic. It is first laid down that every case should be treated in hospital, and the practitioner is very properly warned that if he begins sulphonamide treatment before the admission of the case to hospital the amounts given should be stated, and a specimen of cerebrospinal fluid secured before chemotherapy has rendered a bacteriological diagnosis difficult or impossible. The scheme of dosage adopted by Banks is recommended, and sulphapyridine is the drug chosen, sulphanilamide only being given for a short period if the former causes vomiting. This is orthodox practice, and if the concentration in the cerebrospinal fluid necessary to secure a given therapeutic effect is lower in the case of sulphapyridine that is an adequate explanation of any greater therapeutic efficiency which this drug may possess, but the reiterated statement that sulphapyridine is less toxic than sulphanilamide must be disputed. It is recommended that a blood count should be done after 30 grammes have been given; this is a sensible rule for guarding against the remote possibility of granulocytopenia. Not only is drug fever described, but the rash accompanying it is the subject of the only illustrations in the book, of which there are four. This complication occurred in 16 of a series of 46 cases observed by the author. It is so often mistaken for a recrudescence of the disease, and consequently treated in the opposite of the correct way, that an emphatic warning against this error would be a useful addition.

In a discussion of pathogenesis, Le Gros Clark's studies on the spread of material from the nasal mucosa to the base of the brain are disregarded; it is by no means as certain as the author would have us believe that meningococcal meningitis is haematogenous. No attempt is made in discussing epidemiology to explain the still mysterious aspects of this subject, and the current teaching that carriers should not be sought for is accepted.

DISEASES OF THE CHEST

A Practical Manual of Diseases of the Chest. By Maurice Davidson, M.D., F.R.C.P Second edition. (Pp. 576; illustrated. 42s. net.) Oxford Medical Publications. London: Oxford University Press. 1941.

The busy practitioner, or the student working for a higher examination in medicine, requires something more than his undergraduate library, but is usually unwilling to strain his purse, bookshelf, or mind with cumbersome manuals of special subjects. He is interested in practice rather than in theory, and especially in modern developments in medicine. The second edition of *A Practical Manual of Diseases of the Chest*, by Dr. Maurice Davidson, is well planned for this purpose: it is well illustrated, liberal use has been made of reports of the author's own cases, and its length is less than 600 pages.

Most textbooks which are original, and not merely a copy of others, are easy to criticize in matters of detail, and this is no exception. For instance, it seems unfortunate that sulphapyridine in the treatment of pneumonia is dismissed in twenty lines, although two and a half pages are devoted to serum therapy; and although the dangers of agranulocytosis are stressed, there is no mention of the commoner forms of idiosyncrasy which frequently interfere with sulphapyridine treatment. Many physicians would disagree with the statement that atropine in doses of 1/50 grain is urgently indicated in acute pulmonary oedema, and those in practice would be more interested in the simpler methods of withdrawing air from a spontaneous pneumothorax than with an artificial pneumothorax apparatus or trocar and cannula.

Other minor criticisms could be made, and yet this book should be a useful addition to any medical library; it contains much well-organized information and will be of value to all those interested in clinical medicine.

BOMBING AND PLANNING

The Lesson of London. By Ritchie Calder. (2s. net.) Searchlight Books, No. 3. London: Secker and Warburg.

Start Planning Britain Now. A Policy of Reconstruction. By Ritchie Calder. (1s. net.) London: Kegan Paul, Trench, Trubner and Co. Ltd.

Ritchie Calder is an accomplished journalist with a passion for finding out the truth about all and sundry matters and for setting down in print the truth as he sees it, no matter how unpalatable it may be to those in authority. His fearless disregard of personalities and powers, coupled with a capacity for acute observation and shrewd deduction, well fit him to tell the story of London under aerial bombardment. He describes again the tragic and fatal muddle in the dock area last September, and the heroic efforts of the East London clergymen to counteract the harm of official inertia and lack of imagination. He has penetrating things to say about evacuation, the care of the homeless, feeding centres. But we question the justice of his generalization, "Family doctors saw in the shelter clinics a threat to their fees," and suspect this to be an argument from one or two particular cases to the general. And in view of the shelter conditions described by Mr. Calder they would not seem to be (whatever they might become) ideal for clinics where "incipient diseases could be discovered and checked." Nor is it clear why, because of shortcomings and dislocation of practices, the "State should intervene and [that] there should be a complete and salaried medical service." Would Mr. Calder advocate the same remedy for his own profession of journalism? Apart from these points of criticism, his book is a useful war document, and deserves to be widely read.

Start Planning Britain Now may best be described as a series of vigorously written notes on the chief aspects of the problem; it is a compact "planner's guide." In just over two pages Mr. Calder plumps for a "salaried medical service," and in this, as the columns of the *Journal* have shown during the past year, he has the support of many doctors. This small book of sixty-three pages has much in it that is provocative and stimulating.

Notes on Books

A little book of some sixty pages, *Administrative Notes for Royal Army Medical Corps Officers*, by Major J. COHEN, is published by Gale and Polden, Ltd., of Aldershot, at 1s. 6d. There is so much to be learnt in so short a time by R.A.M.C. officers young in the Service that everything possible must be done to help them. The practice of "spoon-feeding" is to be condemned in normal circumstances, but the circumstances of to-day are abnormal. These methods of training are bad; the newly joined medical officer must find out things for himself. Every scrap of essential information will be found in official manuals, handbooks, and pamphlets, which are issued to all concerned. Abstracts and notes should be compiled and kept for ready reference in the field by the officer himself, who should be discouraged from relying on pabulum prepared by others. The pamphlet under review was evidently prepared many years ago, and no attempt seems to have been made to keep the material up to date. We have not space to point out all the inaccuracies and omissions. The war establishment of a field ambulance is incorrectly given; no mention is made of the light field ambulance. Little is said about message writing or about armoured or mechanized formations. The road spaces given are pre-war, and nothing is said about the scatter and dispersal layout of medical establishments. It is a pity that the data were not checked, criticized, and corrected by a senior serving officer before publication.

Preparations and Appliances

LOCAL ANAESTHETICS

"Anethaine" brand of butethanol (Glaxo Laboratories, Ltd.) is stated to be "an extremely powerful local anaesthetic chemically allied to procaine and identical with a widely used substance hitherto only produced abroad." The chemical constitution is stated to be 4-butyl-amino-benzoyl-dimethyl-aminoethanol hydrochloride. It is about twice as toxic as cocaine, but has ten times as powerful a local anaesthetic action. It can penetrate mucous membrane and therefore can be used as a surface anaesthetic in the eye, nose and throat, urethra and rectum. The vendors advise that it should not be injected subcutaneously.

"Sevicaine" brand of procaine hydrochloride (Glaxo Laboratories, Ltd.) is issued as a 1% solution suitable for infiltration anaesthesia and as a 2% solution with 1 in 60,000 adrenaline hydrochloride for terminal and regional anaesthesia.

IMMUNIZATION AGAINST SCARLET FEVER

Lederle Laboratories announce the issue of an improved streptococcus toxin for use in immunization against scarlet fever. Unpleasant reactions following administration are claimed to be greatly reduced by substitution of peptone in a concentration not exceeding 1 per cent. of blood or serum in the preparation of this toxin, without loss of immunizing properties. The product is marketed in this country by Chas. F. Thackray, Ltd., Leeds.

GENTIAN VIOLET JELLY

Allen and Hanburys, Ltd., have placed on the market "Geviflex," a gentian violet jelly for application to burns, etc., as an alternative treatment to tannic acid. It contains 2% gentian violet with phenyl mercuric nitrate 1/3,000. The latter is a germicide of low toxicity. "Geviflex" is packed in tubes containing 1½ oz. and 5 oz. at 1s. 11½d. and 5s. 10d. each respectively, including purchase tax.

BRITISH MEDICAL JOURNAL
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TRAUMATIC EPILEPSY

Once again gunshot wounds of the head are causing an increase in the number of epileptics. Neurologists are debating prognosis, neurological surgeons are discussing the safest treatment of damaged brain, and medical boards are thrashing out the old questions of causation and attributability. But in this war cerebral gunshot wounds are a civil as well as a military problem, and the management of traumatic epilepsy will be the concern of many. This is, therefore, an apt moment for publishing Ascroft's report[1] on the incidence of epilepsy occurring after gunshot wounds inflicted in the last war. His analysis of the Ministry of Pensions records of 317 cases of gunshot wounds severe enough to lead to the granting of a pension shows that as many as 34% of the cases are known to have developed epilepsy; as they were all pensioned after appearing before several medical boards the evidence is convincing. Attacks now considered to be on the borderland of epilepsy would not be included in this total, so that the figure quoted is not an overstatement. Epilepsy developed in 24% of patients with gunshot wounds involving only the scalp, while twice as many had fits after tearing of the dura with cerebral laceration. These figures are much higher than those recorded by Wagstaffe,[2] who, after a similar survey of casualties from the last war, found epilepsy in only 1.6% of cases suffering from scalp wounds alone, and in 19% of those with dural penetration. This may be compared with the corresponding figures of Villaret and Bailby[3] of 6 and 16% in 500 cases. There are reasons for the discrepancy. Ascroft's group included only patients who, having survived for more than four years, were granted a pension, and observations were made over a follow-up period of twenty years, whereas the other authors reported their findings soon after the injury and on less highly selected material. There is no doubt that many attacks later shown to be epileptic were not included.

Thus we have the hard fact that epilepsy develops in a third of the cases with an open head injury severe enough to warrant a pension, and in nearly half of those with dural penetration. But this result is not so bad as it appears superficially, for in one-third of the patients the epilepsy was transitory. The first fit occurs most commonly within fourteen days of the injury—often within a few hours—and patients who develop these immediate post-traumatic convulsions have a reasonably good prognosis, for their epilepsy tends to be short-lived. This observation is contrary to the general belief, supported by the figures of Feinberg[4] and others, that traumatic epilepsy most often appears between six and twelve months after the injury has been sustained. It agrees, however, with the observation of Symonds[5] that if the minor attacks which occur within a few days of the cerebral insult are recognized the prognosis in traumatic epilepsy is far from gloomy. On the other hand, Ascroft's figures and those of other workers show that when the fits begin more than a year after the injury the prognosis is usually bad. Feinberg, on the basis of 47,000 insurance cases of head injury, including the most trivial, found undoubted epilepsy in less than 1 in 1,000. But in this war we have to deal with far more severe injuries than occurred in most of his series. Aldren Turner[6] and Wagstaffe both found that parietal injuries were most likely to be followed by epilepsy: in this they are supported by Ascroft, for half of his cases with injury to the Rolandic area developed fits. Even here the fits are not necessarily Jacksonian; only a third of the total had a focal onset, and most of these presumably were generalized grand mal attacks. Symonds found Jacksonian epilepsy in only 7% of his series, and it is well recognized that focal epilepsy is commonly idiopathic. As Jefferson[7] pointed out, the belief that Jacksonian and traumatic epilepsy are synonymous and reversible terms is untrue in the great majority of cases.

Ascroft's valuable analysis is not entirely discouraging. It does give us hope for better results in the future. Interference with buried fragments, sepsis, and delayed healing all greatly increased the incidence of epilepsy, and with the experience and materials at our disposal to-day we can surely expect great improvement in this respect. Lennox[8] has shown that many traumatic epileptics come from families with a tendency to this disease, and it now seems that the difference between traumatic and idiopathic epilepsy is one of degree only. When modern surgery has done its best to minimize the risk, the fact remains that in predisposed subjects a head injury tends to unmask the predisposition. The ultimate control of the disability is linked with an understanding of the pathogenesis of idiopathic epilepsy, which is at present beyond our grasp.

DEATHS BY VIOLENCE

In England and Wales in 1937 nearly 23,000 persons died violent deaths. None of these deaths was due to war, but a study of this section of mortality has a certain interest at the present time; consideration of the gas-oven suicide or the overlaid infant has a wholly different atmosphere from that which attaches to deaths from high explosives. It was from this point of view that Prof. M. Greenwood and Drs. W. J. Martin and W. T. Russell presented to the Royal Statistical Society on April 15 a paper in which they surveyed the statistics of deaths by violence during the century of registration. In the seventeenth century deaths by violence accounted for not quite 1% of all deaths, but in 1938 in the County of London 4.5% of the deaths were so designated. This does not necessarily mean that the modern Londoner is more likely to be murdered: it simply means that in the past "natural" deaths were more frequent, and that death-dealing machinery was less

1 *British Medical Journal*, 1941, 1, 739.
2 *Lancet*, 1928, 2, 861.
3 *Presse méd.*, 1927, 35, 289.
4 *Epilepsie und Trauma*, by P. Feinberg, Zurich, 1934.
5 *Lancet*, 1935, 2, 1217.
6 *J. Neurol. Psychiat.*, 1941, 3, 303.
7 *Medical Annual*, 1934.
8 *Arch. Neurol. Psychiat.*, 1940.

in evidence. No precise comparison can be made, however, of the rates of mortality even since 1837, when registration of deaths became a national concern, because there have been so many changes of classification—for example, in 1861 deaths from intemperance and from deprivation of food were no longer classed as violent, and in 1901 deaths from food poisoning, injury at birth, and drug addiction were removed from this category, though deaths from privation and food poisoning were restored in 1911. Taking all forms of violence the standardized rates per million in the decade 1861-70 were 1,169 for males and 349 for females, and in the quinquennium 1931-5 these had fallen to 648 and 260 respectively. Taking rather different periods but with the same interval, in the years 1863-70 the male death rate per million due to accidents in coal-mines was 96, to vehicles 195, to drowning 214, and to burns, scalds, and suffocation 182, while the corresponding figures for 1931-8 were 40, 260, 58, and 49. The female death rate in these categories is smaller (except for burns, scalds, and suffocation, where it is equal to that in the male), but the trend is the same. It was in 1896 that the first deaths—those of one male and one female—were registered as due to motor-cars, and the first deaths due to motor-cycle accidents were those of two males in 1902. Infant deaths from overlying were examined by the Registrar-General in 1890, when he found that one-fifth of such deaths occurred during the first month of life, that 60% of them occurred during the winter six months, and that these deaths were twice as numerous on Saturday nights as on any other night of the week. The assumption that the drunkenness of the parents was responsible for the weekly peak cannot be wholly justified. Many of the deaths certified as overlying were probably due to pneumonia.

The authors devoted the greater part of their paper to the question of suicide, of which there has been a large increase during the twentieth century, especially among women. The standardized suicide death rate per million for females in 1901 was 46, and it kept within the forties until 1924, except for the two war years, 1916 and 1917, when it fell to 38 and 35; but in 1925 it went up to 50, and has never fallen below that figure since then, even reaching 65 in 1933. Suicide rates are low among nuns and teachers other than music teachers (though what the rate is amongst music teachers and whether it shows any significant difference was not stated), and high among the wives of unoccupied males. Suicide is relatively more frequent among the black-coated class. The authors gave a table based on the figures for the period 1930-2, which suggested that in males in professional occupations the highest rates were in the legal profession, and then, in diminishing numbers, among dental practitioners, officers in the Forces, authors and journalists, and physicians and surgeons; while in the class of manual workers the highest rates (but on a lower level than generally in the professional classes) were among barmen, costermongers, newspaper sellers, and dock labourers. As for the methods of self-destruction, the most striking feature is the increasing preference for the gas oven. In 1936-8, 31.5% of all male suicides and 42.2% of all female made use of coal gas, which was not readily accessible for this purpose before the turn of the century and only became "fashionable" after the last war. The conveniences of modern life are factors of as much importance in the suicide rate as its stresses and strains. War has hitherto had the effect of lowering the number of suicides, though what the effect may be of the present mass terrorism cannot yet be judged. Homicide has steadily decreased. The death rate per million due to murder and infanticide, which in 1863-70 was 12.5 for males and 11.1 for females, has fallen consistently, until in 1936-8 the figures for the sexes were 2.0 and 3.3.

On the whole, violent deaths were diminishing, though the decline was retarded by the multiplication of instruments of violence, which may be expected to continue. "Unless the experience through which so much of the world is now passing excites such a passionate hatred of the air that aeroplanes are classed with opium and proscribed, civil aviation may well compete seriously with motoring as a cause of death." But Prof. Greenwood added that such proscription would be a fantastically improbable display of herd intelligence.

SCABIES AND IMMIGRATION

Scabies is a disease which periodically draws attention to itself because of the gross amount of irritation it causes in certain communities. It is difficult to control in the herd, and difficult to prevent in the individual. In two recent articles Dr. Reuben Friedman[1] traces the history of scabies in the United States. The early history is conjectural, but it is probable that the disease was introduced into the American colonies by the pioneer colonists. That the condition was prevalent enough to be a gold-mine for prospecting quacks and less scrupulous qualified practitioners is shown by the frequency with which advertisements for so-called cures appeared in philosophical and scientific magazines. Even Benjamin Franklin, one of the greatest of scientists, did not escape entirely from association with such practitioners; his mother-in-law, the widow Read, advertised frequently in the *Pennsylvania Gazette* a cure which in ointment form had a pleasant smell and could be used "without the least Apprehension of damage even to a Sucking Infant." There is no indication whether the price of two shillings an ounce was extortionate or otherwise, nor does there seem to be any corroboration of the widow's claim that this quantity was "sufficient to remove the most inveterate Itch and render the Skin clear and smooth." This advertisement appeared in 1731, and in later years there was less emphasis on the prevalence of scabies. From records appearing in the earlier medical journals it is apparent that scabies made up only from 0.3 to 2% of skin conditions seen in large general hospitals. In other words there was no epidemic. Towards the middle of the 'eighties the proportion of cases of scabies seen at these hospitals rose steeply, and, what was more significant, skin specialists began to see such patients in their private practice. Greenough, in 1886, commented on this frequency at the Boston Dispensary and ascribed the increase to three factors—contagiousness, the fact that the disease was self-limited, and the free circulation which existed between cities and country districts. In 1889 White ascribed the prevalence to an increase in the crowding of operatives in the factories of large cities, and to the growing number of commercial travellers. The true cause of the increased incidence—namely, the effect of immigration—was given by White in the following year, and he then stated that

[1] *Ann. med. Hist.*, 1940, 2, 393, 401.

the means of prevention were simple. As he says, "If all immigrants were carefully inspected at quarantine and every one affected were submitted to a three-hours treatment, as in the quick cure of foreign military hospitals, we might before long reduce the prevalence of scabies to its former low percentage." Despite the sanguine view taken by White the expected decrease did not come until very much later. Other authors—for example, Hyde and Montgomery in 1904—speak of the increase in immigrants. Stelwagon says that the introduction of a few immigrants from a foreign country into an unaffected centre of population often gave rise to a skin condition which the local inhabitants were quick to stigmatize with the nationality of the immigrants. Hence there arose terms such as "Italian itch" and "Hungarian itch." Hyde, in 1905, stated that "the fruitful and unfailing source of scabies in North America is Europe, and in particular the crowded residents of the Old World." He believed that contributory causes were the aggregation of human beings which occurred at the holding of a great fair, and also war. At the present time we are spared some of the effects of immigration, but this country is in the throes of war; the effect of heavy bombing brings people together in much less favourable conditions than exist during large fairs or exhibitions. There are definite grounds for believing that the authorities are succeeding very well in treating cases of scabies as they arise, but the disease is again a major epidemiological problem. It would be bold to state that excessive prevalence can be prevented, and in these times it is useful to go back to the old records.

BRONCHITIS AND OTHER INFECTIONS IN WAR

It is a truism to say that deaths from violence are not the only, and not necessarily the largest, contributions to war mortality. The present conflict is likely to be no exception to the rule, although, with greater knowledge and much more effective methods of control than before, the emphasis may well fall on very different causes of death. Small-pox, for instance, may hold fewer fears for us, though it is no source of complacency to know that many infants are still not vaccinated. The enteric fevers have already been kept in check, in spite of damaged water supplies. On the other hand, there is some indication of the expected rise in tuberculosis. In reply to a question recently addressed to him, the Minister of Health stated that the number of deaths from all forms of tuberculosis in the second quarter of the year was 7,116 in 1940, compared with 6,863 in 1939 and 6,973 in 1938. Some control, by no means full, can be assumed here. In the last war there was the influenza pandemic of 1918-19. It fell equally on the sanitarily just and unjust, as the Registrar-General observed, and we are to-day very little if at all nearer averting its development on a major scale. So far we have escaped, and the course of the common infectious diseases in Great Britain has, too, been very favourable. Cerebrospinal fever, invariably a camp-follower, is the one exception, with an incidence in 1940 of at least ten times the normal—though with modern methods of treatment it will have a lower mortality. A close watch is no doubt being kept in official quarters on these and other pointers to the state of the public health. It is not so easy for those outside Government Departments to study the trends of disease and mortality and thus to draw attention to any untoward developments. There is delay, more perhaps than would seem inevitable, in publishing the national records. The Registrar-General's annual report for 1938 is still the last available. There are, too, the vast changes in the distribution of the population due to evacuation and conscription, and no one without access to official records can assess their influence.

One record that has, fortunately, been issued with regularity is the Registrar-General's weekly report, which offers at least two features of interest—namely, the notifications of infectious diseases in the country as a whole and in different parts of it, and the causes of mortality in the County of London. Using the latter data, Prof. R. M. F. Picken contributed in last week's *Journal* (p. 744) an interesting study of the mortality attributed to bronchitis in London since the war. He observes that though the total mortality in 1940 (excluding for obvious reasons deaths from violence other than suicide) was not appreciably different from the average of the previous ten years (44,548 deaths against an average of 48,805 in 1930-9), there was a very large increase in deaths debited to bronchitis (4,675 against 1,915). Two questions present themselves: How far is this rise real? and, How far is it attributable to war conditions? The main case for doubting its reality lies in the change that has taken place in tabulating causes of death when more than one appear on the certificate; arbitrary rules of tabulation gave way in 1940 to acceptance so far as possible of the certifying practitioner's order of preference. This change would be likely to add to the figures for bronchitis and to reduce those for heart disease, and Prof. Picken's study of the relevant figures leads him to the conclusion that a large part of the rise in bronchitis mortality is in fact fictitious. Part, on the other hand, seems certainly to have been genuine, and cannot be ascribed to influenza, which has been relatively absent. Its incidence followed the normal seasonal course, so that, in so far as there was a real increase in mortality from bronchitis in 1940, most of it was in the early part of the year—before resort to shelters became either necessary or frequent. A severe winter was the most noticeable feature of the period. In 1941 the cold spell was less severe and came later in the year; the peak of bronchitis deaths was also later. Prof. Picken's conclusion, therefore, is that, though the black-out may have increased the influence of ill ventilation which always accompanies cold weather and favours respiratory infection, it is most probable that the observed increase in mortality from bronchitis was due mainly to the exceptional weather conditions and not to special circumstances arising from the war.

FUNCTIONAL VASCULAR DISTURBANCES IN THE BRAIN

The study of what may be called the vascular factor in brain physiology and pathology has had its vicissitudes. The triumphs of staining methods for nerve cells and fibres fascinated brain histologists in the pursuit of still more refined ways of exposing the peculiarities of brain tissue itself, while the study of the physiology of the neuron, aided by technical developments in electrophysiology, has proved equally seductive to the experimental neurologists. Both kinds of technique had the advantage that they could be followed to a considerable extent *in vitro*; while the problems of the vascular supply to the brain, partly because they implied an intact animal, had, so far as possible, to be approached functionally, and so were for a time relatively neglected. This tendency in research was aided by the declination of some physiologists that the blood supply to the brain, unlike that of other organs, had no nervous control of its own, and so could not be conceived as being dynamically related to brain function in the way that might by analogy have been anticipated. Of recent years, however, the reverse opinion has been widely accepted, and physiologists and pathologists alike have turned to variations in the blood supply to local areas of the brain to throw new light on its activity. An example is a recent

paper of Helfand's[1] on the effect of trauma on animal brains. He goes so far as to suggest that the variations in vascular supply to different regions of brains injured by the dropping of weights on the skull may depend on the transmission of local vascular reflex disturbances travelling by the meningeal vessels to the superficial layers of the cortex. In this way, it is suggested, it may be possible to explain the occurrence of local disturbances varying from complete absence of visible capillaries to local engorgement accompanied by diapedetic exudation, in contrast to the relative uniformity of capillary patterns throughout the normal cortex. Such observations were made more possible by the use of the benzidine stain introduced by Pickworth. Brain histology has for many years been rather neglected in this country except in one or two laboratories, and it is encouraging to find a technical advance which is indigenous.

The relation of such observations on the normal vascular pattern to the understanding of mental disorders is another question. Not many will be willing to go as far as Pickworth,[2] who enthusiastically declares that "it is believed that the exact locality within the brain of such vascular effects, duly considered in relation to duration and development growth, determines the type of mental disorder and defect." This seems to contradict the existing knowledge of lack of association between locality of lesion and type of mental symptom; nor will many agree that "consciousness is made up of tensions, throbs, pangs, flushes, suffocations, etc.," and nothing else. But such enthusiastic notions stimulate us to consider that the capillary flow may warrant more attention than it has received hitherto. It has also been shown that the function of a particular region of the brain is accompanied by capillary dilatation there—for example, in the olfactory lobe of a rabbit when its smell apparatus has been stimulated, and in the occipital lobe as the result of visual activity. In pathological conditions more may be attributable to capillary obstruction in some instances than to direct toxic action on nerve cells. In tetanus and chorea, for example, thrombi are found in the vessels. It has been argued that the anoxaemia resulting from endarteritis is a cause of the parenchymatous change in general paralysis, and it has even been maintained by Hutton[3] that the endarteritis itself, so far as the smaller vessels are concerned, is a result of anoxaemia. Vascularization means, of course, oxygenation. It seems more and more likely that the physiopathology of the brain and the symptoms of the so-called symptomatic psychoses are ultimately matters of oxygen supply to brain cells. Even the constitutional psychoses may depend on episodic or chronic inadequacy of oxygenation of individual cells, and the effects of the new convulsion therapy may depend on the promotion of capillary dilatation.

SURGICAL ANTISEPTICS TO AVOID

The war brings with it fluctuating difficulties in the supply of various materials used in everyday medical practice, and some of these, also, are urgently needed in the armament industry. Glycerin is an obvious example, and, in combination with iodine, was recently advocated in these columns for the treatment of wounds sustained in air raids. If there are other applications equally efficacious—as indeed there are—they should be used in preference to any that contains glycerin. Another substance we would urge practitioners to use sparingly is alcohol, whether in the form of surgical spirit or of medicinal tinctures. The use of surgical spirit is a familiar ritual, but it may be recalled that Colebrook showed that dettol applied to the skin is remarkably effective in killing surface bacteria. In the whole field of surgical antisepsis the practitioner should ask himself what other antiseptic would do just as well as spirit and use it. We hope to publish a further statement on this subject.

[1] *Psychiat. Quart.*, 1941, **15**, 33.
[2] *J. ment. Sci.*, 1941, **87**, 50.
[3] Ibid., **87**, 1.

THE TAVISTOCK CLINIC

The Tavistock Clinic (the Institute of Medical Psychology) has just issued its report for 1940, the twentieth year of its existence. All concerned with the clinic are entitled to congratulations, for the report shows that, in spite of the untoward circumstances and the consequential loss of staff, both medical and lay, and change of location, the clinic has been able to maintain uninterruptedly its useful activities. It has left Malet Place and is now housed at Westfield College, Kidderpore Avenue, Hampstead, N.W.3. It has not been possible to re-establish its small in-patient department, but the spirit and tradition of the institution have been preserved and sustained. It was not until the last quarter of the year that there was a significant and serious fall in the number of patients. This is ascribed to the intensified air raids on London and the large evacuation of children and exodus of considerable numbers of the popuation. The report, however, says that "during the last few days of the year there was a marked increase in the number of applications for treatment. This may be attributed to improved adaptation on the part of patients to the difficulties and risks of travel rather than to an increased incidence of neurosis. We can confirm the fact that bombing has so far produced few cases of breakdown among civilians." In its earlier years the clinic suffered from a certain scepticism and aloofness on the part of the generality of practitioners in regard to a relatively new field of medicine, and from the factions in psychological medicine which were then well marked. The clinic never associated itself with any of these factions and has steadily pursued its middle course, developing increasingly by intimate relationships with general medicine, and aiming, both in its teaching and research, at linking the concepts of psychopathology with the findings of the physiological laboratory and clinical practice. This report should quicken interest in the work of the clinic and encourage the support of the medical profession and of educationists and sociologists.

We announce with great regret the death at the age of 85 of Sir D'ARCY POWER, K.B.E., F.R.C.S., eminent alike for his work as a surgeon and as a medical historian, biographer, and bibliographer. Sir D'Arcy was a faithful friend to the *British Medical Journal* and its Editors, wrote many reviews and many articles and notes in the section "Nova et Vetera," and contributed the opening paper, on some memories of the *Journal* and the profession, for the Centennial Number published on October 5, 1940.

On Thursday, June 5, at 5.30 p.m., Mr. John G. Winant, the American Ambassador, will attend the Lloyd Roberts Lecture at the house of the Royal Society of Medicine in order that he may receive the Hickman Medal, awarded by the Society, on the recommendation of the Section of Anaesthetics, to Dr. A. E. Guedal of Los Angeles. Immediately after the ceremony of presentation, the Lloyd Roberts Lecture will be delivered by Prof. Julian Huxley on "Art as a Social Function." Admission of Fellows and their friends will be by ticket only. Early application should be made to the Secretary at 1, Wimpole Street, W.1.

TREATMENT OF AIR-RAID CASUALTIES

BY

S. JOSEPH HOFFMAN, M.B., F.R.C.S.Ed.

It is not proposed to advance an excuse for adding to the literature that has accumulated on the treatment of air-raid casualties. The subject is one of importance, and some benefit may accrue from the consideration of a routine technique that was gradually evolved during a year's experience of numerous raids while R.S.O. at a hospital in the south of England and later consolidated elsewhere. The total number of casualties thus far treated exceeds 700.

Method of Reception of Casualties

Early raids were fortunately on a small scale, casualties rarely exceeding fifty. Yet even these comparatively small numbers placed a severe strain on the elaborate schemes that had been evolved for the reception of patients. In theory the concept of resuscitation wards, recovery wards, hysteria wards, "awaiting *x*-ray" wards, etc., was most attractive; in actual practice it proved a complete failure. The same applied to the marking of patients with different colours to signify type and degree of injury, and urgency or otherwise of treatment. In the heat of the moment one never seemed able to remember what colour stood for what.

All previous schemes were therefore scrapped, and the existing facilities for dealing with "ordinary" accidents were merely amplified. All cases were admitted through the accident room in the usual manner. Here a rapid but comprehensive examination was made, and the findings were jotted down on a card, which was pinned to the patient's clothing. There was no attempt to decide whether operative intervention was urgently required or not, as this was deemed to lie within the province of the operating surgeon.

A careful search was made for the presence of a tourniquet, and if this was found it was removed forthwith. Usually little or no bleeding follows even when limbs have been blown off. This is because the elastic coat of the artery retracts and plugs the vessel, and the veins twist up on themselves. In the rare case in which haemorrhage was still brisk—as when a vessel had been half divided and so could not retract—an attempt was made to control it with artery forceps. If this succeeded the tourniquet was left off; otherwise it was reapplied. Finally a firm bandage over wool was applied, and this almost always controlled all bleeding. A.T.S. 2,000 units was administered as a routine, together with morphine, and the patient was then transferred to the ward. The time-honoured dosage of morphine grain 1/4 is almost without effect; a minimum of 1/2 grain and often 1 grain is required. In particularly restless and psychically shocked patients this is best given intravenously. The injection must be made very slowly, and 1/2 grain is the maximum that can be safely given in this way. The effect is almost instantaneous.

Pre-operative Treatment

Every casualty is suffering from shock and requires adequate anti-shock treatment before operation. This fact now seems axiomatic. But in the first flush of enthusiasm one tended to overlook it and to rush cases into the theatre prematurely. This was particularly so with wounds of the thorax or abdomen. It resulted in successful operations but, unfortunately, in dead patients. In fact, after the first raid our mortality rate was over 40%, in spite of every operation having been completed within six hours of the raid.

On reaching the ward the patient is transferred to bed between warmed blankets, and anti-shock treatment is started. No attempt is made to undress the patient, the clothing being merely loosened where tight. If it is necessary to expose any area the overlying clothing is cut away. Every effort is made to disturb the patient as little as possible. As a preliminary measure the blood pressure is taken. It is invaluable both as a prognostic measure and as an index of response to treatment and fitness for operation. A systolic pressure below 80 almost always means that anti-shock treatment will fail and that death will ensue.

Measures against Shock

The anti-shock measures are best described in the following categories:

1. *Rest (both Mental and Physical).*—This is attained with the morphine. If the dosage so far given is ineffective the drug is repeated forthwith, preferably intravenously in order to get an immediate effect. At the same time temporary splints are adjusted so as to ensure immobilization of injured limbs.

2. *Heat.*—This is best attained with a radiant-heat cradle. Cradles were made in bulk by the hospital electrician at a cost of some 30s. each.

3. *Fluid Replacement by Venoclysis.*—The solution of choice is plasma. It is put up in vacoliters, and the assembly of the apparatus and introduction of the needle into a vein take but a few seconds. In a moderately severe case at least four pints is required. This is to be regarded as a basic minimum and may be insufficient. It is given as a fast drip at room temperature. It must be stressed that it is useless to pour in plasma at one end if it is leaking out almost as fast at the seat of injury. Literally pints can be lost through a lacerated wound of moderate severity within a few hours. Therefore a vigilant eye is kept on dressings, and if these become moist they are immediately taken off and the wound inspected. If necessary a tourniquet is tightly applied just above the site of injury, and this effectively prevents any further plasma leak. Naturally the tourniquet is loosened at twenty-minute intervals.

4. *Oxygen Therapy.*—This is an important adjuvant in the treatment, and quite dramatic improvement may follow the correction of tissue anoxaemia. The oxygen is best given through the B.L.B. mask. This latter is practically foolproof and, once adjusted, requires a minimum of attention. The technique of application, too, is simple. But one tip to the tyro: Use either a flowmeter or else a full oxygen cylinder.

Operative Treatment

This is undertaken as soon as the maximum response is thought to have been obtained from the anti-shock therapy. It is essentially a question of surgical judgment; but in the borderline case the blood pressure gives invaluable aid. To operate while the systolic pressure is still under 100 is to court disaster. It must be borne in mind, however, that with fractures of the long bones complete recovery from the shock is not obtained until the displacement has been rectified. If thought necessary the venoclysis is continued throughout the operation.

The choice of anaesthetic is important. My preference is for sodium pentothal. I would remind those who use it, however, that the specific antidote is picrotoxin, and would suggest that ampoules of the latter kept on the anaesthetic table may prove life-saving.

Technique

This naturally varies with the site and extent of the injury. However, in all cases certain principles are observed:

(a) No more is done than is essential to save life. After all, that is the prime function of the traumatic surgeon. Therefore one errs on the side of conservatism, deferring all procedures not essential to this end until a later date. (b) Primary suture of anything except clean incised wounds is

never done. (c) Amputation is rarely performed as a primary procedure unless the blood supply is irretrievably lost.

The usual type of injury commonly involves the limbs, and it is proposed to describe the method used in dealing with such a lesion:

1. The wound is exposed, and the surrounding healthy skin (from the joint above to the joint below) is scrubbed with soap-and-water and then painted with iodine.

2. The wound itself is scrubbed with a brush and dilute lysol water—2 drachms to the pint. This stains all dead tissue a dirty greyish white, and makes its subsequent recognition easy.

3. The wound is flooded with hydrogen peroxide, and this in turn is washed out with spirit or ether.

4. All dead tissue is now excised, beginning with the skin and working inward. A minimum of skin edge is removed. An effort is made to remove all foreign bodies; and the generally expressed view, that most metallic foreign bodies can be safely left, is not agreed with. They are a potent source of chronic wound sepsis, and may be one of the predisposing factors in the development of gas gangrene. Efficiency in locating and removing pieces of shrapnel comes only with experience. The wound is excised down to the deep fascia, and the point of penetration here is easily recognized. This is excised, and a finger is now gently insinuated into the track, and the latter is followed down as far as the finger will go. If the shrapnel is still not reached, a second incision is made on to the finger-tip; the finger is withdrawn from the track, reinserted through the new opening, and the track again followed up. This procedure is repeated, if necessary, until eventually the shrapnel is felt, when it is removed with a pair of forceps. It is necessary to stress the need for the utmost gentleness. "False passages" in the muscles are humiliatingly easy to make, and once one gets outside the original track it is well-nigh impossible to get back. By this means it is possible to trace a missile all the way up from the knee to the thigh with the minimum of tissue disturbance. In point of fact I have vivid memories of watching my ex-chief (who was an Army surgeon in the war of 1914-18) doing so, and producing a piece of metal the size of a golf ball from beneath the upper end of the adductor magnus—the entrance wound being in the region of the knee. No mention has been made of radiological localization. It was not found practicable to radiograph more than some 5% of cases. The time factor, and also sheer weight of numbers, precluded the use of this aid except where considered essential.

5. Toilet having been completed, the wound has a guttered appearance, being almost as wide in its depths as on the surface. Large bleeding-points are tied off, but all others are left, the aim being to reduce to an absolute minimum the foreign material (in this case catgut) in the wound.

6. Finally, the wound is well smeared with "zisp" and then packed with gauze impregnated with the same material. The bone ends, if severed, are manipulated into position, and the limb is immobilized in plaster-of-Paris. Primary suture of the wound is virtually never performed.

"Zisp" calls for some explanation. Its formula is:

Zinc peroxide
Iodoform
Sulphanilamide powder } equal parts
Paraffin, q.s. to make a thin paste.

The mechanical action is similar to that of the petroleum-jelly gauze in the Winnett Orr treatment, but there would appear to be several decided advantages. The emulsion is a deodorant. Thus there is none of the fetid odour which emanates from the patient subject to the Winnett Orr method, and it is possible to retain the plaster for as long as desired. The zinc peroxide liberates oxygen, and so retards the growth of anaerobic organisms. The inclusion of the sulphanilamide needs no comment. In spite of foreign views to the contrary, most surgeons agree that it plays a large part in keeping wounds aseptic.

Post-operative Treatment

This is virtually the same as originally recommended by Winnett Orr, except that it is not necessary to change the plaster because of the smell. One is guided by the general condition, by the pulse and the temperature, and by the local condition as evidenced by pain. Usually the temperature and pulse are normal, and the patient is comfortable within two days. Persistent pain and a rapid pulse are each an indication *par excellence* for removal of the plaster and inspection of the wound.

A final word about the late management of the wound. Frequently it does very well for a time, and then inexplicably hangs fire. It is at this stage that small doses of insulin may work miracles. Five units night and morning suffices.

Question of Gas Gangrene

I have had the misfortune to see eleven cases of gas gangrene since the war began. Clinically these can best be divided into two groups, although in all cases the causative organisms were discovered.

Mild Cases

These usually occur in wounds which have been subjected to inadequate toilet and to primary suture. The patient is moderately toxic, with a temperature around 102° and a pulse rate around 120. The suture line is obviously under tension, and the wound is resonant to percussion. On removal of the sutures a thin dirty brown fluid, teeming with anaerobic Clostridia, seeps out. In this type a 100% cure can be expected from a combination of relief of tension, deep therapy, and chemotherapy. Ablation is never required.

Severe Cases

Here the clinical picture is a different one. The patient is acutely ill and highly toxic. The temperature is not high, but the pulse is rapid and thready. The mental state is a characteristic one, the patient being hyperalert, and probably asserting that he had never felt better. Locally the limb has a tense drum-like appearance and characteristic odour. The skin has a mottled marbled appearance with typical venous marking. The arteries are not palpable. This is a true gangrene and the blood supply is occluded, though whether this latter be cause or effect is problematical. It spreads almost as one watches it, and surgery should be considered both urgent and imperative. Local intervention is meddlesome, and in immediate ablation lies the only hope.

At operation the limb is removed by a transverse incision, but the bone is divided as high above the skin level as possible. No attempt is made to get above the upper limit of infection, if necessary one being quite satisfied to go through the typical greyish mushy muscle. Haemorrhage is scanty, and only the main vessels are tied off. The wound is then packed with acriflavine in paraffin gauze, and the pack is held in position by three or four skin sutures

Post-operative treatment consists in a combination of intensive chemotherapy with sulphapyridine, deep therapy, venoclysis of glucose in saline, and anti-gas-gangrene serum. Three of the four cases of this type that I was associated with recovered on this regime. Four days later the skin sutures are divided and the pack removed. The wound now presents an amazing appearance. It literally looks as if it has just been made. This is because the acriflavine retards the formation of granulation tissue. Under local anaesthesia secondary suture is performed just as though it were a fresh wound, and healing virtually occurs by first intention. This method of performing the amputation is as fast as the true guillotine operation and has none of its disadvantages.

My thanks are due to Mr. H. John Nightingale, senior surgeon to the Royal South Hants Hospital, who is responsible both for my interest in traumatic surgery and for teaching me its principles and practice.

The annual general meeting of the Royal Medical Benevolent Fund was held at the house of the Royal Society of Medicine on May 14, when Sir Thomas Barlow, Bt., was re-elected President, Dr. Lewis G. Glover Honorary Treasurer, and Mr. R. M. Handfield-Jones Honorary Secretary. The accounts for the year ended December 31, 1940, were presented and adopted for circulation to subscribers.

LIVER RATIONS: SENSITIVITY TO MARGARINE

The following two statements, one on Rations of Fresh Liver for Cases of Pernicious Anaemia, and the other on Sensitivity to Margarine, have been received for publication from the Medical Research Council.

FRESH LIVER FOR PERNICIOUS ANAEMIA

Owing to the present shortage of supplies of raw liver the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council were asked by the Ministry of Food to advise as to the necessity for providing special rations of fresh liver for the treatment of pernicious anaemia. The committee advised that fresh liver was not necessary for the treatment of cases of pernicious anaemia, save for those rare patients in whom it was proved that parenteral injection of liver extract caused anaphylactic shock. The Ministry of Food have accordingly made no provision for allowing extra rations of fresh liver to cases of pernicious anaemia in general, but have arranged that, on the production of a medical certificate giving adequate proof that liver extracts administered parenterally give rise to anaphylactic shock, such rations may be available for particular patients. Applications for rations of raw liver on this special ground should be supported by full medical evidence and should be sent to Prof. J. C. Drummond, Ministry of Food, Neville House, Page Street, London, S.W.1, for submission to the Ministry's medical advisers. The advice of the committee was based on the following considerations: treatment of pernicious anaemia by means of parenteral injection of suitable liver extracts is, in practice, more efficient than treatment by ingestion of raw or lightly cooked liver; treatment by injecting liver extracts is the cheapest way of treating pernicious anaemia; the continued supply of fresh liver cannot be guaranteed under present circumstances, while liver extracts, by reason of their keeping properties, are likely to continue available.

Resistance to Injection of Liver Extract

It is now well recognized that the treatment of a case of pernicious anaemia cannot be considered satisfactory unless it succeeds in maintaining the red blood cell count at a figure of 5,000,000 or more per c.mm. and the haemoglobin concentration at a figure of 100% (Haldane) or more. If these figures are allowed to remain at lower values, then the patient, although perhaps feeling in good health, is exposed to the danger of developing subacute combined degeneration of the cord. While it is perfectly possible to raise and to maintain the red blood corpuscles and the haemoglobin percentage at these necessary values by the ingestion of fresh liver the amounts that it is required to ingest to do so are such that few patients continue to take them, as they should, indefinitely. With suitable liver extracts, on the other hand, the necessary criteria of successful treatment may be maintained, once the necessary levels have been attained, by the intramuscular injection of 1 c.cm. or 2 c.cm. of a suitable liver extract at intervals which are seldom less than two weeks. Despite the manifest advantages of the treatment by injections, however, objection has been raised to it on the ground that certain patients, while reacting satisfactorily to treatment by ingestion of liver, are resistant to treatment by injection of liver extracts. Assuming that the diagnosis of pernicious anaemia is correct, there are two reasons why such an impression may be gained. First, there are available on the market at present certain highly concentrated liver extracts which may not be efficacious in certain cases of pernicious anaemia which react well to ingestion of fresh liver. In such cases, however, it has been found that a satisfactory result is obtained when less concentrated, and incidentally cheaper, liver extracts are used. Second, it is not infrequently found that the initial expected improvement with treatment of a previously untreated case of pernicious anaemia is delayed, and this is especially so in cases complicated by sepsis or an infection or with arteriosclerosis. If in such cases treatment is commenced by injection of liver extracts and then, when the expected improvement does not speedily appear, the treatment is changed to ingestion of fresh liver with apparent speedy improvement the impression may thereby be gained that the patient is resistant to treatment by parenteral injection of liver extract. Actually this apparent resistance would, in such a case, be simply a manifestation of a delayed reaction to treatment, and if the treatments had been given in the reverse order the opposite impression would have been obtained. So convinced are the members of the Food Rationing (Special Diets) Advisory Committee that these are the usual explanations of the alleged resistance of true cases of pernicious anaemia to parenteral injection of liver extracts that they have agreed to test any case of pernicious anaemia in which the medical practitioner is convinced that such is not the explanation of why a particular patient reacts to ingestion of fresh liver while proving resistant to injection of liver extracts. Application for such a test to be made, accompanied by full medical data, should be sent to Prof. J. C. Drummond, Ministry of Food, Neville House, Page Street, S.W.1.

The above considerations apply to true cases of pernicious anaemia. A blood picture similar to that of pernicious anaemia may occasionally occur in other conditions and liver may have no effect in these cases. These cases are of two main types: cases with extensive disease of the bone marrow usually of malignant origin; cases in which by reason of advanced disease of the alimentary tract, such as sprue, short circuits, etc., there is marked failure of intestinal absorption and signs of deficiency diseases are present. For the former cases little can be done; for the latter, successful treatment of the underlying intestinal condition and of any deficiency diseases present may result in the patient becoming responsive to liver therapy.

Economic Considerations

It will be noted that the committee do not advise that patients should use either the liquid or powder preparations of liver designed for oral administration. Their reason for not doing so is that these preparations though undoubtedly efficacious, are uneconomical of the supply of raw liver available. It has been estimated that about fifty times as much raw liver is required for the manufacture of a single dose of a particular oral preparation as is required for manufacturing an equivalent dose of a preparation for parenteral injection. Under the present circumstances the use of oral preparations is, therefore, to be deprecated. The same objection does not apply to the use of oral preparations made from the stomach.

The erroneous impression that treatment by ingestion of fresh liver is cheaper than treatment by injection of liver extract should be corrected by comparing the daily cost to the treated patient of the amount of raw liver it is necessary for him to ingest to maintain his haemoglobin and red blood cell concentrations at the required value with the daily cost to him of an injection of liver extract, costing about one shilling, at intervals of one week or more. It will be seen that the cheapest way of treating a case of pernicious anaemia is by means of injections of suitable extracts of liver.

SENSITIVITY TO MARGARINE

Reduction in the amount of butter available has necessitated rationing regulations by which a varying proportion of the fat ration is made up of margarine. The result is that many persons, who in peacetime never ate margarine now find that this substance is their main source of fat. Since the inception of butter rationing the Ministry of Food have received many requests for special rations of butter from persons who allege that they are unable to take margarine because it provokes in them untoward symptoms. The Ministry of Food have therefore requested the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council to advise them on how to deal with such applications. The committee have carefully considered the evidence regarding sensitivity to margarine, and they have come to the conclusion that, if true sensitivity to margarine exists, it must be a very rare condition.

True and Apparent Sensitivity

In reaching this conclusion the committee were careful to distinguish between true and apparent sensitivity to a food. In true sensitivity the untoward symptoms are provoked whenever the food is taken, even though the quantity ingested is small and even when the offending food is so disguised by its method of preparation that the patient is unaware that she is partaking of it. Apparent sensitivity, on the other hand, is distinguished by the fact that the particular symptoms are provoked only when the patient believes that she is partaking of the particular food; they do not appear when the patient is unaware that she is consuming the article to which she is alleged to be sensitive, although they may appear when the patient, partaking of some other food, receives the impression

that she is actually consuming the offending article. Thus a patient with apparent sensitivity to margarine may retch and vomit after knowingly eating margarine, while she may consume without any untoward effect pastries containing a considerable proportion of margarine. A case of true sensitivity to margarine, if it exists, would be as sensitive to food prepared with margarine as to pure margarine. In this connexion the committee were made acquainted with the results of tests in which persons who were convinced of their ability to detect margarine were invited to partake of a large series of preparations, some consisting of or containing margarine, some consisting of or containing butter. The failure of candidates to distinguish accurately preparations of margarine from preparations of butter demonstrated that the alleged unpleasant properties of margarine, which these persons claimed to distinguish, existed only in the candidates' imagination and were dependent not on any property of margarine itself but on the candidates' prejudices with regard to this substance That the large majority, if not all, of the cases of alleged sensitivity to margarine now applying for special rations of butter are of a similar nature is suggested by a comparison of present experience with that of peacetime practice.

If true sensitivity to margarine actually exists to the extent that the application for special butter rations suggests, then it should be a condition with which all physicians are well acquainted and one which, because of the large consumption of margarine in peacetime, they should have met frequently before the introduction of the present rationing regulations. The lack of experience by physicians in peacetime of unequivocal cases of true sensitivity to margarine suggests that this condition is at least a clinical rarity, and, further, that the majority, if not all, of the persons now applying to the Ministry of Food for special butter rations on the grounds of sensitivity to margarine are in fact not cases of true sensitivity, but merely persons who have previously convinced themselves, erroneously but often quite sincerely, that they cannot take margarine. Nevertheless, medical knowledge on the question of sensitivity to margarine is not sufficiently complete for it to be stated dogmatically that cases of true sensitivity to margarine do not exist.

While therefore the committee are of the opinion that sensitivity to margarine in the vast majority, if not all, of the persons now applying for special butter rations is more apparent than real, they are not prepared to exclude the possibility that in some instances true sensitivity to margarine may exist. The committee have therefore arranged to test the sensitivity to margarine of any person in whom the medical data suggest the possibility of true sensitivity. Applications for the test, accompanied by full medical data, should be sent to Prof. J. C. Drummond, Ministry of Food, Neville House, Page Street, S.W.1, for submission to the Ministry's medical advisers, who, if the medical data warrant it, will undertake to test the patient.

EMERGENCY AMPUTATIONS

M.R.C. WAR MEMORANDUM

The War Wounds Committee of the Medical Research Council has issued M.R.C. War Memorandum No. 5 on "Emergency Amputations" (H.M. Stationery Office, 2d. net). It has been prepared by the Subcommittee on Amputations, consisting of Mr. H. A. T. Fairbank, Surgeon Rear-Admiral G. Gordon-Taylor, Colonel C. Max Page, Mr. P. Jenner Verrall, and Mr. R. Watson-Jones. The following is a summary of the principal points.

The memorandum begins by pointing out that in the treatment of wounds and combined fractures amputation is seldom needed except where injuries are grave and multiple or the main blood vessels of a limb are destroyed. In multiple injury due regard must be paid to the effects of concomitant lesions in deciding whether a damaged limb may be preserved. Where the injury is confined to one limb the main indication for amputation is irreparable interference with the blood supply. A surgeon who amputates because of the severity of the local injury assumes a grave responsibility, and a second expert opinion should always be sought.

Immediate Amputation

The type of amputation suited to a particular case depends upon the time which has elapsed since injury, the level at which amputation is indicated, and the general condition of the patient. It is occasionally necessary to amputate without delay, as in the case of a person pinned down by a weight of masonry; but whenever conditions permit, amputation should be deferred for an hour or two while wound shock is treated. Occasionally, where gross injury to a limb is associated with fracture, an immediate amputation at the level of the wound is the procedure of choice. In some cases it may merely be necessary to sever a few remaining strands of soft parts and excise portions of badly lacerated muscle. Where the local destruction has been less severe the operation will amount to a guillotine operation at the site of injury, save that no further bone section is made. This will conserve maximum bone, but is likely to entail a secondary formal amputation later.

Ordinarily the first six or eight hours after injury may be regarded as a safe period, with a reasonable prospect of first-intention healing of an amputation stump. Principles of treatment comprise excision of devitalized contaminated tissues and primary skin suture. A formal flap operation is performed at the site of election* and the skin flaps sutured in the usual manner. If the time-lag is somewhat greater than six or eight hours, and the wound is near the site of election, or if early evacuation of the patient seems probable, a flap amputation with delayed primary skin suture should be performed. Mattress sutures are inserted in the margins of the flaps, but not tied, and protected from coming out by strips of rubber tubing or buttons, so that light traction may be applied. The traction is discontinued after from two to ten days, if there is no active infection, and the sutures are then tied.

Late Amputation

Indications for late amputation are gangrene due to vascular thrombosis, massive gas gangrene, and danger to life from spreading infection or severe secondary haemorrhage. If more than twenty-four hours have elapsed since injury, flap amputation with primary skin suture is unsafe and may be dangerous. The following are the alternatives:

(1) When primary amputation can be performed well below the site of election—

(*a*) A guillotine or circular flapless amputation at a low level;

(*b*) Flap amputation with the flaps left open or only loosely approximated to cover the raw area. (After each of these forms of primary amputation, a formal flap amputation at the site of election may be carried out when infection and oedema have subsided.)

(2) When the amputation must be at or close above the site of election—

(*a*) If there is viable skin below the amputation level, flap amputation with traction and secondary suture of the skin flaps;

(*b*) If no viable skin below that level, guillotine amputation with continued skin traction until the wound is healed, no other amputation being performed.

In a circular amputation the skin is divided at one level, the muscles at a higher level, and the bone at a still higher. A guillotine amputation is strictly one in which skin, muscles, and bone are divided in the same plane, although the experienced surgeon usually retracts each layer slightly before dividing the next. The purposes of such amputation are to save life in severe infections by removing a limb rapidly, leaving the smallest possible and most easily drained wound and enabling a clean amputation to be done later at the site of election, and to conserve length of stump when skin has been extensively destroyed.

Complications of Guillotine Amputation

Certain precautions are necessary to avoid serious sequelae of guillotine amputation. At whatever level the original

* The site of election for the various amputations is as follows (the minima are given in brackets): Leg, 5½ in. below knee-joint (3 in.). Thigh, 10 in. below top of trochanter (6 in.). Forearm, 7 in. below tip of olecranon (4 in.). Upper arm, 8 in. below acromion (5 in.).

guillotine has been performed, any reamputation must involve division of bone at a higher level. If the guillotine was performed well below the site of election, this is not a disadvantage, but if at or above the site, reamputation at a higher level gives a stump unduly short and possibly useless. If no skin traction is applied, skin and muscle retract, producing a conical stump, with projecting bare bone, and the whole cone must be removed at reamputation, so that the final stump may be far too short. The complication may be avoided by applying skin traction within twenty-four to forty-eight hours of the first amputation. Four strips of adhesive strapping are applied to the skin, the adhesive reaching as near the margin of the wound as possible, and secured by encircling turns of strapping. To each of the strips is attached a cord, leading to a weight suspended over a pulley at the foot of the bed or, if the patient must be evacuated, a Thomas splint may be used, to the lower end of which the four cords are fastened, the ring being pressed up against the tuber ischii. Detailed drawings of these applications are included in the memorandum.

If the raw granulating surface is repeatedly dressed the patient suffers severe pain, with fluid loss and danger of secondary haemorrhage. This can be avoided by using the "infrequent dressings technique" (as in the Winnett Orr and Trueta treatment of infected wounds). To minimize the risk of secondary haemorrhage in high guillotine amputation of the thigh, it is advisable to ligate the femoral artery in its continuity just below Poupart's ligament at the time of the amputation. If reamputation be performed too soon, healing will not be by first intention, and a second amputation may be necessary, with further shortening of the stump. This can be avoided by deferring reamputation not only until the granulating surface is clean, but until all oedema has disappeared.

Indications for guillotine are as follows: (1) cases reaching the surgeon in such a desperate condition that only an operation performed with this speed and simplicity holds out promise of recovery; (2) cases of persons caught by a limb in machinery or held down by masonry; (3) cases of severe infection or gangrene where the section of the limb can be placed at a low enough level to permit subsequent reamputation at the site of election; (4) cases needing amputation at the site of election or close above it where no skin is available below that level and it is proposed that the guillotine shall be the final amputation.

A flap amputation cannot be performed quite as quickly as a guillotine, and the area of exposed tissue is greater; but there are circumstances in which this operation is preferable. If the site of amputation is determined by the destruction and infection of muscles, the skin below this level being viable, and if the level is at or above the site of election, generous skin flaps should always be cut, the muscle and bone divided at the higher level, and mattress sutures inserted in the skin flaps for continuous traction.

GLASS SUBSTITUTES AND PROTECTION FROM FLYING GLASS

The vast number of casualties, most of them minor but some major, caused by broken glass, prompted an exhibition of the materials now available as substitutes for window glass and the means of protection from glass splinters. This was housed at the Building Centre, New Bond Street, London, and was designed to illustrate the methods of carrying out the recommendations of the Ministry of Home Security as embodied in a memorandum published by its Research and Experiments Branch. A wide range of materials was on view, the larger number of them being some form of textile netting or of cellulose film. The substitutes for glass vary in price from 1s. 6d. to 10s. a square yard; they are weatherproof and capable of being fixed to the metal frames of windows with a special composition. They include netting impregnated with a gelatin-like material, cotton backed with a rubber solution, a kind of bakelite which has the appearance of corrugated iron, wire buried in cellophane, and a material called "dufayglass," which is a cellulose acetate film reinforced with cotton net. To prevent glass from scattering there are various kinds of net to be affixed to glass by wetting and pressure, blinds of black cloth with rubber backing, and wired glass and glass bricks which have been found to withstand severe fire tests and even to retard fire. These bricks form an architectural feature, give a considerable diffusion of light, and, illuminated, might be used to indicate the position of shelters. One of the complications of window protection is that the blast wave has a kind of "S" form, and may cause the glass of the window to fall either outwards or inwards, according to the phase which is in operation at a particular spot. To ensure more complete protection panes should be treated on both sides, which means a further heavy diminution in transparency. The exhibition also showed how the science of ventilation is adapting itself to black-out conditions. Intake ventilators were shown which can be fixed to glass, wood, or metal. One special contrivance fixed to a window frame permits the window to be partially open during black-out. There are ingenious vents in the pelmet and cowls arranged in such a way as to provide the maximum of ventilation while observing the lighting regulations. If the ideas find wide adoption the third war winter should see the problem of interior stuffiness solved.

Local News

ENGLAND AND WALES

London School of Hygiene and Tropical Medicine

A report on the work of the London School of Hygiene and Tropical Medicine, which incorporates the Ross Institute, has been made for the year 1939-40. Since the end of the period covered by the report Sir Wilson Jameson has resigned his post as dean on his appointment as Chief Medical Officer of the Ministry of Health, and Lieut.-Colonel G. S. Parkinson has been appointed dean for the duration of the war. The war has seriously affected the work of the school, but programmes of research have been carried out as well as a limited amount of teaching, and short intensive courses have been given for persons about to undertake service in the Tropics. The department of clinical tropical medicine suffered a serious blow when the Hospital for Tropical Diseases was closed on the outbreak of war, but as a temporary measure ten beds were allocated at the Dreadnought Hospital, Greenwich, for cases of the type which previously had been admitted to Gordon Street. The Dreadnought itself has since been damaged, so that other provision for the teaching of clinical medicine has had to be made. The department of parasitology has been transferred to St. Albans, where an investigation on subclinical helminthiasis in Great Britain has been continued, as well as other studies. Investigations on lice have occupied the department of entomology, and the use of modern insecticides in controlling lice has been carefully examined. In the department of epidemiology and vital statistics a great deal of statistical work relating to air-raid casualties has been undertaken. In the public health department the behaviour of the skin, especially in relation to the effects of clothing, has been one of the subjects of study, and workers in this department have also assisted in the Medical Research Council's extensive investigation of pulmonary disease among anthracite miners in South Wales. A certain amount of teaching has been given in the department of medical industrial psychology, especially for medical men taking up work in industry, and for industrial nurses. The Ross Institute has also maintained its activities very well throughout the year in spite of great difficulties. In the earlier part of the year the director of the Institute, Sir Malcolm Watson, visited India and West Africa, and, among other matters, made an extensive study of malarial control work. A list is given in the report of nearly one hundred papers which members of the staff of the school and of the Ross Institute have contributed to scientific journals. The accounts show a substantial surplus on the year's working, thanks largely to the generous aid of industrial concerns with interests in tropical countries.

Liverpool Psychiatric Clinic

That the war has made little difference to the activities of the Liverpool Psychiatric Clinic is revealed in the report presented to the recent annual meeting. The clinic has now, however, no paid medical personnel, and were it not for the devoted services of its five honorary physicians it would have to close down. The report states that "psychologically speak-

ing, enemy action upon Merseyside has had little direct result." A few cases have been dealt with of civil defence and armament workers subjected to prolonged and excessive stress, but it had been anticipated that concentrated aerial bombardment or even the threat of air raids might cause numerous cases of alarm, distress, or even panic. An intensive course of instruction has been given to selected volunteers to fit them as auxiliary mental health workers in such circumstances, and eighteen workers were prepared in Liverpool and warned for service, but so far—the report takes the story to the end of 1940—none of them has been required in that capacity. The new patients attending the clinic in 1940 numbered 261 and the attendances 1,710. At the same meeting Mr. D. W. Harding, senior lecturer on psychology at the University, gave an address on mental health in post-war reconstruction.

Correspondence

Obscure Nervous Effects of Air Raids

SIR,—I read with interest and can endorse Mr. Tom Harrisson's excellent clinical observations (April 12, p. 573). These are, however, not limited to air-raid casualties, as similar cases occur as sequelae to a variety of conditions, notably influenza; from a medical point of view their symptoms are mental and not neurological. Dr. Clifford Allen (May 10, p. 727) also emphasizes the frequent occurrence of mild cases of stupor, and his "reflex reaction" is reminiscent of the behaviour of patients who endure a minor operation, then collapse a minute or so *after* the last bandage is in position.

My experience of the pathology of air-raid casualties is so far very limited; ideal material for histological examination is of course unobtainable, since death itself is a more advanced state than concussion. I have, however, come to the conclusion that the pathology of both immediate and remote effects is essentially vascular. One of my air-raid casualties had gross vascular lesions in the brain stem and at the large nerve roots (optic chiasma)—obviously due to severe tissue stretching along the spinal axis. Another casualty did not show such localization, but had a fractured lumbar spine. The brains from these cases and from some intracranial pressure experiments on animals all showed defective staining with the benzidine technique. This defect I attribute to a tissue acidity from anoxia, which arises when the vascular network is deformed, since the stretching acts as a mechanical irritant in causing capillary constriction. Neurone function is not affected by this stretch. I have recently shown that conduction in the frog's nerve is unimpaired by severe stretching even up to the moment of rupture of its muscle attachments.

When the tissues about the posterior hypothalamus are stretched (with resulting capillary constriction) unconsciousness results (Bailey); and it is logical to conclude that if the return of consciousness is delayed, partial, or associated with mental changes, many such constricted capillaries have failed to reopen properly. An effective blast wave has a pressure of from twice to a hundred times that of normal blood pressure, so that not only deformations of tissue with stretching and capillary constriction occur but also undue and partially irrecoverable distension of larger cerebral vessels are histologically demonstrable (for example, rupture of the elastic or muscle coat of the arteries; rupture, dilatation, and stasis in the veins).

Depending upon the extent and locality of these combined lesions and their vascular sequelae, labile sensori-motor associations are disturbed, resulting in abnormal behaviour which sometimes resembles that of post-lethargic encephalitis as noted by Dr. H. Crichton-Miller (April 26, p. 647). I have no doubt that such pathology would be enhanced and maintained by chronic nasal sinusitis in a manner similar to that by which such toxi-infective conditions produce cerebral vascular lesions in mental disorder cases.—I am, etc.,

Birmingham, May 15. F. A. PICKWORTH.

SIR,—In his letter (May 10, p. 727) Dr. Clifford Allen has suggested that concussion can be caused by blast, and that damage to the cribriform plate and nasal sinuses may occur sufficient to allow spread of infection to the meninges. This latter suggestion is very important, but I cannot agree with the former. Investigations on the effects of blast on the central nervous system have been pursued at the same time as the other studies on the effects of blast carried out for the Research and Experiments Department of the Ministry of Home Security under the direction of Professor S. Zuckerman. We have never seen any signs of unconsciousness in any of our surviving animals even within 10 seconds of exposure. A monkey which had suffered lung damage which caused death from pulmonary oedema in two hours was immediately capable of co-ordinated activity. Some of our animals have shown signs of fright and have refused to feed for a few hours after exposure, but their behaviour has been otherwise normal. On the other hand, there is no doubt that a recognizable picture of concussion can be produced in animals by impact.

The results of a specially conducted survey of air-raid casualties have shown that concussion does not occur apart from the impact of the skull with a solid object. A feeling of being "dazed" is common, but this, without retrograde amnesia and without a period of unconsciousness, does not constitute concussion.

Blast, in fact, does not "act like a solid body." Where it encounters an air space in which the pressure cannot change as rapidly as the pressure outside it, the walls of the air space will be distorted and may break. This is equally true of the windows of a room and of the tympanic membrane as a wall of the middle ear. We have suspected that it may also be true of the nasal sinuses and air passages, to which pressure may be transmitted by the relatively inconipressible tissues of the head. Thus damage to the cribriform plate might occur without the impact of a solid body. The existence and importance of this effect are under investigation, and we are indebted to Dr. Clifford Allen for his suggestion of its clinical importance.—I am, etc.,

University Laboratory of Physiology, Oxford, May 13. D. WHITTERIDGE.

Renal Complications of Sulphapyridine

SIR,—We had a similar case in 1940 to those mentioned by Major F. R. Fletcher (February 15, p. 242), Mr. J. C. Leedham-Green (April 19, p. 586), and Dr. J. Rowland Hughes (May 10, p. 730). A man aged 44 developed acute influenzal pneumonia. In three days he received 12 grammes of sulphapyridine, and was much better on the evening of the third day. At 8 a.m. on the fourth day he developed violent pains in both loins, passed two ounces of blood-stained urine, and then had complete anuria. This lasted for twenty-four hours. He was to be admitted to hospital, when we gave him 40 grains of potassium citrate orally. Two hours later he passed 40 ounces of blood-stained urine, and from that time his kidneys functioned quite normally. Unfortunately ten days later he developed an empyema and had to have a rib resection but after a stormy convalescence he made a good recovery. It might be worth while to use potassium citrate orally before trying intravenous medication in such cases.—We are, etc.,

JAMES HANNAN, M.B., Ch.B.
HAMILTON F. MOFFIT, L.R.C.P.&S.I.

Aberdare, May 14.

Tuberculosis in the Army

SIR,—In a communication in the *Journal* of March 22 (p. 441) Major G. D. Kersley, discussing pulmonary tuberculosis in soldiers, makes the following statement: "Cooper (1940) says that 5% of recruits to the 6th Division of the A.I.F. were turned down by medical boards on account of phthisis and that another 0.9% were later discovered by microradiography, of which over half appeared to be active." This suggestion—that of every twenty Australian men of military age one should be suffering from phthisis, diagnosable by medical boards presumably not using mass radiography—appeared to me to be so remarkable that I looked up once more Cooper's excellent paper (*Journal*, August 24, 1940, p. 245), abstracted in the *Bulletin of War Medicine*, January, 1941, p. 179. I could find no confirmation of the figures given by Major Kersley, since Cooper claims that 0.55% of the men were found by microradiography to have active tuberculosis; he does not say how many recruits were found to be tuberculous by the medical boards. The figures given by Major Kersley suggest that far more cases of tuberculosis are detected by clinical examination than by microradiography, whereas precisely the opposite impression is given by Cooper's

VITAMIN THERAPY

THE VITAMIN B COMPLEX

In the early days of vitamin research the complexity of vitamin B was not fully appreciated, but advances in nutritional knowledge have since differentiated the various factors of the B complex and new methods of assay have provided reliable quantitative data.

EFFECT OF VARIOUS FACTORS

Biological experiments with adermin (vitamin B_6) have proved its usefulness in various syndromes. Improvement has been recorded in certain cases of idiopathic epilepsy, in amyotrophic lateral sclerosis, and in hypertrophic muscular dystrophy. Decreased stiffness and rigidity have followed its use in non-postencephalitic parkinsonism.

The particular deficiency symptoms which have responded to vitamin B_6 administration are extreme nervousness, insomnia, irritability, cramping abdominal pain, muscular weakness and rigidity with difficulty in walking.

Clinical grounds for considering the administration of other factors of the B complex may be classified as follows:—

Established or conditioned deficiency of vitamin B_1 (aneurin)

Beri beri.	Lactation.
Alcoholic neuritis.	All restricted diets, especially those for gastric and duodenal ulcers, colitis and diabetes.
Pregnancy, especially with polyneuritic symptoms.	Rheumatoid arthritis (B.M.A. Committee's Rep. Section IX e).
All conditions with a raised metabolic rate, e.g. pyrexias, hyperthyroidism.	Poor appetite, especially in children.
Cardiac decompensation.	

The conjunction of such a large number of apparently unrelated clinical conditions is less surprising when it is remembered that vitamin B_1 is known to be essential for normal carbohydrate oxidation in the tissues. Similar considerations may also apply to other constituents of the B_2 complex such as riboflavin and nicotinic acid.

Established or probable deficiency of riboflavin or nicotinic acid

Roughening of the skin bordering nose and mouth (riboflavin).	Pellagra and other conditions with porphyrinuria (nicotinic acid).

From the point of view of ease of treatment it is indeed fortunate that this wide range of vitamins is found occurring in one substance to the extent shown in the table.

	% of daily requirement supplied by 1 oz. Bemax
VITAMIN B_1 (aneurin)	60
VITAMIN B_2 (riboflavin)	45
P.P. factor (nicotinic acid)	22
VITAMIN B_6 (adermin)	probably 100
VITAMIN E (*a*-tocopherol)	100+
IRON (available)	25
COPPER	25

A distinction must be drawn between the use of Bemax as a dietary supplement and its use as a therapeutic agent. In the former case ½ oz. daily is normally sufficient. In the latter, dosages between 2 and 4 oz. may be used and will furnish, inexpensively, very substantial amounts of the various factors of the B complex. The fact that 1 oz. of Bemax will, in addition, supply 10 grammes of *first-class* protein is of especial importance under war-time conditions.

Clinical sample of Bemax and literature on application to: Vitamins Ltd. (Dept. BN), 23, Upper Mall, London, W.6.

VITAMIN E (*a*-tocopherol)

The use of wheat germ oil in the treatment of cases of sterility and habitual abortion of dietary origin is the result of research extending from 1920 until the present day.

The treatment, according to published reports, has been successful in about 70 per cent. of cases. The classical experiments were all carried out using *whole* wheat germ oil.

Wheat germ oil is now also being increasingly used for cases of primary muscular dystrophy, amyotrophic lateral sclerosis, after poliomyelitis and in rarer cases such as amyotonia congenita.

Indications are that natural sources of vitamin E, such as Fertilol and Bemax, are more effective clinically than synthetic products, possibly because other vitamins present in them may enhance the activity of vitamin E. Whole wheat germ oil has been available since 1934 as Fertilol, which is a highly active *natural and stable* source of vitamin E, plus the other naturally occurring factors of wheat germ oil. Complimentary box on request.

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paper and by a large mass of other recent work on the subject. It seems, therefore, to be of some importance to raise the point.—I am, etc.,

CHARLES WILCOCKS,
Assistant Director, Bureau of Hygiene
London, W.C.1, May 14. and Tropical Diseases.

Physical Medicine, Orthopaedics, and Rehabilitation

SIR,—In an annotation (April 26, p. 633) you claim that the poor results of massage, ultra-violet light, short-wave, and other electrical currents could have been avoided by physical medicine experts, because in such hands these measures "might never have been employed in that way." The meaning of this observation is obscure, but surely it is well known that all such passive treatment failed because it was elevated to a status of false importance, so that patients were deluded into believing that they need only sit back and be cured. Inertia was induced, indolence was promoted, and finally the will to recover was lost. Your suggestion that consultants are needed for "the expert prescription of massage" because otherwise practitioners leave the choice of method to the "trained—but not medically trained—technician," is no more convincing than would be the suggestion that consultants are needed for the expert prevention of bed-sores, in order not to leave treatment to the trained—but not medically trained—nurse. You say that physical medicine consultants are required because "orthopaedic surgeons have inadequate knowledge of the various means employed in physical medicine." About two-thirds of the time of an orthopaedic surgeon is engaged in methods of physical medicine, and we do not know upon what grounds you suggest that his knowledge is inadequate. But assuming that the criticism is justified, is the remedy correct? You may have similar grounds for charging urological surgeons with inadequate knowledge of cystoscopy, and neurologists with inadequate knowledge of spinal puncture. Would you therefore create consultants in cystoscopic apparatus and consultants in lumbar puncture? Finally, and most dangerously, you make the astonishing observation—"Orthopaedic surgeons have been heard to claim that they are capable of seeing their cases through from beginning to end." How short a time since you yourself fought to achieve that very object! In pleading for the organization of orthopaedic and fracture services you insisted that there must be "continuity of treatment" and "unity of control." The British Medical Association, in one of its most successful reports, deplored the system by which surgeons treated their cases to a certain point and then handed them on to masseuses and physiotherapists, so that surgeons knew nothing of the end and physiotherapists knew nothing of the beginning. Under no circumstances must the orthopaedic surgeon "be freed from anxieties about the final stages of treatment." It was exactly this freedom from anxiety which accounted for the deplorable results of fracture treatment in former days.

These are not the arguments by which to support the survival of physical medicine. Physical medicine will survive, but not as we knew it in the past. It is a part of orthopaedic treatment which begins on the first day that an injury is sustained, and continues throughout every phase of treatment. It is so closely bound up with other orthopaedic measures that it cannot be isolated and separated. Moreover, the blue lights and red lights, and the long waves and short waves, which loomed so prominently in the past, will be relegated to their proper place. Massage and heat will no longer be prescribed as a treatment, but simply as a prelude to the patient's own activity, which is the essential treatment. The future of physical medicine is assured when the physical medicine specialist concentrates on the patient rather than on the apparatus, and more particularly when he concentrates on the mentality of the patient and the psychological reactions which are hindering his physical recovery. A medical officer may well devote his attention to this non-operative aspect of orthopaedic surgery, and thereby earn the title of "orthopaedic physician." His training will be no less lengthy than that of his surgical colleague, his knowledge of bone and joint pathology no less profound, his ability in diagnosis, in manipulative technique, and in the use of plaster no less complete. He may have no gift of operative skill, but he will have the gift of a personality which encourages, stimulates, and inspires his patients. A few medical officers with this experience and ability are already at work in rehabilitation centres in the Services and in the E.M.S. We believe that they are the physical medicine experts or "orthopaedic physicians" of the future.—We are, etc.,

T. P. McMURRAY, Liverpool. R. STIRLING, Edinburgh.
H. J. SEDDON, Oxford. W. GISSANE, London.
R. WATSON-JONES, Liverpool. C. IRWIN, Newcastle.
H. O. CLARKE, Manchester. ERIC LLOYD, London.

President and Secretary of the British Orthopaedic Association, and Chairman and members of the Standing Committee on Fractures.

SIR,—Your annotation on "Physical Medicine, Orthopaedics, and the Services" contains so much which is ill informed and even prejudiced that it cannot be allowed to pass unchallenged. The scope of the practice of orthopaedic surgery was admirably defined by the late Sir Robert Jones for the guidance of his disciples in the early years after the war of 1914-18. The definition was as follows: "The treatment by manipulation, operation, re-education, and rehabilitation, of the injuries and diseases of the locomotor system." Though stated in terms relating primarily to therapeutics, this definition embodied the dual conception of orthopaedic surgery (1) as an integral part of surgery as a whole; and (2) as an independent clinical art and science *(orthopaedics)*, intimately related to the practice of preventive medicine and to the problems of physical education and industrial welfare. To this must be added that in his chosen field the orthopaedic surgeon, as a clinician, acts as a court of first instance, collaborating freely with other colleagues when collateral evidence is required for accurate diagnosis.

In his responsibility to the patient the orthopaedic surgeon's practice is based on the principle of *unity of control* throughout all phases of treatment to the final goal of maximum recovery of function. This principle has been widely accepted as one of the essential features of the modern organized fracture department (B.M.A. Fracture Commission, 1935: Interdepartmental Committee's Report, 1939).

Many, though not all, of the measures included under the term "physical medicine" are thus an integral part of the therapeutic armamentarium of the orthopaedic surgeon. Both in his private clinic and in his hospital service the orthopaedic surgeon chooses the type of physical treatment suitable for his patient, prescribes in detail to the trained masseuse who forms part of his team, and controls such treatment throughout. The writer of your annotation must realize that there will be no withdrawal from this position.

Space does not permit me here to trace the evolution of physical medicine, which in its early beginnings owed much to the practice and teaching of the orthopaedic surgeon of past generations. In Germany, even to-day, the orthopaedic surgeon could be better described by the term "orthopaedic physician," for his practice is founded on a combination of minor operative procedures, the extensive use of plaster, splints, and appliances, massage, mechanotherapy, and gymnastic exercises. At the present time there are in Great Britain, among the senior orthopaedic surgeons, a number who have had many years' experience in the direction of departments of physical medicine. I myself founded and directed for twenty years the department of physiotherapy and its associated school of massage at the Ancoats Hospital, Manchester. In the training of the younger orthopaedic surgeon we regard as essential a knowledge not only of the scope but of the practical details of physical treatment. It is thus quite absurd to suggest, as does your annotation, that "the orthopaedic surgeon has inadequate knowledge of the various means employed in physical medicine."

In asserting his right and competence to prescribe and direct physical treatment for his own patients the orthopaedic surgeon recognizes that there is a wide field of medicine, primarily the responsibility of the physician, in which physical methods of treatment play an important part. I need only quote as examples the rheumatic diseases and affections of the nervous system. In this field the general physician, if so disposed, is entitled to sublet his therapeutic rights to specialists in treatment—in my judgment a most unsatisfactory arrangement. But what has actually happened is that in the growth of specialism there has emerged a group of well-trained physicians—working mainly in spas—who, like the orthopaedic surgeons, have found it essential to prescribe and control such physical measures as in their judgment will benefit

their patients. Here we see, in general medicine, the true counterpart of the orthopaedic surgeon in general surgery. So far as I am aware, these specialist physicians have shown no great desire to be labelled simply as specialists in treatment, nor yet to adopt the new title of "orthopaedic physician." If I may venture to prophesy, they are likely to remain content to be known as physicians, consultant in status and responsible both for diagnosis and for treatment in all phases of the diseases which form their chosen field of practice. The orthopaedic physician of the future—if he takes shape in any great numbers, which I doubt—can only be drawn from the ranks of the fully trained orthopaedic surgeons. He will be an individual who for some well-founded reason has decided to relinquish the operative side of his work.—I am, etc.,

Manchester, May 13. HARRY PLATT.

SIR,—Your annotation prompts me to ask your indulgence to discuss a few points raised therein.

You state that one reason why the subject of physical medicine is little comprehended by the profession at large is that the methods used by those who specialize in it do not form a real part of the training of students. Whose is the fault? Certainly not those who practise physical medicine, for they have made persistent efforts to encourage training in physical medicine methods as part of the compulsory general training of students, and failed mainly because of opposition from the medical profession itself. Mainly due to this the gates of the field of quackery have been further opened. Moreover, the field of quackery is by no means confined to physical medicine, as the charge equally affects many medical methods such as vaccine and glandular therapy (see advertisements in daily newspapers). So long as the Law permits general stores to sell medical instruments such as infra-red and ultra-violet lamps with no control over their efficiency, and to advertise their supposed value in pseudo-scientific language which appeals to the public, there will always be quackery. Surely, however, it is unfair to blame those who practise physical medicine and have done all in their power against heavy odds, and with considerable success, to place this branch of medicine on a scientific basis.

Because of lack of compulsory teaching in physical medicine during their student days, general practitioners have no alternative but to depend on medical auxiliaries, and the fact that such highly trained personnel as the members of the Chartered Society and the Society of Physiotherapists exists has done much to aid general practitioners and to limit the use by the profession of those less qualified.

I submit that your statement that there has arisen some dissension between the specialist in physical medicine and the orthopaedic surgeon conveys an erroneous impression. That there may have been dissension between the two in individual cases is probable, as has happened many times before in other medical departments; but to imply that disagreement between the two branches is on such a scale as to hinder progress is a gross exaggeration and unfair to orthopaedic surgeons and physiotherapists alike. I know that the statement has been made, and I am equally aware that it is persistent and difficult to deny, but why I can never understand.

When I addressed a committee meeting at the House of Commons on "Physical Medicine in Wartime" the same charge was made by two of those present, and in spite of my categorical denial both were inclined to persist in their statement. Realizing the seriousness of this belief and to emphasize my denial I appealed to the chairman to support my contention that nothing I had said could be interpreted as meaning that advocates of physical medicine wished to divorce their specialty from orthopaedics. What I did point out was the fallacy that appeared to exist in some quarters—the Ministry of Health among others—that physical medicine is a corollary of all orthopaedic treatments and that only orthopaedic cases benefit by treatment on physical medicine lines, whereas in fact its field of operations covers more or less every branch of medicine. I further pointed out that a physical medicine organization could work in harmony with every medical and surgical unit to which a department is attached, and that all physiotherapists would, as always, loyally co-operate with their colleagues under whom they might be appointed to work. I still maintain that there is no conflict of ideas or actions between the two sections, and it would indeed be unworthy of either if such were so.

As a result of the present system—or perhaps it would be more accurate to say lack of system—much highly trained personnel has been lost, but the worst feature, and one that will certainly have serious repercussions after the war, is the fact that untrained personnel has been allowed to replace them in many instances. This will materially spoil the effective work that has been done by the Chartered Society and the Society of Physiotherapists in training medical auxiliaries, a work which has done so much to place their activities on a more scientific basis than formerly. The sure result will be that after the war many unqualified people will be treating patients with all kinds of apparatus and claiming special qualifications because of their "war work."

The special committee of the British Medical Association to which you refer did onerous and good work before the war and during its early days, but since the appointment of one of its members as Adviser in Physical Medicine to the Ministry of Health its activities have been successfully sterilized, and as an active body it has been practically ignored by the Ministry, chiefly as the result of the adviser having taken a line of his own in his recommendations to the Minister. I had several meetings with the Minister of Health, at which I endeavoured to persuade him to appoint a committee of experts in the various branches of physical medicine, not merely to advise but with power to act under his direction, so as to bring into being an active organization which would ensure the economic and efficient control of physical medicine in all its aspects. The various departments set up would still be in charge of Sector Physiotherapists, and they in their turn would be under the orders of the Group Officers. This committee would be under the chairmanship of a Ministry of Health official appointed by the Minister and would consist of the necessary secretarial staff and an agreed number of selected physiotherapists representing various branches of physical medicine, including those responsible for spa treatment. It was proposed that the committee should meet daily until the organization was complete and in full working order. Such a co-ordinating and controlling committee with power to act would, in the opinion of many of my colleagues, better enable physical medicine efficiently and economically to cope with the enormous work that lies ahead of it than is possible under the present conditions of local control. Such autonomy of *organization* would surely be a great advantage to all the staffs of hospitals, etc., where there are departments for physical medicine treatment.

The Minister was sympathetic and promised that if, after consultation with his advisers, he considered the scheme advisable, he would appoint a committee on these lines. The end-result, however, was the appointment of a purely advisory committee of busy doctors who can only meet at infrequent intervals, and have no power to see that their recommendations are carried out. In a leading article in a recent number of the *British Journal of Physical Medicine* the paucity of news about this committee was referred to, and it was stated that "unless there is a sudden and remarkable change in the situation we shall be forced to conclude that the committee is a failure."

That there is much dissatisfaction over the present position of physical medicine so far as the different Government organizations are concerned is certain; but it would appear to be almost hopeless to expect improvement mainly because many of those who are practising physical medicine to-day, although they give damning evidence of inefficiency in private, yet express reluctance to make any formal protest in an effort to get better conditions. In all my discussions with the Minister of Health this was an obstacle which it was practically impossible to surmount.—I am, etc.,

London, W.1, May 13. MORTON SMART.

Rehabilitation of the Injured

SIR,—I have read with interest Mr. E. A. Nicoll's article on "Rehabilitation of the Injured" (April 5, p. 501) and the subsequent correspondence about it. It occurs to me that there is a danger of confusing the issue by the wrong use of words. The increasing tendency to confine the meaning of "rehabilitation" within the narrowest limits is, I think, dangerous: in my view it is to miss the whole significance of the term. The ultimate objective of the accident-disabled must be, for his own sake and the nation's, economic rehabilitation—preferably, of course, by means of complete restoration of

function, but, failing that, then by whatever alternative method can be afforded him. A rehabilitation centre should therefore include the whole range of activities which may be necessary to enable the individual to resume his place in the labour market, either as an able-bodied man or on equal terms with the able-bodied. Occupational therapy, physiotherapy, controlled recreational activity, and technical training all have their place in the process, the various component parts of which are closely interdependent. It may be true, as one of your correspondents says, that no injured workman can be regarded as "recovered" until he can resume his original employment; but "rehabilitation" connotes much wider possibilities. For example, A. recovers completely from his injury and resumes his original employment. B. loses an arm, but, after being fitted with a specially designed attachment and given a short period of re-education, can also resume his employment. C., being unable to do this, is, after training, discharged to new employment, where he can earn more than in his original job. Can it be said that of these three only one has been rehabilitated? Direct contact between surgeon and patient and the knowledge that recovery will come by the man's own efforts are equally important for all cases. The rehabilitation centre must be closely associated on the one hand with the hospital when the injured man comes and on the other with the industrial field to which he is being fitted to return.

Experience shows that remedial work for patients capable of complete recovery and training for the permanently disabled can be carried on under one roof, with advantage to both categories for several reasons: the psychological effect is good on each side; the training workshops furnish excellent scope for the activities of the remedial department; and the various facilities provided in the latter are equally needed by the permanently disabled, prior to or concurrently with training.

Unfortunately the out-of-date theory that vocational training means long-term craft-training with employment at the end of it dependent on sheltered conditions or the philanthropic appeal still persists in many minds. Modern methods of short-term training for industrial employment have altered the whole position, as may be indicated by the fact that the Munitions Training Scheme of the Ministry of Labour and National Service now includes a Disabled Section.

A chain of rehabilitation centres throughout the country equipped to give the maximum opportunity to temporarily and permanently disabled workers alike is an urgent need. In this connexion we should do well to consider the American methods in two respects. In the United States the word "rehabilitation" covers all aspects of the economic restoration of the disabled, and one Government Department alone—the Federal Rehabilitation Board—is concerned.—I am, etc.,

Exeter, May 6. GEORGIANA BULLER.

The Mobile Unit and Early Care of Casualties

SIR,—Since I was medical officer in charge of a London mobile unit during most of the air attacks last autumn and winter, and in view of the heavy share of incidents occurring in this borough, my experiences and suggestions in the present discussion on mobile units and casualty treatment might be of value. Recently the unit has been transferred to the control of one of the local hospitals, and I have no official knowledge of its functioning since then.

Very early on I arrived at some broad conclusions. (1) Seldom, if ever, was it either possible or necessary to set up an improvised first-aid post as originally envisaged by the Ministry of Health. The extensive devastation destroyed previously allocated "setting-up" points, while the flooded streets and difficulty of screening lights rendered the original ideas valueless. (2) In common with other units we were either arriving late at incidents from which casualties had already been dispatched or were not called out to incidents requiring the services of a unit. (3) It was usually unnecessary to take out the whole unit on a first call, and a car with doctor, nurse, and driver was very often sufficient.

In analysing these observations it is obvious that the organization responsible for calling out these services must be re-examined. Unless one is on the spot it is difficult to appreciate the indecision which exists during the early stages of an incident. If the strength of a chain be dependent on its weakest link, then indeed the magnificent chain of A.R.P. service hangs on a very rusty link—the express warden's report. As others agree, it is in this that the fault for delay or failure in calling out services is found. One cannot blame these men, exposed to conditions strange and terrifying. Even in a heavily bombed district a local warden can seldom have been present at more than two or three large incidents. In consequence his rapid summing-up errs in judgment, he often forgets the existence of a mobile unit, and when the latter, after an appreciable time, is called out it is usually too late—the damage in handling and shifting cases has already occurred.

How, then, can this be remedied, as indeed it must, for in my own opinion a large proportion of those who died from shock would stand a reasonably better chance of survival if things could be otherwise arranged. The solution is obvious. The authorities have overlooked what must be by now the most experienced body of emergency casualty workers—the stretcher parties. The squad leaders I have found, as a rule, reliable, well trained, cool-headed in action, and with sound common sense. They are accustomed to incidents and know the worth of a mobile unit. I suggest that at any incident the leader of the first stretcher car on the scene should report back to Control if a doctor or unit is necessary; in that way a medical officer would be on the spot when ambulances arrive, to help by sorting cases, administering morphine, and generally supervising disposal. If there is no further need for his presence a message from Control to the incident officer would inform him where he is next required.

We have been told that this would be risking the doctor and unit unnecessarily. I feel that such an attitude of mind is resented, and rightly so, by stretcher parties. They are called out, often to no purpose, in the heaviest raid. A doctor on the scene improves their morale, and he can assume responsibility if necessary, and this makes them much more efficient. If this measure were taken we would surely not have casualties brought in "screaming with pain," as referred to in recent articles. I have often given up to 1½ grains of morphine to ease patients and make them comfortable at an incident. Immediate treatment of this type would materially reduce the danger of severe shock, at present so real. The battle for the lives of casualties may be determined by efficient treatment right from the outset. A ratio of 30,000 killed to 40,000 wounded is unduly high. During the last war, I understand, the consultants were all in favour of an absolute minimum being done in the forward positions and leaving all work for the base hospitals. When, as a result of the rising mortality and in spite of consultant opposition, more freedom was given to the junior medical officers in the front areas, the figures improved. We are learning this lesson again here.

Certain theoretical and practical points must be appreciated if any improvement is to result.

(1) The fall in blood volume and haemoconcentration is the important cause of secondary shock. (2) This fall precedes by many hours the fall in blood pressure; this latter is a comparatively late effect of shock, and may still be high when the condition of shock is well-nigh mortal. (3) Bayliss and Cannon have shown that the onset of experimental shock occurs in twenty minutes after trauma. (4) Krogh (*Anatomy and Physiology of the Capillaries*) states that temporary oxygen lack (due to deficient circulation) will cause irreversible stasis in the capillaries in fifteen minutes. (5) The sooner one can operate on badly mangled cases the better the survival rate. In the last war, when such cases were dealt with within three hours, the mortality was 11%; when left for nine hours it rose to 75%. (6) In the early stages simple treatment such as provision of warmth and fluid will maintain the circulation; in the late stages even intravenous blood or plasma will pass out of the blood vessels. (7) In the first period of shock, morphine, even in large doses, by relieving pain and anxiety, will help to improve the patient's condition; in the later stages it is theoretically unsound, for by depressing the respiratory centre it increases the oxygen deficiency of the capillaries, and hence their permeability. (8) Pitressin, which theoretically causes capillary contraction, if administered early might be of value. (9) The early treatment of minor factors, such as cold, will improve a patient's condition considerably.

At present we are doing little to benefit by early experiences, for it is in the first link that a great deal can be done. Two thin blankets per stretcher as provided to stretcher parties at the moment are quite inadequate to keep a patient warm, who is often shivering while being shifted. There is no provision of hot-water bottles or drinks for casualties in the early stages. By arranging for supplies of hot glucose-saline to be taken out by stretcher parties (and this can easily be done) the

administration of fluids by the mouth in the early stages, by restoring blood volume before absorption via the mucous membrane of the gut fails, will prevent the onset of secondary shock. These measures, combined with the early attendance of a medical officer or a mobile unit on the scene, will greatly help us to improve our figures.—I am, etc.,

E. CRONIN.

April 27.

Sulphapyridine and Suppression of Urine

SIR,—The recent correspondence on suppression of urine following crush injury, and in particular references to its occurrence in cases which have undergone sulphapyridine treatment, prompt me to mention the following case.

A young woman had been under treatment for a few months with sulphapyridine in moderate doses daily. I stopped the drug, and after an interval of three to four weeks administered 1 c.cm. of a bacillary emulsion intravenously. This produced the desired rise in temperature, and forty-eight hours later sulphapyridine was given in doses of 3 grammes daily. The next day the patient complained of sickness and pain, with tenderness referred across the abdomen. There was no frequency or dysuria, no rise in pulse or temperature. I ascribed the upset to the sulphapyridine and stopped the drug, but the pain became slowly worse, and the tenderness extended round into the flank, most marked on the right side—almost suggesting appendicitis, but in a zone higher up. There was no symptom of urinary disorder up to forty-eight hours after the commencement of the sulphapyridine, but after that time no more urine was passed.

The next day the bladder was empty, heat was applied to the loins and lower abdomen, and later a catheter was passed without result. After three days' anuria I transferred the case to hospital, and in accordance with the suggestion of the Edinburgh school commenced intravenous sodium sulphate in glucose-saline by continuous drip.

On admission the general condition of the patient was remarkably good. There was some pain in the back, the right side tenderness had increased, and there was some abdominal distension, which gave rise to discomfort. There was no headache and no oedema; the tongue was remarkably clean and moist. Pulse 80; temperature 97.4°; blood pressure 165/100. During the next forty-eight hours she received 2,500 c.cm. of the infusion, and at the end of this time the patient thought she had passed some urine, but nothing could be seen. A catheter was introduced, and in a few hours 2 oz. of blood-stained urine collected. The first urine passed for five days was blood-stained; specific gravity 1020, albumin + +, acetone +. No laboratory facilities were available, so fuller investigation was not made.

The general condition of the patient was still reasonably good, though she was greatly distressed by the pain in the kidney region and by the abdominal distension. The next day distress was more marked and only 4 oz. of urine was passed; this was not now blood-stained. Free fluid was noticed in the abdomen and pleural cavities. Blood pressure had risen to 190/110. The urinary output increased to two pints on the following day, but the pain and distress were unchanged. Some oedema of the sacral region and ankles was noticed. The pulse rate rose to 130 and the respiration was embarrassed by the abdominal distension. Seven pints of free fluid were slowly aspirated from the peritoneal cavity.

For the next two days the urinary output was only 10 oz. and 12 oz., and little change could be observed in the patient's condition. A large tender mass, the size of a large grapefruit, evidently kidney, was palpable in the right kidney region. This mass gradually diminished and the urinary output returned to normal. There were, however, some occasional rigors in the uneven convalescence, but the urine is now normal in quantity and contains no abnormal constituents.

It is now five weeks since the onset; the right kidney is no longer palpable, and the patient is feeling very well indeed, with blood pressure 130/75.

On admission to hospital I was tempted to recommend passing a ureteral catheter, but after consultation it was decided not to do so lest we change what might have been a temporary anuria to a more permanent one, especially as the patient's general condition was so good. *X*-ray examination did not show presence of a calculus.—I am, etc.,

Northallerton, April 29. H. G. HANAN.

Cause of Appendicitis

SIR,—Dr. C. Leleu (May 3, p. 689) agrees that the cause of appendicitis is trauma. I have never suggested that trauma occurs in the infantile appendix only, but that the initial trauma (the starting-point of a train of morbidity which culminates in an acute attack) probably occurs when the appendix like the rest of the tissues is tender and specially vulnerable, and when it is too often exposed to trauma from foreign bodies in the shape of ill-digested or improper food. That such bodies, frequently passing in and out of the appendix or lodging in it, may start the morbid process (which appears in various forms) is at least a reasonable supposition.

He tells us that the appendix he had just removed was "normal except that it contained a coprolith." Surely that appendix was abnormal or morbid. The presence of the coprolith was evidence of morbidity arising from trauma which may have occurred many years before, possibly in infancy, and at any moment it might have inflicted further trauma resulting in an acute attack. His patient suffered from appendicular colic, and I believe it is generally agreed that this or some other evidence of morbidity can usually be found either in the clinical history or in the pathological examination (or both) if carefully sought. What exactly are the attacks of colic (wind) to which artificially fed babies are so prone? A careful study of the symptoms (the sudden onset and sudden relief, the obvious spasms or visible peristalsis, etc.) suggests the passage of a foreign body into and out of the appendix as the most reasonable explanation. Recently someone reported the safe removal of the appendix in a baby a few weeks old who was suffering from appendicitis. (I'm sorry I cannot find the report.) If only he had given a clinical history and detailed account of the pathological findings he might have advanced our knowledge considerably. A systematic properly organized investigation on these and other lines is long overdue; no one man could possibly deal with all the different kinds of evidence which should be collected.—I am, etc.,

Ambleside, May 5. J. PRICE WILLIAMS.

Certificates by Practitioners

SIR,—In connexion with the alleged laxity in issue of certificates by general practitioners, I am sure that the whole position could be clarified if an official ruling was given concerning certificates in special cases. The General Medical Council should prohibit the issue of certificates of the sort mentioned by Dr. J. B. Wrathall Rowe. Such a ban would be welcomed by the profession since much friction between doctor and patient could be avoided if a refusal could be supported by an official statement.

The majority of the profession are anxious to avoid trouble between "works" doctors and general practitioners, but it must be realized that many doctors have no experience of factory conditions, and, conversely, the difficulties of general practice are not always appreciated by doctors working for industrial concerns. The tendency of firms to demand a medical certificate from an employee who takes time off from work to see his doctor is apt to cause irritation to the practitioner, who is already harassed by a multiplicity of forms.

I have known many valuable hours wasted when patients have been sent away to obtain a medical certificate before being allowed to start work. In some instances the cause of the patient's absence has been as clear to the employer as to a doctor, and a certificate is only required to meet the firm's regulations. I refer to such conditions as haemorrhage following teeth extraction and contusions resulting from falls. In the former instance bleeding has often stopped when the doctor arrives, and there may be little evidence that excessive haemorrhage has occurred as patients are prone to exaggerate the severity of the condition. Is a certificate stating that the patient was unable to work by reason of "haemorrhage following extractions" justified on the scanty evidence available? Remember that the certificate relates to the time immediately preceding the visit, and that failure to issue such a certificate may cause suspension of the patient's salary.

I consider that certificates can be put into three classes: *Class 1.*—No doubt exists of a patient's inability to work—for example, concussion, fractured femur, etc. *Class 2.*—Where a patient's inability to perform certain duties is largely a question of opinion. In cases where the doctor is not acquainted

with the special conditions of work he should refer the patient to the works doctor without comment, but more difficulty exists with fire-watching. Patients sometimes claim exemption on grounds of bronchitis, peptic ulcer, and neurasthenia. Although the honesty of the profession to protect the national interests involved must ultimately be relied upon, some official guidance would be helpful in dealing with a problem where opinions may differ so widely. *Class 3.*—"Nuisance" certificates. In this class I include "cheap milk" forms, certificates recommending reduced rates of travel to see evacuated children, and requests for certificates relating to sick relatives of men serving in H.M. Forces in order to obtain extra leave.—I am, etc.,

Welling, Kent, May 10. H. G HOWITT.

SIR,—It is common knowledge that medical certification by general practitioners is often lenient. As general practitioners are in a much closer relationship with their patients than their colleagues who hold official positions, it cannot be otherwise. They act not merely as judge and jury, but also as friends and advisers. This was recognized at the inception of the National Health Insurance Act, and the ancillary Regional Medical Service was originated to counteract it, with success. Certification for purposes other than National Health Insurance has no such counterweight, but general practitioners cannot be blamed for that.

As for the certificate exemplified by your correspondent, Dr. Wrathall Rowe (May 10, p. 732), I see in it nothing "ludicrous in the extreme," or even ludicrous. Apart from the operative word "unable" in the certificate—obviously incorrect—the meaning to me is abundantly clear—namely, that X's wife is so liable to attacks of nervous distress as to make it inadvisable for her to be alone at night. And who should know this better than X himself and his doctor? Surely not Dr. Rowe. I could, with truth, issue similar certificates to two or three patients in my own practice.

Criticism of general practitioners seems to come easily to the official practitioners—so easily that I once indulged in it myself. Successfully to conduct and to hold a general practice is far from easy, and only those who have had this experience can fully realize its inherent difficulties—difficulties not encountered in other branches of the profession. Laxity in the mere wording of certificates there may be, but a general practitioner may issue hundreds of certificates in a week. Leniency in the opinions expressed there may be, but then there are no absolute criteria for fitness or unfitness for such work as fire-watching, night-duty, and shift work. And general practitioners are not alone to blame for leniency; blame, rather, those factors and forces, quite outside their control but quite understandable by them, which tend so much to modify and to implement their actions. No present regulations or rules will, I think, alter this state of affairs.

As for the Warning Notice issued by the General Medical Council, this surely applies to deliberate untruthfulness: very different from leniency, or laxity.—I am, etc.,

Barnsley, May 12. S. CURRY.

Treatment of Diphtheria

SIR,—I am trying out diphtheria serum and sulphapyridine together, and I believe the latter reinforces the former to some extent. If there are any haemolytic streptococci in a throat, as well as diphtheroids, it would certainly scotch them: and it may be also that various organisms in the mouth, non-pathogenic in health, become pathogenic when diphtheria has sufficiently decreased the resistance of the tissues. So sulphapyridine would probably scotch them too. I think proper controlled experiments should be made on serum and sulphapyridine in some hospital where research is carried out.

To my way of thinking the full treatment for diphtheria should be: serum and sulphapyridine, glucose, vitamin B, vitamin C., I also think that diphtheria patients should not be kept rigorously lying flat on their backs. If they like to turn on to their sides, draw up their legs, or stretch out the arms, I think they should be allowed to do so, since the movements probably keep up the tone of the heart muscle. Also mucus would not tend to accumulate in the bronchi, and the blood would not tend to gravitate to the posterior surfaces of the lungs.

My idea of diphtheritic paralysis is that the various portions of the C.N.S. are struck at once but that there are different latent periods before the paralysis shows itself. I think that respiratory paralysis has a longer latent period than palatal paralysis, and that merely resting neither prevents the paralysis nor stops it spreading. If that is so, then one might just as well move about. Comments will be much appreciated.—I am, etc.,

Liverpool, April 30. FLORENCE M. E. DAVIES.

"Bureaucratic Surgery"

SIR,—Is not the question of "who shall treat" wounds of the scalp, or indeed primarily treat other wounds of special regions, largely a problem of transport and distribution? One admits that they will be treated with 100% efficiency in the neurosurgical centres; also that even in peace they are very inefficiently treated in places where one would look for better things. Can, however, all or nearly all the cases reach such centres in time for the primary toilet which is so essential? Only to-day did a case reach me which had sustained a scalp wound fifty-seven hours previously and had been in another hospital. The wound was concealed by a mass of clot and extraneous dirt covered by a dressing of gauze. If the patient took all this time to get out of the danger zone how could he hope to reach any special centre in time for adequate treatment?

Are the neurosurgeons not in danger of committing the error of condemning patients to wait until only a bad result is possible by attempting to prevent earlier treatment, perhaps not quite so good as the centre would offer could the victim reach them in time, but more adequate under the circumstances? It might be argued that my case ought to have been sent to a neurosurgical centre rather than here. So it might had not bombs been dropping at inconvenient intervals.—I am, etc.,

May 10. W. A. MACKAY.

Cleansing Eyes of Gas at First-aid Posts

SIR,—The problem of the gas cleansing of eyes at first-aid posts seems to call for special attention. The official practice is to douche eyes at the entry side of the gas cleansing unit. The usual routine is: (1) douche eyes, (2) bleach, (3) rinse, (4) soap (the most important part of the operation), (5) rinse, and (6) dry.

I suggest an improved technique (modified to suit local conditions) as follows: (1) Patient stands under shower with eyes closed and his face and hands are rinsed; (2) bleach, (3) rinse, (4) soap, (5) rinse, (6) douche eyes. The object of this procedure is to avoid further contamination by the person treating the eyes on the clean side of the showers.—I am, etc.,

G. C. F. ROE,
May 12. Medical Officer of Health, Halifax.

Testing Night Vision

SIR,—My attention has been drawn to the *Journal* of April 26 (p. 636), in which you include a description by Mr. N. Bishop Harman of a test for night vision which I have designed and which is now being marketed by Sir Isaac Pitman and Sons. In the course of this account some criticisms are made which, although I do not consider them to be valid, I do not wish to comment on here, with one exception. This exception is a statement of fact which, if true, would make the test practically useless; it is, however, incorrect. The test consists of a faint light source provided by a disk of radium luminous compound which illuminates a series of cards of a broken circle of various degrees of grey printed on a black background. In your review the following statement occurs: "It is evident that the radium illumination may be variable. There can be nothing standard about it." If this were true, it would mean that on one occasion an observer would be able to see one card in the series, and on another occasion he would be able to read a different card, so that the results obtained would mean nothing at all. In practice, each disk has been selected so as to provide the proper level of illumination when first sent out and does not subsequently diminish by more than 25% during the next two years. This change is quite unimportant, and at the end of two years a new disk can be purchased. Provided the disk is not misused, and provided the directions are followed as to opening the test in the dark, no other changes in intensity will occur, and the source is, in

fact, a standard source. In support of this, it may be mentioned that the same material is now used as a light source in a standard gauge for testing the level of A.R.P. lighting.

The test does, therefore, satisfy the need, indicated by your reviewer, for a "standard test that could be set up by an ophthalmic surgeon for himself, and yet would be the same for all," and I should appreciate it if you would make a correction to this effect in your *Journal*.—I am, etc.,

London, S.W.7, May 16. W. D. WRIGHT.

Reactions after Transfusion of Stored Blood

SIR,—Although the experience with stored blood at St. James's Hospital, Leeds, is as yet relatively small, sufficient evidence is available to indicate that this material caused no detriment to the patients. Our records were examined by the method of Dr. Eric Jewesbury (May 3, p. 663), with the following results:

Fresh blood was alone available during the period 28/10/39 to 12/12/40, when 225 transfusions, requiring 298 bottles of blood, were administered. The reactions observed were: Grade III, 10 or 4.4%; Grade II, 16 or 7.1 %; and Grade I, 17 or 7.6%. Thus there were in all 43 or 19.1% of reactions, of which 26 or 11.5% were severe. The transfusions were conducted by one or other of twelve medical officers.

Stored blood provided by the No. 2 Regional Transfusion Centre was used from 13/12/40 to 30/4/41, and on the average it was stored for approximately seven days. During this period there were 160 transfusions, requiring 216 bottles of blood. The reactions observed were: Grade III, 5 or 3.1%; Grade II, 6 or 3.8%; and Grade I, 7 or 4.4%—a total incidence of 18 or 11.3%, of which 11 or 6.9% were severe. These transfusions were conducted by one or other of fifteen medical officers of varying experience. It is pertinent to comment, also, concerning the Grade III reactions, that four of the patients each received a pint of blood in from 1¾ to 3¼ hours, when a slower rate of administration was indicated. The fifth patient had undergone evacuation of the uterus for incomplete septic abortion prior to transfusion.

It is reasonable to claim that if stored blood be unsafe our records could not have shown this distinct reduction in reaction rate following a change from the use of fresh to that of stored blood. Our experience fully demonstrates the advantages, by way of time and labour saved, of a satisfactory supply of stored blood.—I am, etc.,

Leeds, May 16. CYRIL POLSON.

Treatment of Burns

SIR,—I have read with considerable alarm the letter of Mr. Rainsford Mowlem (May 3, p. 686) in which he dismisses the use of tannic acid in the contemptuous words—"Perhaps it has its place in some burns."

In burns of small areas perhaps Mr. Mowlem's weapon of the future may have its place, but even here it has been shown in recent papers by Cohen, and by Ross and Hulbert, that if tanning is properly carried out it compares favourably with any other method. In large areas, however, the patient's very life is at stake if tanning is not carried out. Why is it that tannic acid so completely replaced all other methods after its introduction in 1925 by Davidson? Simply because it reduced the appalling mortality of burns from over 20% to under 4%. It is the ability of tanning to prevent secondary shock that made the remarkable reduction of mortality possible. It is why tanning very definitely has its place in the treatment of burns.—I am, etc.,

London, E.9, May 7. W. D. PARK, F.R.C.S.

Post-war Medical Education in London

SIR,—The article by Mr. Somerville Hastings (May 3, p. 678) prompts me to put forward a suggestion for the present and future training of medical students complementary to those made by him. Towards the end of last year the Norfolk and Norwich Hospital offered to the deans of several London medical schools facilities for students to carry out part of their clinical training. This offer was accepted, and so far twelve students, most of them from one hospital, have been sent. This one hospital has arranged to send students at regular intervals for the duration o. the war. In addition, under a more recent arrangement, three students are being appointed for three-month periods as student house officers, acting under supervision. The advantage of this arrangement —to the students of the additional experience and to this hospital during the present shortage of qualified residents—is obvious. All the students have noticed and appreciated the quality and amount of clinical material, of which the comparatively small number of students have been able to take full advantage.

The Norfolk and Norwich Hospital has 398 beds and works in close collaboration with the Jenny Lind Hospital for Children of 100 beds. It has large out-patient clinics with fully equipped ancillary departments, and is staffed by a consultant honorary medical staff experienced in teaching. It is clear that in similar hospitals all over the country a large amount of clinical material is available which could be used for the training of students, and the purpose of this letter is to suggest that after the war students should continue to attend provincial hospitals as a recognized part of their clinical training. It would not be difficult for arrangements to be made between the London teaching schools and approved provincial hospitals to second students for an agreed part of their clinical training, and I am sure that students would find such an arrangement of great value to them.—I am, etc.,

Norwich, May 17. MICHAEL W. BULMAN.

Medical Planning Commission

SIR,—The correspondence in the *Journal* on the Medical Planning Commission and collateral subjects seems to me to point to the necessity for a radical candid and entirely objective discussion of what, for many of us, is a fundamental article of faith—namely, the right of the patient to choose his own doctor. In the fight over National Health Insurance the insistence of the profession on this point undoubtedly had the support of the public and was largely instrumental in securing fundamental alterations in the original scheme.

I need not say to anyone who knows me what my opinion was and is. I stand for the right to choose my own doctor for myself, and believe it to be in the general interest. But as an honest man I cannot shut my eyes to several tendencies which seem to suggest that the public no longer lays the stress on it that it did a generation ago. First, there is the greatly increased tendency to resort to hospitals, where there is no choice. When I was in practice I had the greatest difficulty in persuading patients to go near a hospital, though probably the main reason was fear of what might happen rather than objection to a strange doctor. Then there is the growth of social medicine: patients, particularly women and children, have got the habit of resorting to welfare and other centres, where there is no choice. Thirdly, there is the significant and to me the extremely disappointing and disconcerting fact that free choice is so little used in National Health Insurance. In normal times the number of changes of doctor never faintly resembled what happens in private practice. No doctor can possibly please all his patients, and in private practice they simply leave him. Granting that the insurance regulations make transfer much more difficult than in private practice, the statistics of change make it difficult for me to believe that the people concerned are as appreciative of their rights as I always hoped they would be. Fourthly, the passive way in which insured persons allow themselves to be transferred when a practice is sold seems to me significant.

Now, if these tendencies, and others I could adduce, mean that the public is attaching less and less importance to the value of their right to exercise their own choice, the significance of this tendency can hardly be over-estimated in the discussions now going on. Any medical service must be based on the best interests of the patient. If the patient is now only anxious to be given the best advice and treatment, and more or less indifferent where he gets it, the hands of those who want a kind of medical civil service are strengthened.

I firmly believe that a candid discussion of this fundamental aspect of medical practice should be one of the first concerns of the Medical Planning Commission, and as that body is bound to be guided by what it believes the public want and should have, I hope that many men of large and current experience in general practice will state their opinion. What we *should* have, of course, is the opinion of the patients themselves, but I know of no way of getting this except through the voice of those who are in close touch with them. We want candid opinions from men of experience who have

thought over the tendencies to which I have drawn attention. If there should be a consensus of opinion that the people no longer value the choice of their own doctor, I should regard it as a retrograde tendency, but should bow to it as a regrettable necessity. If, on the other hand, we could be assured that the old regard for the family doctor still persists, it must greatly influence any decisions arrived at by the M.P.C. and by any Government. The question seems to me to underlie the whole discussion.—I am, etc.,

Henley-on-Thames, May 12. ALFRED COX.

DR. A. D. FRAZER, honorary secretary of the Nottingham Division, British Medical Association, sends for publication a copy of the following letter written to Dr. G. G. Genge, Honorary Secretary of the Croydon Medical and Panel Committee, in reply to that committee's circular of April 10 regarding the Medical Planning Commission:

Dear Sir,—Your letter of the 10th inst. was read and discussed at the annual meeting of the Nottingham Division, held on Thursday, 24th inst. The meeting decided that it could not agree with your Committee's resolution to "dissociate itself, in advance, from any findings of the Medical Planning Commission, as at present constituted." In the view of the meeting the Commission should be given the opportunity of doing its work as a "fact-finding body." Suggestions and plans arising from the facts thus found could then be discussed at Division/Branch meetings throughout the country and at meetings of all practitioners in each area, thus affording every practitioner the opportunity of expressing his views and taking his share in formulating any desired changes.—Yours faithfully,

Nottingham, April 29. (Sgd.) A. D. FRAZER.

Reactions after Ethanolamine Oleate Injections

SIR,—Several preparations of the newest sclerosing agent ethanolamine oleate are now on the market, and I note that the advertisements and pamphlets all seem to imply that as regards reactions this substance is trouble-free. Admittedly reactions are probably very rare, but an experience of mine may prove of interest.

A woman of 38 was seen two years ago and had six 2 c.cm. injections of sod. morrhuate. Following the last injection she reported a profuse urticaria, and then remarked that she had it very mildly after a previous injection. She was next seen a few months ago with some veins in the other leg, and since ethanolamine oleate was then definitely advertised as being reaction-free some was obtained. Before it came a dose of quinine urethane was administered with no untoward effect. A dose of 1.5 c.cm. ethanolamine oleate was injected, and she reported that "about half an hour later my face was like a beetroot, but it soon passed"; actually she did not herself attribute it to the injection. Having reread the literature I gave an injection of 1 c.cm. with no reaction; next 1.5 c.cm. was inserted and severe anaphylaxis followed at once, which slowly improved with the usual treatment. The result on the veins was, fortunately, all that could be desired.

It would appear to me, therefore, that this substance can produce reactions, and that care should be exercised when changing from sod. morrhuate for this reason. I may say that this particular bottle was subsequently used on other patients with no reaction.—I am, etc.,

May 1. F. J. BRICE, M.B.

Vitamin C from Rose-hips

SIR,—In its April *Bulletin* the Children's Nutrition Council reminds us that we must attend to our supplies of vitamin C for baby feeding. They recommend that the whole crop of blackcurrants in the country should be reserved for the production of a purée to replace orange juice for infants. For the prevention of infantile scurvy one ounce daily (estimated to contain 30 mg. of the vitamin) would be required. Such a purée would be canned, and the contents are reported to remain fresh for a fortnight after the tin is opened.

It is stated that carrot juice is not a satisfactory source of the vitamin, and it is implied that although some varieties of turnip are a good source, this is not true of all varieties. The recommendations which I have seen for the extraction of turnip juice are two: the first is to cover the sliced root with sugar; the second is boiling. Miss M. Olliver has recently stated that if the root is sliced thinly and boiled for half an hour "extraction was great and destruction by boiling was very small."

All these sources have definite limitations, if not drawbacks. In Denmark the vitamin C which is used in children's hospitals and nursery schools is derived from the rose-hip. I called the attention of the Ministry of Food to this in September of last year, when a large crop of these berries was to be seen in our hedgerows. Prof. Drummond confirmed the high vitamin C content of rose-hips. I understand that a jelly can be prepared from rose-hips without the use of sugar, and that this is palatable and well liked by infants. In Denmark, however, the preparation was a bottled fluid.

We have now a good six months before the new crop of berries will be ready for harvesting. The obvious people to do the conserving are the Women's Institutes, as they are already entrusted with the sister industry of jam-making. Children, through schools, scout troups, and other organizations, could well be enlisted for the harvesting. It remains for the scheme to receive official recognition, together with a simple and effective recipe (as near fool-proof as possible) for the jelly or conserve.

May I be permitted to invite the profession to encourage this little skirmish in practical dietetics?—I am, etc.,

K. E. BARLOW, M.R.C.S., L.R.C.P.

Coventry, May 13.

*** Brief notes on rose-hip jelly were published in the *Journal* of March 29 (p. 500).—ED., *B.M.J.*

Air Embolism from Blast

SIR,—In your issue of January 18 there appeared some articles discussing the effect of high-explosive blast. The term "pulmonary concussion" was used to denote one of its outstanding effects: but as a rule the post-mortem findings have not been sufficient to account for the patient's death.

A possibility which has not been mentioned is that of air embolism. The immediate effect of the explosion is to create a very strong positive pressure in its vicinity, and this would increase the air dissolved in the blood considerably. Subsequently there is a rarefaction of the atmosphere. This would lower the pressure in the lungs below normal and lead to a rapid withdrawal of the previously dissolved air in the blood. Hence there would be a strong tendency for air bubbles to form in the blood and possibly also in some of the tissues, which are especially susceptible, such as the central nervous system. Lastly, the pressure externally stabilizes. This would have the same effect as recompression in caisson disease, and by counteracting the effect of rarefaction drive the air bubbles back into solution. Hence the post-mortem examination might show very few of the typical signs of air embolism.

Trusting that this explanation might be of some value in the elucidation of the condition.—I am, etc.,

Capetown, April 17. S. SCHER, F.R.C.S.

Discission of Secondary Cataract

SIR,—A student, when talking about the most suitable instrument for discission of secondary cataract, said to Ziegler that he thought there was nothing better than the instrument which bore that name. "Oh yes; there is something better—two Zieglers," replied the surgeon. With that remark, and Mr. Bishop Harman's well-described *modus operandi* in your issue of May 3 (p. 687), most of us will agree. However, if we use two needles, it does not necessarily follow that the case will not present difficulties, but these will certainly be less if we use mydricain.—I am, etc.,

London, W.1, May 12. F. E. PRESTON.

Neutrons in the Treatment of Cancer

SIR,—The discussion of the effect of neutrons in cancer (March 22, p. 447) raises an interesting point. As the energy exhibited by a given force is proportional to the resistance which it meets, it should be worth while to determine the effects of the stoppage of all rays passing through tissue by placing metal behind it. Whether the production of reflected rays by a metal screen placed behind tissue be practicable or not, there is no doubt that the arrest of so many rays must cause a great increase in the local exhibition of energy, no matter what the source of the rays may be.—I am, etc.,

Montreal, April 15. RICHARD KERRY.

Adrenal Graft in Addison's Disease

SIR,—Dr. J. J. Conybeare (May 3, p. 688) is perfectly correct in doubting the diagnosis of Addison's disease in a patient without pigmentation. I have seen numerous cases of this condition, but never one without pigmentation of the skin, and particularly of the buccal mucous membrane and tongue.

As a matter of interest, a patient I saw first in 1930 with all the classical signs of the disease and a systolic blood pressure of 75 mm. Hg—and treated with eucortone—is still alive, cheerful, and performs all her household duties. Despite her remarkably good health when I saw her a few weeks ago, she has never lost her pigmentation, though it is markedly paler than it was five years ago.

In my view the prognosis in women should be less unfavourable than in men, if they can be kept alive long enough for their cortical "rests" to take up the function of the adrenal cortex. They have the additional advantage of Marchand's organ in the broad ligament, which is composed almost entirely of cortical tissue.—I am, etc.,

Brookwood, Surrey, May 10. H. M. STANLEY TURNER.

Treatment of Scabies

SIR,—The columns of your *Journal* and its contemporaries continue to publish comment on scabies. Modifications of the older methods and innovations are suggested. Deductions are drawn from inadequate clinical data and empirical findings. Often a small number of cases has been considered. Patients have been observed in favourable circumstances—that is, hospitals, temperate climates, and controlled hygienic surroundings. May it not be worth while for a moment giving thought to certain fundamental facts regarding the invading organism and its "habitat," the human skin?

Scabies is an infection of a delicate tissue with a highly resistive organism depositing eggs therein. In theory it should be easy to find some medicament which rids the human body of the acarus; in practice such solution is not easy, since all known antiparasitics are irritative, and little consideration is given to the manner in which ova are buried and the method by which medicament and vehicle reach them. Lengthy clinical relief may be hoped for if the fully developed acarus is killed, but permanent immunity is unlikely unless all ova are eradicated.

It would appear certain that an ideal therapeutic agent and vehicle will only be found when a procedure has been found which:

1. Entails a mechanical opening, rather than a physico-chemical penetration, of burrows (there is no known wetting agent which permits spread of vehicle along a tunnel);
2. Involves the use of a non-irritant (rotenone derivatives are not likely to fall within this class in the presence of heat, friction, and perspiration; scrotal dermatitis of this origin is highly intractable);
3. Considers the life cycle over at least ten days of the acarus;
4. Utilizes wetting agents to penetrate folds, fissures, and pustules in a manner which paraffin bases do not, but avoids consequent disadvantageous detergent and degreasing after-effect (soaps, alcohols, and emulsion bases all have this drawback);
5. Applies sulphur in a physically non-irritant molecular form (gaseous administration has been found impracticable);
6. Releases medicament from vehicle because of preferential solubility for the aqueous (? oil water emulsion film) terrain of the human skin rather than for its vehicle.

Can we not enlist the co-operation of the entomologist and the physical chemist? Clinicians to date appear to have ignored their existence, to our loss.—I am, etc.,

Manchester, May 16. P. B. MUMFORD, M.D., F.R.C.P.—

Laryngitis in Secondary Syphilis

SIR,—The following case is of some interest, as it depicts secondary syphilis in one of its rarer manifestations—that is, laryngitis.

A soldier, 23 years of age, was sent up by his medical officer to the throat department of the hospital in which I am working. He complained of a hoarse voice of two weeks' duration. There was no past history of hoarseness or loss of voice. The voice was hoarse, strong, and painless. On examination, his pharynx was generally injected. The larynx showed marked hyperaemia and infiltration of the ary-epiglottic folds, and of the mucous membrane over the arytenoids. The vocal cords were not injected; abduction and adduction were normal. There was no secretion anywhere. On the tongue were three superficial ulcers, each about the size of a threepenny-bit, and all situated on the sides of the tongue. Only the surface epithelium was eroded, and the papillae showed up strongly. These ulcers were entirely painless. There was bilateral rubbery enlargement of the cervical glands.

He was sent to the V.D. centre for a general examination and Kahn test. The report was: "History of primary sore some months ago. Typical anal condylomata found; these have been scraped and spirochaetes obtained. Kahn reaction strongly positive." Anti-syphilitic treatment was accordingly started. The ulceration of the tongue vanished at once, and the larynx shows much less infiltration.

The points of interest are: (1) The only complaint was hoarseness; the appearance of the larynx suggested the diagnosis. (2) Mucous patches on the tongue only.—I am, etc.,

H. S. SHARP, F.R.C.S.,
March 14. Major R.A.M.C., E.N.T. Specialist,
Middle East Force.

Methods of Air Disinfection

SIR,—Referring to your annotation on methods of air disinfection (May 3, p. 675), may I mention a simple method which proved effective in the great influenza epidemic of 1918 and in the following years, and which was described in the *Deutsche medizinische Wochenschrift*, 1920, 19. One spread commercial 10% tincture of iodine on a glass or china plate, so that by swaying it here and there it covered the whole surface. The alcohol evaporated quickly, leaving a thin layer of the brownish-red iodine metal. According to the temperature of the atmosphere the iodine disappeared slowly, and the vapour, mixed thoroughly with the air by diffusion, effectively disinfected the space. Possibly the small amount of iodine resorbed by respiration, as is well known, makes the body more resistant against infection.

In order to keep the dust, silicates, etc., bound on the floor, I suggested to the Ministry of Home Security last year that the floors of the shelters should be moistened with a thin layer of linseed oil.

Both of these methods may accomplish the recommendations discussed so eminently in your article about prophylaxis in the shelters.—I am, etc.,

London, W.1, May 12. J. PLESCH.

Measuring Genius

SIR,—From reading your interesting leading article (May 17, p. 756) on Prof. Terman's monumental work one is forced to the inevitable conclusion that, however worthy, the deluded professor has been barking up the wrong tree. If the title is sound, then the whole work is pure bosh; and, alternatively, if the title were altered to "Genetic Studies of Successes and Possessors of Respectable Bank Balances," then most of what is written would undoubtedly hold good.

Success of more than fleeting duration calls for in its devotees most of the qualifications which Prof. Terman thinks the ear-marks of genius—versatility, emotional stability, good health, socially desirable wives, contentment—certainly contentment: one must think what one is doing is worth while—and, above all, sharpness, or rather smartness, of intellect as assessed by the intelligence test.

A genius, on the other hand, in contradistinction to most of us, occasionally thinks for himself and perforce is a bit of an outcast from the clan and consequently undesirable in the psycho-analytical sense; or he must possess a heaven-born gift of intuition, which perhaps is much the same thing.

Now success presages neither of the above attributes, and although in business a little of the latter might conceivably be helpful, in academic spheres even a trace of the former would prove fatal.—I am, etc.,

Thame, Oxon, May 17. E. GRANGER, M.B.

Obituary

GEORGE LOVELL GULLAND, C.M.G.
LL.D., M.D., F.R.C.P.ED.

The death of Prof. Lovell Gulland occurred at his house in Edinburgh on May 4. For some time he had been crippled by arthritis but he had been seriously ill for only a week. He was born in 1862, the son of John Gulland, merchant and magistrate of the City of Edinburgh. His brother, J. W. Gulland, M.P., was for some years Chief Whip of the Liberal Party in the House of Commons. He married the second daughter of the late Prof. Masson of the Chair of English Literature in the University of Edinburgh. His son is Professor of Chemistry in the University of Nottingham, and his daughter is married to Prof. Masson, Vice-Chancellor of the University of Sheffield.

Professor Gulland had a distinguished student career. As an undergraduate he acted for a year as research assistant to Prof. Ray Lankester at University College. He took the degrees of M.A., M.B., and B.Sc. at Edinburgh University. His M.D. thesis on the development of lymphocytes is a classic. In early professional days he was resident physician to the Royal Infirmary and to the Royal Hospital for Sick Children, Edinburgh. Thereafter he became private assistant to the late Sir Thomas Grainger Stewart. He held numerous appointments: physician to the Royal Infirmary, to the Chalmers Memorial Hospital, and to the Royal Victoria Hospital for Tuberculosis. He was principal medical officer to the Scottish Widows' Fund.



Gulland had an enormous teaching experience. He conducted a course of practical instruction on the examination of the chest at the Victoria Hospital. With the late Sir Robert Philip, he held a popular class on methods of diagnosis. His classes on haematology were among the first of their kind and were largely attended. In 1907 he became lecturer on medicine at Surgeons' Hall, and in 1915 he was elected to the chair of medicine in the University. By this time his consulting practice had become enormous. In 1916 he became consulting physician to the Forces at Malta with the rank of colonel. His services were recognized by the award of the C.M.G. He was secretary to the section of medicine at the International Congress of Medicine in London in 1913, and was chairman of the Foreign Guests Committee and of the Section of Medicine at the British Medical Association Meeting in Edinburgh in 1927.

Gulland was a pioneer in haematology. His contributions to its literature were very numerous. He was awarded the Freeland Barbour fellowship for the best work carried out in the laboratory of the Royal College of Physicians within the previous two years, and in 1926 he received the Cullen prize of the College, which is awarded to the Fellow who during the previous four years has made the most important contribution to practical medicine. At a later date he became curator of the College laboratory. Besides numerous magazine articles Prof. Gulland was joint author with Dr. Goodall of *The Blood*, and with Prof. Stanley Davidson of *Pernicious Anaemia*. After his retirement from his Chair and from the staff of the Royal Infirmary he became a manager of that institution and threw himself whole-heartedly into the administration of its affairs.

The great characteristics of Gulland's personality were his boundless energy, his wonderful flow of ideas, his memory, and his mental quickness. It is not generally known that the citizen of Edinburgh, if so minded, can play golf, catch trout, or shoot grouse without crossing the city boundary. It was not uncommon for Gulland in an interval between consultations to get on to his bicycle, find a nook by a pond and start or finish a water-colour sketch. If longer time were available he would ring up a friend and announce, "There is time for nine holes before dinner: what about it?" Unfortunately these intervals became more rare as his work increased, the cycle gave way to the motor car, and relaxation was almost entirely limited to a spring and autumn holiday. Gulland began to suffer from arthritis, and while he remained active till a week before his death he was greatly crippled.

Gulland had no affection for formality or ceremonial. He was a capital business man. He was a dignified and much respected President of the Royal College of Physicians, but "the great occasion" had little appeal for him—except, now and then, to his sense of humour. His teaching was informal and conversational but he gave full value to his audience. In his writing he was a little apt to forget that the ordinary mortal requires such aids as headings and paragraphs. In speaking he had none of the tricks of the orator, but he kept his audience interested, amused, and often amazed at his memory and his wealth of illustration. Gulland was a great asset at informal gatherings. His humour, his mental agility and his willingness to contribute in speech, story or song made him a most agreeable companion. He had a great place in the life of Edinburgh. He was affable and kindly, a delightful host, devoted to his family life and (with every reason) a very proud grandfather.

A. G.

The following personal appreciation is from the pen of another Edinburgh colleague.

The tidings of Prof. Lovell Gulland's death have brought sorrow into the hearts of his former students, colleagues, and countless friends at home and over-seas. Born nearly four score years ago, Gulland had a most distinguished career. As a young physician in Edinburgh he began those pioneer investigations in the research laboratory of the Royal College of Physicians upon the morphology of the blood and blood-forming tissues which entitled him to be styled, in later years, the "doyen of British haematology." It is in large measure upon his work in this sphere that Gulland's world-wide fame rests. Much of his great experience in this subject is embodied in *Pernicious Anaemia*, published in 1940, of which he was joint author. Gulland quickly became recognized, not merely as a keen laboratory worker, but also as a most accomplished physician. When I became his assistant physician nearly thirty years ago Gulland was a clinical teacher of extraordinary intellectual vigour and brilliance. The foundations of his conspicuous success in this field were laid in his early scientific training and research. Each day before his ward visit and teaching he made a personal study of the material being subjected to miscroscopical and biochemical analysis. He had a complete grasp of his subject, knew his cases thoroughly, yet treated them as patients, and had an innate gift, not merely of teaching, but of training his students, to each of whom he was a friend. In his clinical teaching the art, rather than the science, of medicine and the practical aspect of all therapeutic measures were constantly kept in the foreground, for he never forgot that nearly all his hearers would become medical practitioners. By reference to cases he had seen in former years he would frequently clarify a difficult point in diagnosis, and illustrate the value of a particular line of treatment.

It was in the diagnosis and treatment of acute disease that Gulland was pre-eminent. Thus it came about that he was *facile princeps* as consulting physician to the Forces in Malta in 1915, when the island, from Valetta to St. Paul's Bay, was a huge hospital, crowded with men evacuated from Gallipoli because they were suffering from acute dysentery, enteric fever, infective jaundice and other acute conditions. During that trying period his robust constitution, sanguine temperament and immense capacity for work stood him in good stead. His cheery smile and reassuring words could not fail to bring fresh hope to thousands of our sick soldiers. From Malta he was recalled amidst general acclamation to fill the Chair of Medicine and Clinical Medicine in Edinburgh, rendered vacant by the death of John Wyllie. During the thirteen years while Gulland held that office his lectures on the practice of medicine were characterized by a vigorous, lucid and helpful exposition of general principles. Throughout those years he was at the climax of his activity as teacher and consultant. In the latter capacity his professional skill deservedly commanded the confidence of his medical brethren and the public. His opinion was widely sought in all manner of difficult medical problems: in cases of anaemia of obscure origin his verdict was the final

court of appeal. He had a rare gift for quickly recognizing the essential feature of a difficult case and for not being misled by side issues. With him diagnosis was based upon solid foundations, prognosis upon sound judgment, treatment upon an unrivalled clinical experience.

After his retirement from the Chair his great powers of administration were given full rein as a member of the Board of Management of the Royal Infirmary: to his unerring judgment and tact we are indebted for the happy solution of maintaining an adequate and efficient honorary medical and surgical staff during the present emergency. For advice and guidance upon matters that are sometimes termed "medical etiquette" younger members of our profession would turn to Gulland, for he was the soul of honour, ever seeking and holding fast to that which is right and true. He was the very embodiment of Burns's "social, friendly and honest man." Everyone liked and admired him; those who knew him best loved him most. Unostentatious, of simple tastes and with a keen zest in all that is good in life, he was happy in his relation with men of all classes, in his work, his pleasures and, above all, in his home. A most genial host, he shone in any social gathering and had the delightful faculty of enlivening with songs of his own composition the informal meetings of Edinburgh medical dining clubs. We shall miss our revered Chief, colleague, and friend who has passed over to the other side, and in the days to come remember with pride and thankfulness his inspiring example.—W. J. R.

REDMOND ROCHE, M.R.C.S.

We regret to record the death, at the age of seventy-four, of Dr. Redmond Roche, who began his medical career in his native Ireland, but was for many years a well-known practitioner in the city of Westminster.

Redmond Roche was educated at Clongowes Wood College and what was then known as the Royal University of Ireland. He qualified in medicine in 1894, taking the English Conjoint diplomas and the licentiateship in midwifery (with special certificate in gynaecology), Rotunda Hospital, Dublin. Before crossing St. George's Channel he held a number of posts in Ireland, including that of demonstrator in anatomy at the Royal College of Surgeons and house appointments at Richmond Hospital, Whitworth Hospital, and Hardwick Fever Hospital in Dublin. He was for a time surgeon on R.M.S. *Vancouver* of the Dominion Line, and he also served as surgeon major in the 1st Cadet Battalion, King's Royal Rifles. During the early part of the last war he was an examiner of recruits in Whitehall and later medical officer in charge of the Scots Guards department, Wellington Barracks. In Westminster he practised at Eccleston Square, and among other public appointments he was medical officer to the Western Dispensary, Westminster. He joined the British Medical Association in 1897, and in 1925-6 he was chairman of the Westminster and Holborn Division. But his chief interest in medical affairs outside his own practice was as an active member and for many years president of the Society of Members of the Royal College of Surgeons. He took part, year after year, in moving the resolution, always carried and never acted upon, demanding the representation of members of the College Council. Unlike some of his colleagues in bygone years during these annual tilts at the council, Redmond Roche always spoke with the greatest suavity and reasonableness; nobody could better disguise a combative spirit in a gentle mien. He was a member of the Chelsea Clinical Society and contributed to its *Transactions*. He was also interested in medico-legal subjects, and on these and other matters his name appeared not infrequently in the correspondence columns of this *Journal*. Westminster will miss an excellent doctor and an engaging public figure.

MARY GORDON, L.R.C.P.&S.

We regret to announce the death on May 5 at Crowborough of Dr. Mary Louisa Gordon at the age of 79. She was a woman of great public spirit and independence of mind, and widely acquainted with penal methods and their results.

She studied at the London School of Medicine for Women, obtained the Scottish triple qualification in 1890, and after varied experience in social medicine and the treatment of alcoholism was appointed in 1908 H.M. Inspector of Female Prisons and assistant inspector of the State and Certified Inebriate Reformatories. For some months during the last war she served with the Serbian Transport Column in Macedonia. On retiring from official duties Dr. Mary Gordon summarized her experiences and gave earnest expression to the conclusions she had reached in a book published in 1922 under the title of *Penal Discipline*. Vigorous, racy, at times poetical in language, and throughout imbued with an active living sympathy for the derelict and diseased, it was the work of one who sees her fellow man or fellow woman even in the most abandoned criminal or "old lag." Those who had breathed the prison official atmosphere for any length of time and who knew anything of the author were not surprised to read that at her first round of inspections she unwittingly provided a sensation in several prisons, and also that, as an official, she feared she was never true to type. The book, however, was not a criticism of officialdom but of the prison system, and of its principle of penal discipline which was not made by the administrative body but by the citizens and voters of this country. Dr. Mary Gordon found nothing good in the prison system of her time, and implied, without explicitly saying so, that she looked upon the criminal as a sick person and not as a wrongdoer. The argument of her book was really for a changed public attitude towards the criminal, who should be treated scientifically but neither punished nor reproached. Long before *Penal Discipline* was published she had written a paper on the drug treatment of the inebriate, and she contributed the chapter on the inebriate derelict to the volume *Human Derelicts*.

THOMAS JASON WOOD, M.D., M.R.C.S.
Consulting Surgeon, Bradford Royal Infirmary

We regret to announce the death, which took place at Bradford on May 9 after an operation, of Dr. Thomas Jason Wood, a well-known consulting surgeon in the West Riding of Yorkshire.

He was born at Sevenoaks in 1866, and was educated at Bishop's Stortford School and University College Hospital. In 1890 he qualified M.R.C.S., L.R.C.P. and graduated M.B.Lond.; he took the M.D. degree in 1892. At U.C.H. he worked under the late Christopher Heath, and held the post of senior obstetrical assistant, afterwards acting as R.M.O. at Swansea Hospital. In 1895 he went to Bradford and entered into partnership with the late Dr. Mossop as a general practitioner, and in the same year he was appointed to the assistant staff of the Bradford Royal Infirmary, being promoted to the full staff in 1900. He retired from the full staff in 1923 and was appointed honorary consulting surgeon. During the 1914-18 war he acted as surgeon to the Bradford War Hospital (St. Luke's). He was a past-president of the Bradford Medico-Chirurgical Society and a past-chairman of the Bradford Division of the British Medical Association. During the Annual Meeting of the B.M.A. at Bradford in 1924 he was a vice-president of the Section of Surgery. He continued in practice as a consulting surgeon till ten years ago, when he retired. His hobbies were shooting, fishing, and golf, in all of which pursuits he showed considerable skill.

As a surgeon Dr. Jason Wood had a flair for diagnosis, especially abdominal diagnosis, and this was at a time when the ancillary diagnostic services were in their infancy. His anaesthetist says that he can hardly call to mind an occasion upon which Jason Wood opened an abdomen unnecessarily. As a man, to those who did not know him, he appeared to be austere and abrupt, but to his intimate friends or to anyone in real trouble he was kindness and consideration itself. He was honest and straightforward, but could not suffer fools gladly. In all that Jason Wood did, whether work or play, he was a true sportsman, and to the time of his death he took the greatest interest in the welfare and management of the Bradford Royal Infirmary. He is survived by his widow and two sons and three daughters.

Many friends (writes R. M.) will mourn the passing of a fine gentleman by the death of Dr. RICHARD KELLY, who for many years was one of Arbroath's most-sought-after and successful medical practitioners. Bournemouth, where he spent his later

years, has lost an ardent admirer and a picturesque personality. Two decades ago Dr. Kelly came south in retirement from a strenuous and exacting professional life, which had taken its toll of health and strength. He soon found that in the surroundings of his beloved Bournemouth health and vigour were restored and life began again to be joyous and worth-while. In his professional capacity Dr. Kelly had the gift of imparting confidence and reassurance while, at the same time, he was a great assessor of the verities behind his patients' condition He added to his methodical and painstaking nature a high endeavour to keep abreast, despite a busy life, with the varying and advancing research and technique of his profession He had been a member of the British Medical Association for fifty-two years and to the last was a faithful reader of the *British Medical Journal*.

One of the few nonagenarians in the medical profession has passed away with the death of DR. PHILIP LANCASHIRE BOOTH of Barrow-in-Furness. Dr. Booth was born in Manchester in 1849 and received his education at Owen's College. He qualified M.R.C.S. in 1873, and in the following year was appointed house-surgeon at North Lonsdale Hospital, Barrow, then a very unpretentious wooden building, and now a modern hospital of 154 beds. Very soon he bought a practice and settled down in that town, which was then rapidly developing as a mining and industrial centre, and there and on the adjacent island of Walney he practised for not far short of seventy years. Dr. Booth was a member of the British Medical Association from 1877 onwards, and was chairman of the Furness Division in 1932-3. But he had no ambition to be other than a local medical practitioner, serving the North Lancashire folk whom he knew so well. He was honorary surgeon to the North Lonsdale Hospital down to his death. His only outside interests were in Freemasonry, in which he attained high Provincial rank, and choral societies and church choirs, in which he took an active part from boyhood right into old age. It is possible that he was the oldest doctor in practice in England.

DR. CHRISTABEL LILIE MARGARET GWYNNE-JONES (née Charlesworth) was killed by enemy action in one of the recent air raids on Plymouth. She was the wife of Surgeon Commander T. Gwynne-Jones, R.N., who seems to have been on duty in Devonport Dockyard at the time and so escaped. Her maid, Dorothy Remick, was killed at the same time. Dr. Christabel Gwynne-Jones was educated at Glasgow University, where she graduated as M B. and Ch.B. in 1921, and at King's College, London, also taking the M.R.C.S. and L.R.C.P. diplomas in the same year.

Universities and Colleges

UNIVERSITY OF OXFORD

Miss Ida Mann, D.Sc., M.B., F.R.C.S., has been appointed to the Margaret Ogilvie Readership in Ophthalmology from October 1.

UNIVERSITY OF CAMBRIDGE

At a Congregation held on May 12 the following medical degrees were conferred:

M.B., B.CHIR.—By Proxy: D. Laing, E. J. C. Kendall.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh, held on May 14, with Dr. H. M. Traquair, President, in the chair, the following, having passed the requisite examinations, were admitted Fellows:

G. J. Cleland, G. J. A. Kirkpatrick, F. B. Korkis, J. C. Milne, D. M. Nundy, Marion A. Pearson, O. McC. Spence, W. J. Watt.

The Henry Arthur Dalziel Ferns Bursary was, after a competitive examination in organic chemistry in its application to medicine, awarded to Mr. N. Meleca.

The Ivison Macadam Memorial Prize was, after a competitive examination in inorganic and organic chemistry in its application to medicine, awarded to Miss Mary McDonald.

The Bathgate Memorial Prize was, after a competitive examination in materia medica and therapeutics, awarded to Mr. E. D. Cameron.

Medical Notes in Parliament

Medical Man-power and Alien Doctors

The question of the Government's treatment of alien doctors in relation to medical man-power was raised by Sir HENRY MORRIS-JONES in the House of Commons on May 13. He contended that there had been a good deal of chaos and muddle in dealing with the matter. Last January there were 1,400 alien doctors in this country, and roughly only 100 had found employment. The fault lay with the multiplicity of Government and Service Departments and Refugee Committees. The Central Medical War Committee had an inadequate staff to deal with the matter, and he was told that there was only one official to deal with this question at the moment. There was also serious delay at the Aliens Department of the Home Office, which was causing a hold-up. This Department was the bottle-neck. It would take three years to absorb these alien doctors at the present rate. Some hospitals had appointed alien doctors, as they could not get other medical assistance, and sometimes it had taken two months to get sanction from the Home Office to do this. It was now announced that we were to take 1,000 American doctors into the R.A.M.C. While he believed in Anglo-American co-operation, we should not shout from the housetops about asking them to come here and then do an injustice to those who had been here for so long. We should not discourage these American doctors by putting them into the R.A.M.C. to clean instruments for a few hours a day, but should see that their skill was made use of in the best possible way. Our medical man-power was very badly distributed at present, and in rural areas it was often impossible to find a medical man to attend even a confinement case. The R.A.M.C. seemed, owing to the peculiar character of the war, to have an avaricious appetite for medical personnel, although there was not much work for them to do. The Central Medical War Committee had done very valuable work in the war, but the whole question had now got beyond them. The Minister of Health ought to take the matter into his own hands and appoint committees in each county or each county borough of over 250,000 population. The committee should comprise a representative of the British Medical Association, a responsible public man from the county, and representatives of the trade unions and employers.

Sir FRANCIS FREMANTLE pointed out that the Central Medical War Committee was set up by agreement with independent bodies like the Royal Colleges of Physicians and Surgeons, and direct representation was given to those bodies. It was probably the most representative body of the medical profession that could be got. It was obviously a great deal better for a question like this to be dealt with by the profession as a whole than to be taken over by a Government Department. The Central Medical War Committee was as conscious of the difficulty of the alien doctors as anyone else, and was as keen as Sir Henry Morris-Jones to use these people. There was no lack of good will—certainly not consciously. With regard to the suggestion that the Ministry of Health should take over the whole of the work and appoint local committees, he pointed out that Local Medical War Committees already existed in each area, which gave up their time to the very unpleasant work of deciding among their own colleagues whom they would root out from their practice and compel to serve. Continuing, he said it was not so easy as it might seem to employ alien doctors. Most of them could not talk English or, if they did, it was broken English. It was very difficult for them to understand the ways of the British medical profession and still more difficult to understand British patients in order to prescribe for them. It was difficult for them to use the organization to which they were to be appointed and the conditions and circumstances in which they had to recommend the application of their advice to their patients.

Prof. A. V. HILL said that we had been unexpectedly fortunate so far during the war in the matter of our public health, but we must not assume that our present good fortune would necessarily continue. Britain's medical resources were taxed to the utmost. In ordinary times we might have enough doctors as we were organized—that was, for dealing with disease only; but we should not have more than from one-third to two-thirds of the doctors wanted if health were to be regarded

as the essential thing and not the treatment of the disease only. In wartime, even more than in peace, we had to think ahead We knew that 3,000 deaths from diphtheria and 60,000 cases annually could be abolished if only we could think ahead, if the Government and the people were not so complacent, and doctors were available to carry out the necessary immunization. If we were to avoid disease then far more doctors were required. For this reason we could only welcome with gratitude the promise of the United States to send 1,000 doctors to help us. It was appalling that we should have 1,300 doctors from Europe unemployed of the 1,400 available. The story that our people would not accept these doctors and that the hospitals did not want them seemed to him to be nonsense. Many Czech doctors spoke English well and had great professional knowledge and skill. The people who raised these objections were often disguising their own prejudices by referring them to the common people. Actually, little objection to the employment of alien doctors was openly voiced by the medical profession and practically no objection by our people.

GOVERNMENT REPLY

Miss HORSBRUGH, replying to the debate, said that in the employment of alien doctors they had to make certain that the doctor had skill and that his training was what he professed it to be. If he was to go into the hospitals it was natural that one must check these things. We had also to check that he was loyal to this country. The arrangement by which Allied doctors would be welcome to serve in our hospitals had been working for about four months. She did not say that the number already employed was satisfactory, because she thought the machine had got into action too slowly. She believed that the number of alien doctors was 1,350 and that now 200 or 250 were being employed. Fifty-nine doctors obtained employment at a hospital first and then their credentials were checked. The names of 333 were sent in to the Security Department and arrangements were made for 224 of that number. Then 126 were registered with the General Medical Council and she thought they were in employment, while 98 remained in the pool that had now been created. Their bona-fides had been examined and they were awaiting employment. The main scheme had been slow, but we had increased the pace, and the numbers now coming through from the Home Office Department were at the rate of about 100 a week. A great many were specialists, and it was not always possible to employ them in their own specialty. Doctors were wanted most for junior positions in a hospital, but some of them would not be suitable for such posts. Others, by reason of part-time work and studies, could not give their whole time. The Ministry was very anxious that they should be employed.

She welcomed the 1,000 doctors coming from America. While the Army was in this country and troops were stationed in a particular town and had no R.A.M.C. doctors they could be attended by the local practitioners. But at any moment the troops might leave the district, and the personnel of the R.A.M.C. must be sufficient to provide for the troops when they had to move. It was not necessarily the case that the majority of the alien doctors could not speak English. A great many of them, however, could not, and one of the difficulties might be that of language if the foreign doctors were used as we hoped to use the American ones. Those who did not speak English, as well as others, found it far easier to work in the hospitals with doctors who could assist them. The trouble in dealing with alien doctors was not complacency, but perhaps a machine that had worked too slowly. The checking up had been slow, but it was a great deal better to be slow than to make a mistake as to a doctor's skill or his loyalty to the country. She hoped that the numbers of alien doctors to be employed would be 100 a week and perhaps increased to 150.

Medical Certification

On May 15 Mr. CULVERWELL asserted that absenteeism and the transfer of labour were facilitated by the ease with which medical certificates could be obtained. He asked Mr. Bevin to ensure that doctors granted such certificates only for genuine cases of sickness or physical disability. Mr. BEVIN said he received representations on the ease with which medical certificates were alleged to be obtainable in certain cases. He proposed to consult Mr. Ernest Brown on the matter. In his Department certificates given by medical practitioners in their private capacity were not necessarily accepted as conclusive. An independent medical examination was required when this seemed necessary. Mr. CULVERWELL asked Mr. Bevin to secure the co-operation of the British Medical Association in checking "this abuse." He also asked him to ensure wide publicity for his reply. Mr. SHINWELL asked Mr. Bevin to go into the matter carefully in view of the slur cast on the workers.

Mr. BEVIN replied that he was going into the matter. Under the Essential Work Order it was possible to test the facts. He was satisfied there was at least *prima facie* evidence that, in giving panel certificates, there had not been the care which ought to have been exercised. The genuineness of any medical certificate could be examined by the Ministry of Labour. He reminded the House that constant building up of more forms of medical boards involved a great deal of organization for what might be a comparatively few cases. In his view the medical profession, "like every other trade union," ought to accept their responsibilities. Sir FRANCIS FREMANTLE said the medical profession was not a trade union and had never been.

Horseflesh in Popular Foods

Mr. ERNEST BROWN said on May 13 that to some extent there was an admixture of horseflesh with beef in various articles of popular consumption. Apart from the general provisions of the Food and Drugs Act, 1938, for the protection of purchasers, including those relating to labelling, the Act contained detailed provisions relating to the sale of horseflesh and articles of food containing it, the administration of which was a matter for the local authorities.

Differential "Iron Rations."—Major LLOYD GEORGE, replying to Miss Rathbone on May 7, said he and his advisers had not worked out, in terms of the available commodities, the minimum "iron rations" necessary to sustain in full health and efficiency heavy workers, adults other than heavy workers, children, and infants, respectively. It was the considered policy to allow the maximum possible ration to all rather than differential rations to particular categories. He was satisfied that the diet that could be obtained under existing conditions was adequate. Difficulties of distribution would be insuperable if the rationing system were calculated to ensure that everyone could secure the approximate equivalent of his appropriate iron ration and no more. He added that plenty of information on iron rations was available in the Ministry of Food.

The Services

ARMY AWARD

The D.S.O. has been awarded to Lieut. (Temporary Captain) Thomas Victor Somerville, R.A.M.C., and he has also been mentioned in dispatches for distinguished services in the Middle East.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

The death is announced of Surgeon Lieut. JOHN MORTIMER WATSON, R.N.V.R., the younger son of Dr. and Mrs. H. A. Watson of Worcester, at the age of 27. He received his medical education at King's College Hospital and qualified M.R.C.S., L.R.C.P. in 1938. He had held the post of senior resident medical officer at the Royal Buckinghamshire Hospital, Aylesbury, and was house-surgeon at King's College Hospital.

Surgeon Lieut. GEORGE THEODORE ROBERTSON WATT, R.N.V.R., was killed by enemy action when his ship, H.M.S. *Wryneck*, was sunk in the Aegean Sea during the recent evacuation from Greece. He was the eldest son of Dr. Theodore Watt and was educated at Aberdeen Grammar School and at the University of Aberdeen, where he graduated M.B., Ch.B. in 1936. After qualifying he held resident posts at Aberdeen Royal Infirmary, Mount Vernon Hospital, Northwood, Aberdeen Maternity Hospital, and at the Jessop Hospital for Women, Sheffield. He joined the R.N.V.R. in June, 1940, when he was posted to the destroyer *Wryneck*. He had been a member of the British Medical Association since graduation.

DEATHS IN THE SERVICES

Colonel WILLIAM SOUTHWICK WILLMORE, I.M.S. (ret.), died suddenly at Churt, Surrey, on May 3, aged 68. He was born on August 7, 1872, was educated at Birmingham and at St. Thomas's Hospital, and took the M.R.C.S., L.R.C.P. in 1895. Subsequently he took the D.T.M. and H. in 1907, the M.R.C.P. in 1908, and the M.D. of Durham in 1913. After qualifying he held several house appointments at Queen's Hospital, Birmingham. He entered the I.M.S. as lieutenant in 1899, attained

the rank of full colonel in 1927, and retired in 1929. Most of his service was spent in the United Provinces in civil employ, which he entered in 1903. In 1914 he was civil surgeon of Agra and principal of Agra Medical School. In October, 1914, he reverted to military duty and served with the Army until January, 1920. He was appointed professor in King George's Medical College, Lucknow, in 1922, and in 1923 civil surgeon of Cawnpore. On promotion to administrative rank in 1927 he became Inspector-General of Civil Hospitals in Bihar and Orissa, where he remained until he retired, after which he settled at Felsted in Essex, and was consulting physician to Felsted School. He served in the China War of 1900, when he took part in the relief of Peking and in the actions at Peh-tsang and Yangtsun, receiving the medal with a clasp. He had been a member of the British Medical Association for forty years and was chairman of the Mid-Essex Division in 1937.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The incidence of the common infectious diseases in England and Wales, with the exception of whooping-cough, showed only slight variations from that of the previous week. In Scotland the notifications of whooping-cough and dysentery have increased 100%, and a considerable increase has occurred in the incidence of cerebrospinal fever and typhoid fever. The number of cases of measles has declined by 68 for the whole country, but the returns for the individual counties showed some fluctuations: from Durham, Kent, and London over a hundred more cases were recorded than in the preceding week. The incidence of scarlet fever decreased by 35 cases during the week under review and the notifications were the lowest since last summer. A slight increase, 35, in the number of cases of diphtheria was reported in England and Wales. With the small decrease, 9, in the returns for Scotland the incidence of this disease reached the lowest level of recent months. The relatively large increase in enteric fever in Scotland, from 45 to 75 cases, was due to an outbreak of paratyphoid fever in Dundee, where 55 cases were reported during the week.

Whooping-cough

A general rise in the incidence of this disease is recorded for the week under review. In England and Wales 4,187 fresh cases were notified, an increase of 619, and in Scotland 549 cases, an increase of 330. In England and Wales the increase was distributed over the whole country, the largest rises being in Surrey, Lancashire, and York, West Riding, where the totals were respectively 79, 70, and 69 in excess of those of the preceding week. Whooping-cough is not generally notifiable in Scotland, and the returns are dominated by the experience of Glasgow, which contributed four-fifths of the total cases notified in the country.

Dysentery

For the third consecutive week the number of notifications of dysentery in England and Wales has shown a fall. Only 8 further cases were recorded in the Hertfordshire outbreak, but another rise occurred in Whiston R.D., Lancs, where 15 fresh cases were notified. In Scotland the number of cases of dysentery was doubled, 63 compared with 32 in the previous week: 24 of the cases were reported from the county of Argyll, and the cities of Aberdeen and Glasgow contributed 11 and 8 cases respectively.

Cerebrospinal Fever

There was a slight decrease, 17, in the notifications of this disease in England and Wales during the week. The general trend of this disease during the past seven weeks has been to oscillate round a constant level. The rate of decline in the ten weeks following the maximum has been less than that experienced in the epidemic of last year. Isolated cases of cerebrospinal fever were reported from all over the country, but half of the total cases were from only five counties—Lancaster 34, London 22, Warwickshire 18, Yorks W.R. 39, and Glamorganshire 20. The returns for Scotland showed an increase for the second consecutive week and the total reached the level recorded in March. The largest outbreaks were those of Glasgow, 32 cases, and Edinburgh, 11 cases.

No. 17

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended April 26.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 15 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 11 principal towns in Northern Ireland.

A dash — denotes no cases: a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	1941 (b)	1941 (c)	1941 (d)	1941 (e)	1940 (Corresponding Weeks) (a)	1940 (Corresponding Weeks) (b)	1940 (Corresponding Weeks) (c)	1940 (Corresponding Weeks) (d)	1940 (Corresponding Weeks) (e)
Cerebrospinal fever	309	22	97	4	9	385	33	72	4	3
Deaths		2	5				5	4		
Diphtheria	912	40	213	23	26	680	37	224	44	25
Deaths	27	1	4	3	2	21	—	7	3	1
Dysentery	106	18	63		—	42	—	44		1
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	6	1	1	1	—	6	1	—	—	—
Deaths		1	—	—			1	2	—	
Enteric (typhoid and paratyphoid) fever	26	—	75	5	—	37	5	8	3	—
Deaths	1	—	—	—		1	—	—	—	—
Erysipelas			54	8	4			62	5	4
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years										
Deaths	31	5	8	8	1	26	6	10	6	3
Measles	13,383	423	126		4	4,568	38	365		142
Deaths	10	2	—	—	—	2	—	1	3	1
Ophthalmia neonatorum	81	3	12		—	90	9	17		—
Deaths										
Pneumonia, influenzal*	1,095	48	16	9	3	925	69	5	12	5
Deaths (from influenza)	37	2	1	1	—	41	7	4	1	3
Pneumonia, primary			260	12				248	12	
Deaths		—		11	11		41		15	15
Polio-encephalitis, acute	2	1				2	—			
Deaths		—					—			
Poliomyelitis, acute	6	—	3		—	4	—	—		—
Deaths		—	—				—	—		
Puerperal fever	2	2	15	1	—	2	2	24	1	—
Deaths		—					—			
Puerperal pyrexia	121	3	15		4	170	13	30		2
Deaths										
Relapsing fever	—	—			—	1	—			—
Deaths										
Scarlet fever	1,021	—	117	47	25	951	35	130	57	52
Deaths	1	4	—	—	—	1	—	—	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	1	—	—	—	—	—	—
Deaths	—	—	—	—	—		—	—	—	—
Whooping-cough	4,187	114	549		7	644	15	42		7
Deaths	32	2	15	1	—	71	1	11	4	1
Deaths (0-1 year)	337	32	83	27	25	416	51	77	40	45
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	6,773	1,793	698	228	432	5,225	844	725	237	187
Annual death rate (per 1,000 persons living)			15.2	13.8	43.2			13.1	15.3	16.4
Live births	5,258	398	914	396	257	6,550	997	960	377	279
Annual rate per 1,000 persons living			18.6	25.7	20.3			19.2	24.3	24.5
Stillbirths	229	13	30			256	31	41		
Rate per 1,000 total births (including stillborn)			32					41		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Medical News

Those who are interested in the Near East and in medical international work are invited to the forty-second annual meeting of the Lebanon Hospital for Mental Diseases, Syria, on Thursday, June 5, at 4.15 p.m., in the garden lounge of the Westway Hotel, Endsleigh Street, London, W.C. The speakers include Mrs. Somerville Smith, representative in London of the British-American Ambulance Corps, and M. Mathieu, formerly interpreter at the League of Nations, who will speak on the situation in Syria.

The seventy-fifth anniversary of the founding of New York City Department of Health was observed on March 5, when the speakers were Mayor La Guardia, Drs. John L. Rice, health commissioner, Haren Emerson, and Jones Alexander Miller. Seventy-five years ago the general death rate was 35 per 1,000 of population and the infant mortality 245 per 1,000 live births. Last year the death rate was 10.3 and the infant mortality 35.

The sixty-fourth annual meeting of the American Dermatological Association was held at New Orleans from April 7 to 10. The proceedings included a clinical session at the National Leprosarium at Carville, Louisiana, which gave an exceptional opportunity for the study of leprosy. After the presidential address by Dr. William H. Guy twenty-two miscellaneous papers on clinical and pathological aspects of skin diseases and syphilis were read and discussed on the first, second, and third days. The final scientific session was given up to a symposium on superficial fungous infections. A report on the effects of copper sulphate iontophoresis in a series of cases of fungous infection of the skin showed the failure of such treatment to act as a fungicide. A report on the preparation and clinical application of undenatured trichophytin indicated that this is a satisfactory antigen for diagnostic and therapeutic purposes. Another report suggested that there were two separate factors in trichophytin: one a skin reactivity factor, and the other a desensitizing or therapeutic principle. There was also a report of an analysis of fungi found on the feet and in shoes in dermatophytosis, and a statistical analysis of eighty-eight replies to a questionary on familial and conjugal transmission of two common forms of fungous infections of the glabrous skin.

The Minister of Food has made an Order, to come into force on June 2, prohibiting, except under licence, the manufacture or sale of vitamin C. The Order does not apply to the manufacture or sale of vitamin C for medicinal, pharmaceutical, or scientific purposes. Applications for licences should be made to the Ministry of Food, St. John's College, Oxford.

The names of Dr. Richard Arden Jones, Emergency Medical Service, Newmarket, and Dr. William Thomas Garthorpe Boul, medical officer of health, Civil Defence Services, Thurrock, have been brought to notice for brave conduct in civil defence.

BATTERIES FOR THE DEAF

The Board of Trade announces that arrangements have been completed for the manufacture of an adequate supply of high-tension batteries to meet the needs of deaf persons who use hearing aids. Owing to Service requirements of batteries, it has, however, been found necessary to curtail considerably the number of different types of these batteries, and manufacture will be restricted to an agreed range of standard types.

The new types have been designed to cover the requirements of all existing United Kingdom makes of hearing aids which employ high-tension batteries, but it may be found that some instruments will need minor modification in order to accommodate them. In general, it will be found that the new batteries are rather larger than those formerly in use, but every endeavour has been made to ensure that alterations to instruments, where necessary, shall be of a minor character and confined to the battery casing only. No modifications will be required in the mechanism of any instrument. Users of hearing aids are advised to communicate with the manufacturers of their apparatus, who will inform them of the most appropriate new types of battery and of any modifications to their sets which may be necessary.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Income Tax

Annuity Policy

"FRANCIS" has "for a number of years" paid £86 for an annuity payable at sixty-one. Is he entitled to any allowance?

* * The answer is No, unless the policy (*a*) was taken out on or before June 22, 1916, or (*b*) was "made in connexion with any superannuation or bona-fide pension scheme for the benefit of the employees of any employer or of persons engaged in any particular trade, profession, vocation or business."

Service in Forces Abroad: Wife's Income

"PERPLEXED" has been abroad on naval service and is regarded as "non-resident" for the years 1938-9 and 1939-40. His wife was also abroad, and her income, though not liable to British income tax, has to be brought into the computation of "Perplexed's" proportionate liability on his naval pay. Is this correct?

* * Apparently it is. It may not follow that "Perplexed" is worse off because he is regarded as a non-resident if (as may be the case) his own residential circumstances might be taken into account in deciding whether his wife is to be regarded as a non-resident for the years in question. Tax on her income would far outweigh the present loss. In the circumstances "Perplexed" is advised to await the result of his plea for reconsideration on equitable grounds.

Motor Car—Replacement Allowance

"N. F." bought a car in 1934 for £505 and sold it in 1939 for £47, buying a small car for £174. No depreciation allowance has been claimed. The inspector of taxes now proposes to allow only £174 − £47 = £127—i.e., the actual out-of-pocket expense. Is this correct?

* * Yes. Depreciation should be claimed each year, because the lump sum claim cannot exceed the net cost of the replacement. We advise "N.F." to lodge a claim to reopen the past six years' assessments on the ground of an error or mistake in his past returns—i.e., the omission to claim depreciation allowance. But if the omission was deliberate the claim is not a good one.

LETTERS, NOTES, ETC.

Nitrous Oxide for Dental Anaesthesia

THE BRITISH OXYGEN COMPANY LIMITED write: We would refer you to Mr. B. Richardson Billings's letter (April 19, p. 608), in which he states that he has been "driven to the conclusion that the war product differs considerably in its effects (and possibly in its method of production) from pre-war nitrous oxide." As the manufacturers of practically the total consumption of nitrous oxide in the country we should like to state that there is no difference whatever in the quality as compared with pre-war days. Certain manufacturers of quality products may, in wartime, have difficulty in securing a regular supply of first-grade raw materials and are therefore unable to maintain their high standards, but in the case of the manufacture of nitrous oxide no such difficulties have arisen, and we make the definite statement that our high standard of purity is comparable with pre-war production. When practitioners are not obtaining the best results we find on most occasions that a minor adjustment to their medical apparatus remedies matters.

Corrigendum

Dr. JAMES REID wishes to draw attention to an error in his article on "Prothrombin Deficiency in Disease of the Liver and Bile Passages" (*Journal*, April 19). On page 580, column 1, line 5, "M/10 calcium chloride solution" should have read "M/40 calcium chloride solution."

SUPPLEMENT TO THE
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£78 9s. 6d.—Per Dr. J. Inglis Cameron, Glasgow Division (amount already sent, £265 13s. 6d.): Dr. James Dunlop, £5 5s.; Dr. B. McCall Smith, £5 5s.; Dr. A. S. Peel, £5 5s.; Dr. J. F. Lambie, £5 5s.; Dr. T. P. Hutchison, £5 5s.; Dr. J. Pearson, £5 5s.; Dr. A. J. Ballantyne, £5 5s.; Dr. W. S. Aitken, £5 5s.; Dr. T. S. MacDonald, £5 5s.; Dr. J. H. MacDonald, £3 3s.; Dr. J. Whiteside, £3 3s.; Dr. A. Scarman, £2 2s.; Dr. W. Templeton, £2 2s.; Dr. M. Jeels, £2 2s.; Dr. J. McIlwaine, £2 2s.; Dr. M. White, £2; Dr. T. Poole, £2 2s.; Dr. A. Mellor, £2 2s.; Dr. S. Natalin, £2 2s.; Dr. J. W. Turner, £2 2s.; Mrs. M. Stevenson, £2 2s.; Dr. G. Kramer, £1 1s.; Dr. G. B. Burnett, £1 1s.; Dr. J. Meason Pearson, £1 1s.; Dr. A. M. Keith, £1; Dr. A. W. Sutherland, £1; Dr. A. G. Vallance, 10s.
£72 17s.—Practitioners in Durham Division—per Dr. G. Wilson: Dr. J. M. Hat, £10; Dr. J. Jack, £10; Anonymous, £10; Dr. P. F. T. Hare, £10; Dr. H. Rowe, £10; Dr. Munro, £5 5s.; Dr. Ian McCrae, £5 5s.; Dr. G. Wilson, £5 5s.; Dr. J. W. Dickinson, £5; Dr. Susan McMahon, £2 2s.
£56 3s.—Practitioners in Grimsby Division—per Dr. T. J. T. Wilmot: Dr. V. G. Best: £3 3s.; Dr. J. Cottrell, £3 3s.; Drs. Hood and Hampson, £3 3s.; Dr. F. H. Rotherham, £2 2s.; Dr. G. W. Stanley, £1 1s.; Dr. E. H. Robins, £1; Dr. T. Barrowman, Sen., £2; Mr. R. G. Pulvertaft, £3 3s.; Dr. H. S. Virtue, £2 2s.; Dr. M. C. Lavin, £3 3s.; Mr. N. J. Nicolson, £2 2s.; Dr. E. W. Fawssett, £1 1s.; Dr. P. R. Russell, £2 2s.; Dr. A. M. Wolpe, £1; Dr. E. J. Thomson, £1 1s.; Drs. J. Williamson and McKerchar, £2 2s.; Dr. B. Morton, £3 3s.; Dr. J. T. Wilmot, £3 3s.; Dr. James Scott, £2 2s.; Mr. C. L. Granville Chapman, £2 2s.; Drs. E. G. J. and J. F. McCulloch, £4 4s.; Dr. J. Wilkinson, £1 1s.; Dr. F. W. Tebbs, £2 2s.; Drs. S. W. Swindells and F. Martyn, £4 4s.; Dr. T. Barrowman, Jun., £1 1s. (The cost of collection was 7s.)
£53 11s.—Practitioners in Bradford—per Mr. Donald Watson (amount already sent, £429 7s.): Dr. W. Messer, £10 10s.; Dr. J. J. Buchan, £5 5s.; Mr. W. H. G. Mackwood Line, £5 5s.; Mr. G. W. Watson, £5 5s.; Dr. E. W. N. Wooler, £5 5s.; Dr. A. M. A. Price, £5 5s.; Dr. A. V. Gargastan, £3 3s.; Mr. R. M. Hill, £3 3s.; Dr. W. J. McCracken, £3 3s.; Dr. Geoffrey Pearman, £2 2s.; Dr. J. Henry, £2 2s.; Dr. D. W. N. Blackmore, £2 2s.; Dr. A. J. MacCallum, £2 2s.; Dr. R. Garside Dixon, £1 1s.; Dr. J. S. Sergeant, £1 1s.; Dr. H. Frost, £1 1s.
£52 3s.—Practitioners in Scunthorpe Division—per Dr. J. R. Baker: Dr. J. F. O'Sullivan, £1 1s.; Dr. S. L. Swartz, £1 10s.; Dr. J. S. Topping, £10; Dr. A. W. Marrison, £5; Dr. J. S. Budding, £1; Dr. A. C. Thomson, £2 2s.; Drs. Kirk, Birtwhistle, Gilmour, and Tippett, £4 4s.; Dr. R. H. Emerson, £3 3s.; Drs. Stanford, Stanford, O'Connor, and O'Beirne, £6 16s.; Dr. T. Cullen, £3 3s.; Dr. G. W. Williams, £2 2s.; Drs. Lucy and J. R. Baker, £6 6s.; Dr. A. Macbeth, £2 2s.
£24 19s.—Practitioners in West Norfolk Division—per Mr. J. Lewin (amount already sent, £129 6s.): Dr. F. A. Unwin, £5 5s.; Sir Frederic Watson, £5 5s.; Dr. L. Green, £2 2s.; Dr. W. H. Fisher, £1 1s.; Dr. L. Johnson, £3 3s.; Mr. S. T. Parker, £2 2s.; Dr. W. E. H. Ball, £5; Dr. G. M. Flemming, £1 1s.
£22 1s.—Practitioners in Buckinghamshire—per Dr. R. W. McConnel (amount already sent, £248 14s.): Dr. F. D. Murphy, £5 5s.; Dr. E. L. Elliott, £5 5s.; Dr. P. C. Parr, £2 2s.; Dr. W. G. Robson, £1 1s.; Dr. O. A. Biker, £7 7s.; Dr. G. H. Gibson, £1 1s.
£13 13s.—Practitioners in the area of the Cardiff Division—per Dr. F. Y. Pearson (amount already sent, £349 7s.): Dr. James Beatty, £10 10s.; Dr. D. G. Williams, £3 3s.
£8 8s.—Practitioners in the Trowbridge Division area—per Dr. A. C. Mowle (amount already sent, £45 10s.): Dr. M. Pitcairn, £2 2s.; Mr. R. W. Graham-Campbell, £4 4s.; Dr. O. D. Gilmore, 10s. 6d.; Dr. J. C. Byrne, £1 1s.; Dr. J. G. Thomas, 10s. 6d.
£7 7s.—Practitioners in area of Doncaster Division (amount already sent, £11 10s.): Dr. F. W. Johnson, £5 5s.; Dr. W. Thomson, £2 2s. Cleveland Division.—Per Dr. G. H. Isle of Man—per Dr. Kenneth Dr. W. S. Dickie, £2 2s.; Drs. Body, Merchy, and Dickson, £2 2s.; Dr. H. M. McGill, £1 1s.; Dr. Harold Walker, £2 2s.
£5 5s.—Practitioners in Exeter—per Dr. W. A. Robb (amount already sent, £164 2s.): Dr. J. E. Finlay.
£5.—Practitioners in Salisbury Division area—per Dr. H. H. Clarke (amount already sent, £2 2s.): Dr. L. E. Tracey.
£3 3s.—Donations in the Isle of Man—per Dr. D. Parnin (amount already sent, £44 2s.): Dr. G. B. D. McGeagh, Northants Medical Charity—per Dr. D. G. Greenfield (amount already sent, £475 8s. 6d.): Mr. A. R. Bingham.
£2 2s.—Medical Practitioners in Lanarkshire—per Dr. E. G. Y. Thom (amount already sent, £83 19s. 3d.): Mrs. A. B. Wright. Per Dr. O'Driscoll, Hon. Secretary, Blackburn Division (amount already sent, £70 3s.): Dr. B. D. Mallick. Per Dr. J. S. Dunne, Welwyn (amount already sent, £11 10s.): Dr. M. G. Murray.
£1.—Per Dr. Mabel Ramsay, Plymouth (amount already sent, £296 4s. 6d.).: Dr. H. C. C. Reid (8th donation).

Local Medical and Panel Committees

£50.—Lincs (Holland): Stoke-on-Trent.
£8 19s. 8d.—Walsall (2nd contribution).
£3 3s.—Clackmannan County (3rd donation).

Total—£24,246 10s. 7d. and £100 3½% Conversion Stock.

Correspondence

Staffing of Hospitals

SIR,—When Dr. Terry Pybus put forward his now famous scheme for a State Medical Service (*Supplement*, March 15, p. 29) he started a train of medical cerebration of an unusual order. Numbers of us, content to earn our living in the bad old way, have suddenly discovered to our consternation that there are some members of the profession wanting a form of medical "new order" after this war is over. We have but to look around at the fruits of the National Health Insurance Acts and other premature offspring of the Public Health Services to make us dread this further infliction on our professional life. If our would-be reformers, including Dr. Pybus, are determined to make a change, then I suggest that they start and evolve a new system of staffing our hospitals. The present system of restricted staffs is archaic, unfair, and wasteful of professional effort, and has given rise to nepotism and medical cliques. This system is even now undermining our medical war effort through its Local Medical War Committees forming a sort of local "Gestapo" from which there is no escape. The only way for the rank and file to break loose

from these organized professional rings, which centre around the staffs of our local hospitals, is to throw open all general hospitals (excluding the large teaching ones) to every practitioner on the *Medical Register*. This is done in most of the more advanced and progressive hospitals of Western Canada and other States of the Commonwealth.

I venture the opinion that the restricted staffing of local hospitals, particularly in the Provinces, has done more to disorganize and break up the profession into antagonizing groups than any other single factor. If we must have competition, then let it be open, fair, and free to all ; let every dog have a bite.—I am, etc.,

Bournemouth, May 12. VINCENT NORMAN.

State Medical Service

SIR,—Many of your correspondents evidently fear that the introduction of a State Medical Service would result in inadequate payment and "sweating" of the medical men forming the Service. In 1912, nearly thirty years ago, the panel system was introduced and a scale of remuneration laid down, a scale even at that time considered unfairly low. Nevertheless, despite all the efforts of the B.M.A., this scale has never been improved upon, the enormous increase that has occurred in the cost of living and the largely increased scale of wages of the working classes notwithstanding. In the same period the emoluments of the Colonial Medical Service—essentially a State Medical Service—have been increased by 50% as a result of representations by the Association to the Colonial Office. The State Medical Service, an organized body with a common interest, is successful in obtaining adequate remuneration, while panel practitioners, lacking that unity, fail in a similar effort. *Verb. sap.*

The excellently equipped research institutes, laboratories, hospitals and medical schools scattered throughout the Colonial Empire are sufficient answer to the fear that State hospitals and clinics must inevitably be ill equipped. Publications such as the *Journal of the Royal Society of Tropical Medicine and Hygiene* and the *East African* and *Malayan Medical Journals* are sufficient index of the professional ability of the "bureaucratic Civil Servants" who constitute the State Medical Service of the Colonies.—I am, etc.,

B. SPEARMAN,
Colonial Medical Service (ret.).

Gillingham, Dorset, May 12.

DOMICILIARY ATTENDANCE ON EVACUATED ADULTS AND ACCOMPANIED CHILDREN

The Ministry of Health has communicated with its Regional Officers on the subject of domiciliary attention for evacuated adults and accompanied children. Some time ago the Ministry advised county councils and county borough councils to extend the district medical service where necessary to provide attention for uninsured evacuated adults unable to pay for treatment and accompanied children. The Ministry has now advised its Regional Officers on the various methods of extending this service, and of an agreement reached with the British Medical Association on remuneration.

One method of extending the service is by appointing new medical officers or by increasing the salaries of existing district medical officers. In these cases the salary depends on the work to be done and must be related to the facts of the individual case. The Ministry's communication relates to proposals to remunerate additional or existing district medical officers otherwise than by salary, or to introduce an open-choice scheme for evacuated persons where such a scheme is not already in operation. In these circumstances the basis agreed between the Ministry and the Association is that of a quarterly payment per patient treated, the method generally in operation in existing open-choice schemes.

The Ministry's Regional Officers have been asked in these circumstances to approve only those proposals which are in conformity with the agreed terms :

(a) Payment should be by a fee per patient treated.

(b) The fee should cover treatment for the period of three months following the first visit or attendance, and should include travelling and the supply of medicine and medical and surgical appliances which are provided by way of medical benefit under National Health Insurance.

(c) The fee should be not less than 7s. 6d. and not more than 10s. 6d. The margin is designed to allow for different types of area—that is, in an urban area the fee would be nearer 7s. 6d.; in a rural nearer 10s. 6d. owing to extra travelling.

(d) Where an illness is so prolonged that it involves *continuous* attention over a period of more than three months the amount of the fee paid should be *four times* the quarter's fee, whether the illness continues for the whole year or not.

Medical Services of H.M. Forces Appointments

ROYAL NAVY

Acting Surgeon Lieut.-Commander F. H. Ward to be Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Acting Surgeon Lieut.-Commander A. I. L. Maitland to be Surgeon Lieutenant-Commander.

To be Temporary Surgeon Lieutenants: J. E. Tillotson, F. Whitwell, R. Rowlandson, S. J. Allen, G. R. Nicks, T. T. Schofield, G. J. Potts, F. H. D. Hutter, N. G. Lindsay, J. N. G. Way, A. C. Mackay, A. J. E. Barlow.

Probationary Temporary Surgeon Lieutenants R. E. Prichard, C. A. Milner, W. G. L. Hall, C. J. Rooke, D. J. MacMillan, A. H. Murray, A. T. Marshall, W. D. Thompson, K. B. Scott, A. Whitewright, W. Phillips, J. L. Temple, A. P. Walker, P. B. Woodyatt, T. P. Griffin, R. F. Lavelle, A. H. Zuckerman, M. C. Wood, C. M. T. Adamson, M. Glick, E. A. Spouse, H. M. Tucker, P. H. Tooley, R. Scott, J. D. M. Barton, R. G. Harcourt, H. G. B. Woollatt, J. K. Thomson, P. A. Walshaw, J. P. G. Rogerson, M. M. Walker, J. Taylor, E. M. Webster, R. Ransome-Wallis, D. H. Davies, J. C. Simson, C. S. Sandeman, J. J. Walker, and J. D. Randall to be Temporary Surgeon Lieutenants.

ROYAL ARMY MEDICAL CORPS

Lieut.-Colonel E. F. W. Grellier, having attained the age for retirement, has retired, and remains employed.

Major (temporary Lieut.-Colonel) T. Young to be Lieutenant-Colonel.

Captain (temporary Major) C. P. Stevens, a Short Service Officer, has been appointed to a permanent commission.

Postgraduate News

The Fellowship of Medicine announces the following courses for (Final) F.R.C.S. candidates: (1) Clinical course, Wednesdays, 2 p.m., July 2 to 23; (2) Revision course, daily, 10 a.m. to 1 p.m., July 7 to August 1; (3) Practical operative surgery course, Mondays, Thursdays, and Fridays, 2 p.m. to 4 p.m., July 7 to August 1.

WEEKLY POSTGRADUATE DIARY

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.—Brompton Hospital, S.W.—Mon. and Thurs., 5 p.m., M.R.C.P. Course in Chest Diseases. West End Hospital for Nervous Diseases.—Tues. and Fri., 5.30 p.m., M.R.C.P. Course in Neurology.

Road, W.—Mon., Course ences. Daily, 10 a.m. to

Paediatric Conferer

Dermatological Clin tion, Dr. Duncan V (Surgical); 2 p.m., Sterility Clinic, Mr.

EDINBURGH POSTGRADUATE Thurs., 2.30 p.m. Dr. G. Ew and Oesophagoscopy in Diag

Royal Infirmary, rachcobronchoscopy

DIARY OF SOCIETIES AND LECTURES

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, W.—Tues., 2.30 p.m. General meeting. Discussion: Venereal Buboes. To be opened by Dr. H. M. Hanschell.

VACANCIES

EXAMINING following vacant appointments are announced: Woodford (Northamptonshire); Crawley (S Chief Inspector of Factories, Queen Anne's Cha W.1, by June 3.

APPOINTMENTS

EXAMINING FACTORY SURGEONS.—W. M. Kirkby, M.R.C.S., L.R.C.P., for the Porthcawl District (Glamorganshire); W. Parry-Jones, M.R.C.S., L.R.C.P., for the Llangefni District (Anglesey).

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

BIRTH

COLEMAN.—On Sunday, May 11, 1941, at Sandford, Llandudno, to Mildred, wife of A. H. Coleman, F.R.C.S., a son (both doing well).

DEATH

THOMSON.—On April 7, 1941, Dr. Bailey Thomson, at Balbegno, Carlton Road, Nottingham.

positive reactions—31 in sixteen hours and 16 in forty hours. Six grew poorly, but on repeating the tests they all grew well and gave strongly positive reactions in forty hours, one requiring a more concentrated inoculum. A further 5 reacted feebly, although they grew well; on retesting with another serum 3 of these reacted strongly but 2 remained weak reactors. In routine practice the colony test was applied to 43 plates directly seeded from wound swabs or dust. Of these, 20 reacted strongly in sixteen hours and 15 in forty hours. Nine grew poorly, but growth was sufficient to give a definite reaction in all but two of them. These two were strongly positive when retested with a drop of broth culture as inoculum.

Incubation and Centrifugation.—Most strains are positive in sixteen or forty hours, and a few require sixty-four hours' incubation; but no change has been observed after sixty-four hours. Strong reactions are obvious without spinning, but the detection of weak reactions and the confirmation of negatives are impossible without a comparison of centrifuged tests and control tubes. It should be noted (see above) that a floating mass of floccules may be changed to a sedimenting precipitate with prolonged incubation of the test mixture.

Reactions with Cl. welchii

Fifty-eight strains have been tested: 3 stock cultures (one each of Types A, B, and C), and 55 recently isolated cultures—51 from wounds in 39 persons and 4 from sand and air. Nine of the wound strains were kindly sent by Dr. E. T. C. Spooner. Of the 46 strains isolated in this laboratory 45 were identified as *Cl. welchii* on morphological, cultural, and biochemical characteristics. Many were tested in guinea-pigs and mice, with antitoxin controls. One strain, even after repeated purification, slowly digested and blackened meat broth persistently, and fermented salicin but not sucrose; it gave typical disease in the guinea-pig and killed a normal but not an antitoxin-treated mouse. Of these 58 strains 56 (96%) gave strong reactions when the growth was good. Two grew well, but reacted feebly with serum from young adults, although they reacted strongly with a senile serum. One of these—beta-haemolytic on horse-blood agar, and pathogenic for guinea-pigs but not mice—reacted strongly with yolk saline. The other was non-haemolytic and non-pathogenic, and reacted feebly with yolk saline. These reactions, though feeble, were definite and were inhibited by antitoxin, but in view of the "specific" reaction by other clostridia cannot be considered as exclusively characteristic of *Cl. welchii*.

Reactions with Other Bacteria

Anaerobes.—Tests have been carried out on 174 cultures of anaerobes other than *Cl. welchii*. These included 67 of the *Cl. sporogenes* type, 6 *Cl. septicum*, 10 *Cl. tetani* of different serological types, 2 *Cl. multifermentans tenalbus*, 1 each of *Cl. botulinum*, *Cl. sphenoides*, *Cl. histolyticum*, *Cl. tetanomorphum*, *Cl. oedematiens*, *Cl. bifermentans*, N.C.T.C. 2914, *Cl. sordellii*, N.C.T.C. 2919, *Cl. parasporogenes*, *Cl. centrosporogenes*, N.C.T.C. 1341, *Cl. fallax*, and *Cl. hastiforme*, 66 not yet fully identified proteolytic anaerobes, 11 not yet fully identified saccharolytic anaerobes which by reason of spore position, colony form, or sugar reactions were known not to be *Cl. welchii*, and an anaerobic coccus. Of these, 165 gave no Nagler reaction, although some gave a slight turbidity in both test and control tubes. The remaining 9 cultures were feebly but definitely positive, the reaction being inhibited by *welchii* antitoxin, and appearing both in yolk saline and in serum. On human serum-Fildes's-agar plates they produced a well-defined opacity extending to a distance of about 2 mm. from the edge of the colony. Two were N.C.T.C. strains—*Cl. sordellii* and *Cl. centrosporogenes*. Seven were recently isolated from wounds; they were all very similar and were most nearly related to *Cl. bifermentans*, although some differed from it in motility, action on Spray's iron milk (1936), and liquefaction of inspissated serum. None fermented the two *welchii* sugars—lactose and sucrose. Although the cultures had been thoroughly purified by alternate broth and plate subcultures, it is possible that the positive reactions were due to contamination with small amounts of *Cl. welchii* whose growth was enhanced in the Nagler test fluid at the expense of the predominating clostridium. Serial subculture in this fluid improved the Nagler reaction to a certain extent, but all attempts to reveal traces of *Cl. welchii* in the subcultures of these strains have so far failed. With all 7 cultures large doses mixed with calcium chloride failed to kill mice or guinea-pigs. On the whole the similarity of these cultures and their persistent non-*welchii* characters in media favouring the growth of *Cl. welchii* suggest they are non-*welchii* Nagler-reacting clostridia. Nevertheless the fact that all but 2 of the cultures came from wounds that contained *Cl. welchii*, and the impossibility of establishing the absence of *Cl. welchii* in the cultures without the use of a single-cell culture method, at present preclude a definite answer. All that can be said with certainty is that a feeble Nagler reaction is given by a few cultures in which it has so far proved impossible to demonstrate *Cl. welchii* by ordinary bacteriological technique. In the light of this fact the appearance of a feeble reaction must for the present remain inconclusive.

Aerobes.—In routine tests, 3 haemolytic aerobic spore-bearers were Nagler-tested; 2 were feebly positive.

Value of the Test and its Interpretation

Well-defined strongly positive Nagler reactions reliably indicate *Cl. welchii*, and the test is an exceedingly useful addition to the routine litmus milk tests. It is much more easily elicited than the stormy clot. When single colonies are used as inocula 80% of strains of *Cl. welchii* give a strongly positive Nagler reaction on first testing, whereas only 45% give a stormy clot in litmus milk. Spray's iron milk (1936) is more sensitive than litmus milk, but the "stormy clot" is produced in this medium by a number of other clostridia—namely, *Cl. aerofoetidum*, *Cl. butyricum*, *Cl. multifermentans*, and occasionally *Cl. sphenoides*, *Cl. fallax*, *Cl. tertium*, and *Cl. septicum*. Hence the reactions in both milk media are less reliable than a well-defined Nagler reaction, which has the advantage of being serologically specific.

The test is effective, simple, and easy to apply, and yields results quickly with small amounts of materials. It cannot be used as the sole confirmation of an identification based on individual and colonial morphology because the feeble reactions given by some *welchii* strains are inconclusive.

A mixture of equal parts of Fildes's broth and human serum is preferred for the test. Being more sensitive to *welchii* toxin, yolk saline is a possible substitute for human serum, but it appears to be a poorer supporter of growth. Single-colony inocula are large enough for Nagler tests of all but the very poorest growers. They should be incubated until positive or up to three days; and they should not be recorded as negative until the growth has been good for at least two days. Centrifugation is necessary for accurate reading, but, in view of the occasional change in the specific gravity of the flocculent material, tubes must be read daily both before and after spinning.

For routine rapid identification the test should be applied to any colony suspected of being *Cl. welchii*, for there is a very good chance of obtaining a result in twenty-four hours. At the same time as the Nagler test is set up, a meat-broth culture should be sown and, if the first test is negative in twenty-four hours, used for a heavy

inoculum in a second test. This will probably yield a result by the second day. The test thus affords a method by which a positive specific result may be obtained within two or perhaps three days of taking the specimen.

Nagler reactions may be obtained on solid media. On Fildes's agar containing 10 to 20% human serum sixteen-hour colonies of *Cl. welchii* are surrounded by clearly defined zones of marked opacity 2 mm. wide. With longer incubation the zones extend, often up to 8 mm. By the addition of 4 units of *welchii* antitoxin per c.cm. of medium the formation of the zone is completely inhibited. (On antitoxin medium of this strength a few colonies of one *welchii* strain produced a thin ring of opacity about 0.2 mm. wide and about 1 mm. from the colony, apparently in the depth of the medium; it was completely inhibited by 24 units of antitoxin per c.cm.) The 7 Nagler-reacting cultures of *Cl. bifermentans* type, and the N.C.T.C. strains *Cl. sordellii* and *Cl. centrosporogenes*, produced a similar opacity, which sometimes required forty hours' incubation before developing; in confirmation of the finding of Cook (personal communication) *Cl. oedematiens* produced a similar neutralizable zone; all other anaerobes tested produced none at all. This adaptation of the Nagler reaction to a solid medium has already proved a useful means of detecting *Cl. welchii* within twenty-four hours of taking the swab. Test plates are more sensitive than test fluids; great caution must therefore be exercised in the interpretation of feeble or slowly developing plate reactions. A control antitoxin-containing plate is essential.

Summary and Conclusions

The production of a turbidity in human serum by the toxins of growing *Cl. welchii* (Nagler reaction) is a valuable aid to the rapid identification of the bacillus for diagnostic purposes. Excellent results are obtained with a mixture of equal parts of human serum and Fildes's broth incubated anaerobically. The seeding of a single *welchii* colony into such a mixture produced a strong reaction in 80% of the tests after one to two days' incubation. The reaction is specifically inhibited by antitoxin. Feeble reactions are not unequivocally indicative of *Cl. welchii*, since they are given by certain other species of anaerobic spore-bearer. Human serum-Fildes's-agar provides a means of detecting *Cl. welchii* on plates within twenty-four hours of taking a swab.

I am greatly indebted to Dr. Herta Schwabacher and Dr. A. C. Cunliffe for their help with tests of wound anaerobes; to Dr. E. T. C. Spooner for *welchii* strains; to Dr. C. R. Amies of the Lister Institute, Elstree, for antitoxin; to Dr. R. St John Brooks, Major MacLennan, and many others for strains of clostridia; and to Prof. A. A. Miles for interest and advice. The work was made possible by a personal grant from the Medical Research Council.

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M. Kobro and P. Owren (*Norsk Med.* 1941, **9**, 447) state that trichinosis had not been seen in Norway since 1882 until the summer of 1940, when an outbreak of seven undoubted cases occurred at Strömmen, near Oslo. Six showed the classical symptoms of the disease, such as oedema of the eyelids, gastro-intestinal disturbance, stiffness of the muscles, pronounced eosinophilia, and fever. One had atypical clinical symptoms with gastro-intestinal manifestations, but with albuminuria and haematuria. The cause of the epidemic was the consumption of inadequately cooked pork. All recovered.

THE AFTER-TREATMENT OF PARAPLEGIC PATIENTS FOLLOWING INJURIES TO THE SPINE

BY

Lieut.-Colonel E. L. GOWLLAND, D.S.O., T.D., M.B.
Commandant, Star and Garter Home for Disabled Sailors, Soldiers, and Airmen

As the result of air raids there must now be in this country more cases of paraplegia following wounds and crushing injuries to the spinal column than ever before, especially amongst the civilian population. The immediate treatment of these most serious injuries is well known, but it may be emphasized that in first moving such cases it is wise to place the patient in the prone position on a stretcher or other means of transport, to prevent further crushing of the cord.

It is the after-treatment that is so important—that is, when the patient, having recovered from shock, having perhaps had a laminectomy performed to remove spicules of bone or to relieve pressure from the cord, having in many cases, especially among the males, had cystotomy, with suprapubic drainage and the like, has settled down and become accustomed to a paraplegic existence. After complacency has been established, life in these cases is not necessarily miserable, but it is full of surgical and medical pitfalls, the avoidance of which is essential to the preservation of a reasonable degree of comfort.

Let us, then, consider the treatment when the spinal injury has not resulted in speedy death. A very small proportion of these patients recover completely; but most of them remain paralysed, and in these cases the after-treatment here to be suggested will enable them to be comparatively free from pain, to enter happily into sedentary occupations and games, and to be mentally normal. The essentials are: (1) to ensure against infection of the urinary tract; (2) to guard against trophic ulcers and bed-sores; (3) to mitigate the serious discomfort of the incontinences; and (4) to make provision for adequate sleep and deal with mental anxieties by giving suitable sedative medicines.

Infection of the Urinary Tract

The "end" condition in nearly all paraplegics is a pyelonephritis with uraemia (in the absence of intercurrent disease, to which they appear to be no more subject than normal individuals). Patients often present a condition of retention with overflow, and these cases call for suprapubic cystotomy, which they usually get. But there has been a practice of inserting through the suprapubic opening a de Pezzer or Malecot drainage tube and letting it do its own work quite indefinitely, without daily irrigation of the bladder and frequent removal and sterilizing of the tube.

All such cases develop a mixed infection of the urine, very many have bladder calculi, and most have a pyelitis. Here we cast out these self-retaining tubes and insert a 12-inch or 16-inch sterilized Jaques catheter into the suprapubic wound. Another catheter is placed daily in the urethra and connected with a tube from an irrigator, which is hoisted about 2 feet 6 inches above the bladder, and the "wash-out" with boric or some similar lotion is carried out via the urethra, through the bladder, and out by the suprapubic tube. This is a reversal of the usual method of irrigation, but many years of experience have convinced me of its efficacy. A fresh suprapubic tube is now inserted, being fixed by strapping to the abdominal wall; it is then connected by a double clip with another tube leading to a urine bottle attached

to the side of the bed. When these patients are up in their wheel-chairs or hand-propelled tricycles the tube is connected with a rubber urinal suspended from the waist and strapped on to the leg. As most of these patients have no feeling below their lesion the removal of calculi from the bladder is easy and does not call for an anaesthetic.

The daily toilet of the bladder is the essential detail in the treatment of paraplegics. Most cases are given mixtures as follows: (*a*) 20 grains of acid sodium phosphate in one ounce of water thrice on one day, followed by (*b*) 10 grains of urotropine in water thrice on the next day; and so on indefinitely on alternate days.

Trophic Ulcers and Bed-sores

A trophic ulcer is due to lack of circulation or to deficient innervation of the skin. A bed-sore is a nursing crime. We do not have bed-sores in this Home! A trophic ulcer is an inevitable occurrence and cannot be healed, but it can be kept surgically clean.

When a paraplegic patient arrives he must be put to bed, using fracture boards, an air bed, or, better still, a "dunlopillo" mattress, and at once his palsied limbs must be placed in the optimal position by means of cushions, sandbags, and the like, to avoid hyperextension or hypercontraction. The usual daily nursing measures must be adopted for the health and preservation of the skin, especially in those parts subject to pressure. A bed-cradle should always be used to keep the weight of bedclothes off the badly nourished and paralysed lower extremities. Remember that the patient can feel nothing "below the belt"; it is therefore imperative that constant watch be kept on the sacral region, the hips, and the lower extremities, so that any redness or excoriation may be treated without delay.

When the vertebral lesion has consolidated—say some eight to twelve months after the injury—it is well to encourage the paraplegic to sit up and get about in a wheel-chair or a hand-propelled or motor tricycle; but these patients must have padded seats and plenty of cushions to protect their not too well nourished seating apparatus. At this period, too, we advocate two or three baths a week. This does them good; it stimulates the peripheral circulation and relieves the kidneys of some of their burden. We have our baths at right-angles to the walls so that an orderly on each side can expedite and assist in the process.

Massage certainly increases the cutaneous and muscular tone, and even after years of disability it conserves hope and at any rate induces the patient to feel that something is being done. *Electrotherapy* I do advise in the early stages, and until it has been conclusively ascertained which groups of muscles are worthy of notice and therapeutic attack, but I consider that to continue electric treatment to irresponsive muscles is a waste of time and electricity.

The Incontinences

Incontinence of Urine.—In the male this is readily managed by the provision of a recognized pattern of rubber urinal having a penile sheath connected with a tube to a container which is strapped to the leg and emptied by a tap near the ankle. For the female I fear there is no adequate provision. The few cases of urinary incontinence in women that I have met with have been difficult to deal with adequately, and in spite of all sorts of apparatus and trials the condition is likely to be appalling. No doubt something will soon be done about this: it is very urgent.

Rectal Incontinence.—When these paraplegics have as it were settled down—say a year or two after their wounds—and they are able to get about in chairs and tricycles, we have found that a weekly or bi-weekly day in bed is most useful. We call these "enema" days—when patients are given a high colonic injection of water, soap, and turpentine to empty the large bowel; this enables them to exist the remaining days of the week without incontinence. They can therefore go to entertainments, cinemas, etc., with almost complete confidence that there will be no unpleasant happenings.

Shock, Sleep, and Pain

In the early stages enough sedatives must be given to counteract shock, which is intensified by the contemplation of years of inaction and invalidism. Bromides are valuable. If these do not work, morphine may be necessary; but it is so easy for the paraplegic to become a morphine addict that I seriously counsel the withholding of its use unless pain is unbearable.

These people must have sleep: dial, adalin, soneryl, and all sorts of others may be used, but you may finally have to resort to morphine.

Conclusion

There are two points to remember: (1) in the initial stage the freeing of pressure on the spinal cord by laminectomy; (2) the unremitting nursing care of the whole body of the patient; and especially the daily toilet of the urinary tract, which of itself can prolong life for these unfortunate people.

After nearly seventeen years in charge of this Home for Paraplegics and after many years of direction in the management of these cases by the late Sir John Thomson-Walker, I feel that perhaps I may be forgiven for appearing didactic.

INTRAVENOUS ANAESTHESIA IN OBSTETRICS

BY

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In general practice, especially in times like these, obstetric operations have usually to be conducted with only the nurse or midwife as assistant. The difficulty and anxiety so often experienced with inhalation anaesthesia under these conditions led me, some four years ago, to a trial of intravenous anaesthesia as an alternative. It seemed to me that this method would add enormously to the patient's comfort, while at the same time it would very largely free the nurse, who, being relieved of the duties of anaesthetist, would be able to supply that extra pair of hands so invaluable.

Choice of Evipan

Evipan was chosen because it had been employed freely in all kinds of case. I used this drug throughout this series, having found no reason to change it.

I first tried evipan in cases needing repair of the perineum, and it gave complete satisfaction. I then employed it in low-forceps operations. I have given it in over 50 cases, and only once have I had to reinforce anaesthesia with open ether. The ideal case is that in which the head is on the perineum, when, with the aid of a small pair of forceps, such as those used and described by Wrigley, labour can safely be shortened. It was in just such a case that the unpleasantness and inconvenience of open ether or chloroform seemed often to outweigh the relief and advantages to patient and practitioner alike.

Some of the more difficult obstetric operations have also been carried out with evipan, with complete satisfaction so far as anaesthesia is concerned. One patient, a primi-

para, was delivered of a breech with legs extended, a leg having to be brought down. The child did very well, and the mother suffered no undue shock. In 3 cases persistent occipito-posterior positions have been manually rotated and delivery made with forceps, without undue hurry being experienced, and neither mother nor child appeared to suffer in any way.

In 6 cases the head was found to be unexpectedly "tight," and considerable traction was required to deliver the child. In 4 of these a perineal tear resulted, but this was repaired without any additional anaesthetic.

Evipan has been given, in rather smaller dose, to 7 patients just before the birth of the head, when forceps were not used. In one case trouble was experienced with the child after delivery—there being some delay in respiration. In the other 6 cases the children cried at once and there were no neonatal complications. In no case was there any excessive post-partum bleeding, and the placenta always appeared to separate quickly and easily.

Description of Technique

The technique which is now adopted has been modified with increasing experience, and I hope that the following brief description may be of value to others.

Having decided to deliver the patient, she is placed in the left lateral position and obstetric aid straps are applied. The type used has been that described by C. J. Penny (1933): one strap encircles the abdomen and is affixed to the head of the bed; the other holds the patient's hips flexed and passes over her neck. The buttocks and perineum are then thoroughly swabbed with dettol cream, and a swab covered liberally with dettol cream is left in the vagina.

The operator, gowned and masked and with bare washed hands, is now ready to administer the evipan. A prop is placed between the patient's jaws, and the nurse, standing by her head, helps in steadying the arm: a firm grip above the elbow will make the veins in the antecubital fossa more obvious. In every case 10 c.cm. of the 10% solution of evipan has been used. The first 3 or 4 c.cm. is injected quite quickly, and after a pause the remainder of the dose is given rather more leisurely —about a minute being taken over the whole procedure. In all my cases I have had the help of only the nurse or midwife; she remains at the patient's head, holding the chin well forward, and from the same position she is able later to support the patient's right leg by taking hold of the strap.

The operator now re-washes his hands and dons sterile gloves. The dettol cream swab is extracted from the vagina and is used for one last application to perineum and buttocks. Sterile towels are then used to cover exposed areas, after which a catheter is passed, the receiver being held by the nurse, who has it ready beside her. At this stage the forceps are applied to the child's head and the extraction is carried out in the ordinary way. When there has been the need for earlier sedation by chloral and bromide, or morphine, a very complete anaesthesia has been experienced, with a patient perfectly still. In one or two cases in which there has been no previous medication slight movement of the legs has been experienced, and it is for this reason that the obstetric straps are advised; for with them I have never been in any way inconvenienced by this tendency to move.

As has already been said, the children give no trouble; the third stage is passed rapidly, and the patient is usually recovering consciousness by the time one is ready to leave her. One of the ergot preparations is injected after the birth of the placenta, and it is always my practice to record the systolic blood pressure before leaving the patient. Readings of under 100 mm. Hg (which have not been met with in this series) should be taken as a warning of incipient shock and should be countered by the usual methods.

During the past six months this method of anaesthesia has been adopted by Dr. C. J. Penny, honorary obstetrician to the Royal Hampshire County Hospital. He tells me that he has used it in over 20 cases, and that it has been uniformly satisfactory.

Summary

The advantages of intravenous anaesthesia in the easier obstetric operations are discussed.

In over 50 cases in which evipan sodium in 1-gramme doses has been used it has given entire satisfaction, and there have been no complications in the progress of mother or child.

A brief account of the technique is given.

REFERENCE

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EFFECT OF BENZEDRINE ON THE OCULOGYRIC CRISES OF PARKINSONISM

BY

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In the last few years several articles have appeared in American medical journals reporting the beneficial results which may be expected when benzedrine is administered in conjunction with stramonium or hyoscine to cases of post-encephalitic Parkinsonism (Solomon, Mitchell, and Prinzmetal, 1937; Finkelman and Shapiro, 1937; Matthews, 1938; Davis and Stewart, 1938). Of the symptoms discussed it would appear that oculogyric crises react best to this treatment—in fact, three of the four articles referred to claim that this symptom was relieved in every case in which it occurred.

The investigation described below was carried out on patients at the National Hospital for Nervous Diseases, Queen Square, and at the Royal United Hospital, Bath, in an attempt to reproduce these uniformly good results. It is impossible to control an investigation of this type accurately, certain criticisms of the dosage, and the shortness of the period of observation in some cases, being bound to arise. It is felt, however, that by concentrating on an isolated symptom, such as the oculogyric crisis, which can be recorded by the patient, a more accurate impression of the effect of benzedrine on post-encephalitic Parkinsonism will be obtained than by considering rigidity, tremor, or sleep disturbance, which are obviously more difficult to assess.

Seventeen patients were observed while under treatment with stramonium, hyoscine, or some similar drug, and a record was kept of their oculogyric attacks over periods ranging from two to twelve weeks. Benzedrine was then given in various doses up to 30 mg. a day in addition to the previous treatment, and the attacks were again recorded over similar periods. In two cases benzedrine was given alone.

In the table the average number of attacks per week is stated, as it is considered that this method will give the most accurate comparison between the cases. It should be realized, however, that in patients showing a small number

of attacks this figure will not give such a true indication of the response to treatment as in those with a larger weekly average.

Summary of Results

The results of the 17 cases treated were as follows: good, 4 (23.5%); moderate, 5 (29.4%); poor, 8 (47.0%).

Table of Results

No	Sex and Age	Treatment	Average No. of Attacks per Week	Remarks	Result
1	M. 20	Extr. stramon. sic. 0.25 mg., q.d.s.	3.0		
		Original treatment + benzedrine 10 mg. b.d.	1.4	No improvement in other symptoms	Moderate
		Original treatment only	2.5	Stated that he missed benzedrine	Relapse when benzedrine stopped
2	F. 31	Placebo	1.3		
		Tr. stramon. ℥xxx, tr. nucis vom. ℥x	0.75		
		Above treatment + benzedrine 10 mg. b.d.	1.25	Attacks of shorter duration	Nil
		Benzedrine increased to 15 mg. mane, 10 mg. midday	1.0		Increase in attacks when benzedrine stopped
		Tr. stramon. and tr. nucis vom. only	5.0		
3	M. 35	Extr. stramon. sic. 0.25 mg. b.d.	1.83	B.P. 165/105	
		Original treatment + benzedrine 5 mg. b.d.	1.33	Dizziness if benzedrine taken on empty stomach. Thought he was much improved	
		Original treatment only	1.33	Said there was not much difference when benzedrine stopped	Nil
4	F. 19	Tr. stramon. ℥xxx, ac. hydrobrom. dil. t.d.s.	1.0		Good
		Original treatment + benzedrine 10 mg. b.d.	0.25	General improvement	Some improvement maintained when benzedrine stopped
		Original treatment only	0.5	Said she missed benzedrine	
5	M. 22	Hyosc. hydrobrom. gr. 1/100, atropin. sulph. gr. 1/250, tr. stramon. ℥xxv, t.d.s., luminal gr. 1/2 b.d.	2.0		Good
		Original treatment + benzedrine 10 mg. b.d.	1.25	Said benzedrine improved symptoms, but did not miss it when it was stopped	Improvement maintained when benzedrine stopped
		Original treatment only	1.5		
6	F. 22	Hyosc. hydrobrom. gr. 1/100 t.d.s.	0.67	B.P. 150/75	
		Original treatment + benzedrine 10 mg. b.d.	1/1.33	Did not take benzedrine regularly. Morning headache while taking it	Nil
		Original treatment only	0.67		
7	M. 23	Tr. stramon. ℥xlv t.d.s.	1.5	Attacks lasted 1 hour each	Moderate
		Original treatment + benzedrine 5 mg. b.d.	1.1	The majority of attacks lasted 1/2 hour each	Improvement maintained when benzedrine stopped
		Original treatment only	1.0	Said tremor was worse without benzedrine	
8	F. 27	Extr. stramon. sic. 0.25 mg. t.d.s.	2.5		
		Original treatment + benzedrine 5 mg. b.d.	1.5		Ditto
		Original treatment only	1.62		
9	M. 27	Tr. stramon. ℥lx, hyosc. hydrobrom. gr. 1/100, t.d.s.	2.0		Moderate
		Original treatment + benzedrine 10 mg. b.d.	1.25		Improvement on benzedrine and stramon. and hyosc.
		Benzedrine increased to 15 mg. mane, 10 mg. midday	1.5		Worse on benzedrine alone
		Benzedrine 15 mg. mane, 10 mg. midday, given alone	3.0		Improvement maintained when benzedrine stopped
		Original treatment + benzedrine 15 mg. mane, 10 mg. midday	2.0	No attacks for 14 days, then 4 attacks in 14 days	
		Original treatment only	0.75		

Table of Results (continued)

No.	Sex and Age	Treatment	Aver. No. of Attacks per Week	Remarks	Result
10	F. 19	Hyosc. hydrobromide gr. 1/150, tr. stramon. ℥xxx, tr. nucis vom. ℥iv, t.d.s., luminal gr. 1/4 nocte	0.75	Took benzedrine irregularly for part of time, but stated that attacks were improved. No worse without benzedrine	Nil
		Original treatment + benzedrine 10 mg. b.d.	1.0		
		Original treatment only	0.87		
11	F. 25	Tr. bellad. ℥vii, tr. stramon. ℥xv-xxv t.d.s.	Almost daily	B.P. 145/90. Mitral stenosis	Good
		Benzedrine 5 mg. b.d. only	3.7	Pain in chest like dyspepsia 2 hours after benzedrine	Improved on benzedrine only. Still more improved on benzedrine, belladonna, and stramonium. Relapse on stopping benzedrine
		Original treatment + benzedrine 5 mg. b.d.	1.7		
		Original treatment	Almost daily		
		No treatment	"		
12	F. 46	Extr. stramon. sic.	2.5		
		Original treatment + benzedrine 10 mg. b.d.	2.5		
		Original treatment — benzedrine 15 mg. mane, 10 mg. midday	2.25 (?)	Unreliable record kept by patient	Nil
		Original treatment only	2.2		
13	M. 26	Tr. stramon. ℥x hyosc. gr. 1/200	0.75 slight 0.33 severe		Good
		Original treatment + benzedrine 10 mg. b.d.	0.53 slight 0.18 severe		Relapse on stopping benzedrine
		Original treatment + benzedrine 15 mg. mane, 10 mg. midday	0.33 slight 0 severe		
		Original treatment only	0.5 slight 0.33 severe		
14	M. 22	Tr. stramon. ℥xx t.d.s.	2.0	History of head injury W.R. ++++	Nil
		Original treatment + benzedrine 10 mg. b.d.	2.5		
		Original treatment + benzedrine 15 mg. b.d.	2.5		
		Original treatment only	3.0		
15	M. 27	? ?	Several daily	Sleepless	Moderate
		Original treatment + benzedrine 10 mg. b.d.	Worse		Best result with small dose of benzedrine
		Original treatment + benzedrine 5 mg. b.d.	3.4	Still sleepless	
16	F. 22	Acid. hydrobrom. dil. ℥v, tr. lobelia ℥v, tr. stramon. ℥xxx t.d.s., tab. luminal gr. 1/2 nocte	6.5		
		Original treatment + benzedrine 10 mg. b.d.	6.0		Nil
		Original treatment + benzedrine 15 mg. mane, 10 mg. midday	7.25		
		Original treatment only	6.0		
17	M. 22	Hyosc. gr. 1/100 b.d.	1.0		
		Original treatment + benzedrine 5 mg. b.d.	0.75	Palpitation. Pulse 136. B.P. 125/70. No cardiac enlargement, but had a generalized systolic murmur and accentuated pulmonary second sound. Tachycardia persisted some months. Signs suggested mitral regurgitation	
		Original treatment + benzedrine 10 mg. b.d.	0.75		
		Original treatment — benzedrine 10 mg. mane, 15 mg. midday	0.75		Nil
		Original treatment — benzedrine 15 mg. b.d.	1.0		

This shows some degree of improvement in 53% of cases. In Cases 1, 2, 11, and 13 the attacks increased when benzedrine was stopped. In Cases 4, 5, 7, 8, and 9 some improvement was maintained when benzedrine was

stopped. In Cases 9 and 11 benzedrine was given alone: Case 9 was worse, but improved when the treatment was combined with stramonium and hyoscine; Case 11 improved but a better result was obtained when belladonna and stramonium were given as well. Of the cases not improved, one (Case 14) gave a history of head injury and showed a strongly positive Wassermann reaction.

Complications.—In 2 cases of mild hypertension one patient complained of dizziness (Case 3) and one of headache (Case 6). In 2 cases of mitral disease one patient complained of pain in the chest (Case 11) and the other (Case 17) developed a persistent tachycardia which resisted treatment for a considerable time. Only one patient complained of sleeplessness.

Discussion

These results confirm the general impression that in the oculogyric crisis of Parkinsonism benzedrine acts better if combined with drugs such as stramonium or hyoscine. It is interesting to note that 5 patients maintained their improvement even when the drug was stopped and they returned to their original treatment. This, of course, may have been merely coincidence.

In considering the complications which occurred, it would appear necessary to exercise caution in those cases which show signs of hypertension or heart disease, as it will be noted that certain symptoms, including a prolonged tachycardia, occurred in such cases.

The results obtained by American authors are summarized as follows:

Author	Dosage of Benzedrine	Percentage of Cases Improved	No. of Cases Treated
Solomon, Mitchell, and Prinzmetal (1937)	10-20 mg. b.d, or t.d.s. (gave up to 160 mg. p.d.)	100%	8
Finkelman and Shapiro (1937)	20-30 mg. p.d.	100%	7
Matthews (1938)	15-90 mg. p.d.	Improvement reported	?
Davis and Stewart (1938) ..	40-60 mg. p.d.	100%	23

It will be seen that comparison can only be made with those cases described by Finkelman and Shapiro, who gave doses of benzedrine similar to those employed in my own series. I was unable to reproduce their uniformly good results, having had 53% successes as against the 100% which they reported. The remaining three groups of American workers used much larger doses, and I cannot from personal experience say if correspondingly good results would have been obtained had I given similar amounts of benzedrine in my cases.

Conclusions

Benzedrine, even in small doses, may be expected to give relief to about 50% of patients with oculogyric crises if administered with drugs of the belladonna group. Larger doses are worthy of trial if a careful watch is kept on patients with cardiac disease or hypertension.

My thanks are due to the honorary staff of the National Hospital, Queen Square, for allowing me to publish cases which I treated while assistant medical registrar to that hospital, and to Dr. R. G. Gordon of the Royal United Hospital, Bath, for his permission to include Case 17. I also wish to thank Messrs. Menley and James, who kindly supplied the benzedrine used in the investigation.

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Clinical Memoranda

Treatment of Varicose Ulcer with Eczema

To-day the standard treatment of varicose ulcers is by "elastoplast." There are, however, a certain number of cases that are intractable; they appear to be those complicated by eczema. The skin is degenerated, being shiny, purplish, and scaly. Here are four case histories, the first three being consecutive.

CASE REPORTS

Case 1.—A woman aged 45 had "white leg" following pregnancy seventeen years previously. An ulcer appeared two years later, and persisted until June, 1939, when treatment by elastoplast was started. It was 3 in. by 4 in. in area, and was situated about 2 in. above the internal malleolus. After a year the ulcer measured 2 in. by 1 in. Further treatment failed to reduce its size, and another smaller but very painful ulcer, about one-half inch across, appeared. The whole leg was the seat of eczema by now. Treatment by reversed elastoplast was tried without success. In despair a "viscoplast" bandage (a bandage impregnated with Unna's paste) was applied in three thicknesses. It was painful at first, but after a few days the pain ceased. About this time the patient was confined to bed for two weeks on account of laryngeal spasm. A certain amount of discharge occurred: this was absorbed by packing with wool. On removal three weeks later the ulcer had almost disappeared, and a second application resulted in a complete cure. For the last six months she has worn a crêpe bandage. Apart from the two weeks in bed, which was a help, she has done her ordinary work as a farmer's wife.

Case 2.—A woman aged 64 had suffered from a varicose ulcer off and on for twenty-nine years. When she came for treatment it was the size of a shilling. Elastoplast was applied twice in five weeks, and resulted in great improvement, but she refused to have it applied again. Viscoplast was tried, with the result that the ulcer healed soundly—the first occasion since it appeared. She did her work all the time.

Case 3.—A woman aged 67 had a small painful ulcer over the internal malleolus, with degeneration of the surrounding skin. Here "viscoplast" was applied at the outset, causing much pain for the first few days. It was left in position for three weeks, when the ulcer was found to be soundly healed. She was able to do her housework after the first few days.

Case 4.—A man aged 65 had for six years the worst varicose eczema I have seen. An abscess had formed over the patella, possibly the result of septic absorption. "Elastoplast" was applied twice with some benefit, then followed two applications of "viscoplast," each kept on for three weeks. The man, a butcher, is on his feet a great deal, but directly the abscess over the patella had healed he carried on with his work. He now wears a crêpe bandage, and declares he is better than for years. The skin is still purplish, but is not ulcerated or scaly.

London, W.1. A. P. BERTWISTLE, F.R.C.S.Ed.

An award of the Dr. Jessie Macgregor Prize in Medical Science will be made in July to the applicant who presents the best record of original work in the science of medicine. Such work may be published or unpublished, but must not have been published earlier than three years prior to July, 1941. The value of the prize is not less than £50 and is open to medical women who are graduates in medicine of the University of Edinburgh, or who have taken the Scottish triple qualification, and who, before becoming qualified, have studied medicine for at least one year in Edinburgh. The successful applicant shall, within six months following the award, deliver a lecture to the medical profession in Edinburgh on the subject of the work for which the prize has been awarded, such lecture to be entitled "The Dr. Jessie Macgregor Lecture." Applications marked "Dr. Jessie Macgregor Prize" must reach the Convener of Trustees, Royal College of Physicians, Edinburgh, 2, not later than June 30.

Reviews

THE DIFFICULT CHILD

The Doctor and the Difficult Child. By William Moodie, M.D., F.R.C.P., D.P.M. (Pp. 214. $1.50, or 8s. 6d net.) New York: The Commonwealth Fund; London: Oxford University Press. 1940.

Dr. Moodie has written a book on the difficult child which is characterized by his usual lucidity and sound common sense. Published by the Commonwealth Fund of America, which has so generously supported child guidance in this country, this small volume sets out the principles and practice of child psychiatry in simple terms and without any noticeable bias towards any of the extreme schools of modern psychology. The first part deals with general principles. The difficulties presented by children are very varied, and only long experience will ensure that the significance of these is properly evaluated. The child and his parent must be regarded as a unit, although the child is also an individual. He demands, and has the right to, love and security and understanding: and if the parent cannot give these then it may be the parent who requires treatment. Dr. Moodie is one of those who believe that many of the problems of childhood are much less complicated than some would have us believe, and that adjustment of the environment is often the main requisite, with some guidance of parent and/or child on how to meet the situation, but he does not neglect the less common case when there is a profound disturbance of the child's own emotional life which can only be resolved by careful treatment of the child himself.

The second part of the book deals with specific problems such as stealing, lying, sex misdemeanours, truancy, and so on in the emotional field. Psychoses in children and mental deficiency are briefly dealt with, and the very important subject of educational backwardness is more adequately presented. Brief case histories are given to illustrate the various subjects touched upon, and this prevents the brevity of the presentation from resulting in dullness. This is a book which can be confidently recommended to both medical and lay readers: they will learn from it all that needs to be known about the difficult child by those who do not profess to be experts.

ABDOMINAL OPERATIONS

Abdominal Operations. By Rodney Maingot, F.R.C.S. Volumes I and II. (Pp. 1,385; illustrated. £5 the set.) New York and London: D. Appleton-Century Company. 1941.

Except that the covers are green instead of blue, this two-volume book is reminiscent in size, shape, and print of the last edition of Moynihan's classical two-volume contribution to abdominal surgery, published in 1926. Here, however, the resemblance ends, for the present book lacks the clarity of presentation and mastery of diction of the great Leeds surgeon. It is none the less a thoughtful and carefully prepared work, well written, and pleasing in many particulars, one of the chief of which is the illustrations. There are for the most part excellent wash drawings made by Miss Lariviere, and they also include some of Mr. Thornton Shiell's well-known work in the form of coloured plates of pathological specimens. Chapters on sternal puncture and post-operative chest complications are written by Drs. L. T. Bond and R. Sleigh Johnson respectively; otherwise the work is that of a single author, Mr. Rodney Maingot, who, however, freely intersperses throughout the text quotations in small print from important original contributions such as those of Wilkie on acute appendicular obstruction and Ernest Miles on cancer of the rectum. An index of quoted authors is not included, and the subject index is far from complete. Proof-reading might have been better; the legend to Fig. 93 on page 453 is "Stamm's gastrectomy," and should obviously be "Stamm's gastrostomy."

In certain discussions on treatment several operations are described, but no very clear lead is given as to which is the best of these and what the author's experience of the alternatives has been; thus in irreducible intussusception seven methods of treatment are mentioned, with the statement that all are associated with a high mortality, and the surgeon must obviously decide at the operating table which method will give the patient the best chance of recovery. But how is he to decide? If this work is to help the young surgeon confronted with such a problem some further comment is highly desirable, and Elliot-Smith's important paper (*Lancet*, 1935, 1, 992) on the outstanding value of lateral anastomosis in such cases might have been quoted with profit. We looked in vain for authoritative accounts of errors of rotation of the gut, of portal pylephlebitis, and of attempts at treatment of this condition by mesenteric venous ligature and the use of sulphonamides Disappointment in some directions, however, is largely compensated by full and interesting accounts of other abdominal lesions, and the account of gastric resection is perhaps one of the best parts of the book. Abdominal incisions and diseases of the vermiform appendix are well done, but we would like to have seen acute appendicular obstruction as a subheading to acute obstructive appendicitis, since it should surely be our object to recognize and treat the obstructive lesion before it becomes an inflammatory condition, as it invariably does if not dealt with very promptly. It is interesting to note that the author expresses strong belief in the occurrence of chronic appendicitis, and regards it as comparatively common. Prof. Grey Turner's important paper in *Chirurgica Scandinavica* (1932) might have been quoted on conservative resection of the rectum with preservation of the anal sphincter. We would also like to have seen the thorny subject of abdominal adhesions and their prevention discussed at some length, and some indication given as to the value of sulphonamide therapy administered by intraperitoneal and oral routes in inflammatory lesions. A complete chapter on anaesthesia for abdominal operations would be a useful contribution to a further edition.

Volume I deals with abdominal incisions, stomach and duodenum, spleen, pancreas, and the gall-bladder and bile ducts; Volume II with the liver, vermiform appendix, peritoneum, mesentery and omentum, external abdominal hernia, the intestines, and post-operative chest complications. There is, notwithstanding the points we have raised, much valuable material in this book, which should make its appeal to the thoughtful abdominal surgeon.

LOCAL GOVERNMENT ADMINISTRATION

The Municipal Year Book and Encyclopaedia of Local Government Administration, 1941. Edited by James Forbes. With a preface by the Right Hon. Malcolm MacDonald, M.P., late Minister of Health. (Pp. 1,443. 40s. net.) London: The Municipal Journal, Limited. 1941.

There is something very buxom and comforting about the appearance of the *Municipal Year Book* for 1941. It is as ample as ever—weighs four and a half pounds and has fourteen hundred pages packed with information about the various aspects of local government. It is all so normal, so traditionally English. One feels that whatever may change in British society, municipal institutions will remain. The town clerk is six hundred years old and is

support for the Jacksons' prejudice against tobacco and alcohol, it is hard to believe that the aetiology is as simple as this. The subject has been studied by StClair Thomson,[6] who weighed and compared all the many possible predisposing causes. He concluded that there was no definite proof in favour of any of them, and this conclusion still holds good. All forms of chronic irritation, including uncommon ones such as keloid scars and the results of poisoning by mustard gas, seem at times to enter the sequence of cause and effect. But statistical research is subject to so many errors requiring an unknown amount of correction that it is difficult through this method to obtain any exact or detailed information.

PLASMA PROTHROMBIN AND VITAMIN K

In a series of annotations we have kept readers informed about the rapid growth of knowledge of plasma prothrombin and vitamin K and their relation to haemorrhage in jaundice and the newly born, and the review by Brinkhous[7] which has lately appeared leaves very little new to say. The emphasis is on the physiology and biochemistry of prothrombin, and its exact role in blood clotting, which is still not clear. Prothrombin can be isolated in a fairly pure state, but the methods of extraction from plasma are very incomplete and cannot be used as a basis for quantitative estimation. Prothrombin is therefore determined indirectly by its power to form thrombin, which initiates the coagulation reaction. Brinkhous prefers the two-phase method of determining prothrombin, which has been used in his laboratory and which corresponds with the actual clotting process. The prothrombin is first converted into thrombin, and the amount of thrombin is then estimated by its ability to coagulate a fibrinogen solution. The clinical pathologist usually estimates prothrombin by the accelerated clotting test (Quick), which depends on the speed of clotting of plasma or blood when an excess of thromboplastin is added; or by Dam's test, which depends on the amount of thromboplastin necessary to produce a standard clotting time. Both these methods work fairly well in practice, but they assume that the prothrombin conversion time is a constant. This is certainly not true of different species, and it is almost certainly not true of members of the same species. For example, there are marked and constant differences in the plasma prothrombin level of infants as obtained by the one-stage and two-stage methods. Dam's test involves more assumptions, and the values obtained seem to be related less intimately to the plasma prothrombin level than in Quick's test or its various modifications. The important point for the clinician to remember is that, whereas a prolonged prothrombin time always spells trouble, a normal prothrombin time does not necessarily mean security from cholaemic bleeding. The clinical pathologist will continue to look for methods of making the tests more accurate and simple. Hobson and Witts[8] have suggested an artificial thromboplastin composed of Russell-viper venom and lecithin, while Souter, Kark, and Taylor[9] use brain emulsion which has been dried by the lyophile technique. This method has leaped into popularity as a result of its use for drying serum and plasma for transfusion, and there seems no reason why some of the troublesome biological reagents for the two-stage prothrombin test should not be similarly prepared.

Brinkhous describes four forms of vitamin K, which are all naphthoquinone derivatives. Vitamin K_1 comes from alfalfa extracts, vitamin K_2 from putrefying fish meal, and thiocol or K_3 from bacteria, while the synthetic vitamin K_4, which is the most potent variant and the one now used in therapeutics, is 2-methyl-1:4-naphthoquinone. Much work still remains to be done in determining the most appropriate form and route of administration in man, the dosage, and the speed of action. Vitamin K_4 is insoluble in water, but it can be given parenterally dissolved in oil[10] or as a compound with sodium bisulphite, which is water-soluble.[11] The parenteral route is probably the best, as it avoids the difficulty of absorption by mouth and the need to give bile in addition. The methods of prophylaxis and treatment of the haemorrhage of the newly born also need more experience before treatment can be standardized, and though the importance of the whole-blood injections may be diminished, it is not yet certain that they can safely be omitted if bleeding occurs.

HORMONES AND PSYCHIATRIC DISTURBANCES

The relation between the endocrine glands and the psychoneuroses and psychoses is being approached from two standpoints—that of the endocrinologist and that of the psychiatrist. The endocrinologist cannot fail to notice the association of psychoneurotic symptoms with primary endocrine disorders or adjustments, and the abolition of such symptoms with appropriate endocrine therapy. This is obvious at the climacteric in the female, and in such endocrine disorders as hyperthyroidism, myxoedema, virilism, Addison's disease, and Fröhlich's syndrome. The existence of a male climacteric is not universally accepted, but where symptoms analogous to those of the female climacteric are found the response to testosterone may be as dramatic as that which follows its use in the complete male castrate. In using the term "psychoneurosis" as associated with endocrine disorders one also includes changes in behaviour and personality. In the experience of the endocrinologist it is comparatively rare for a psychosis to result from an endocrine disease—so rare as to make one suspect, when the two are associated, that there was a previous constitutional predisposition to psychotic disorder. Nevertheless, in such conditions as thyrotoxicosis and myxoedema manic-depressive disorders do occur and sometimes respond to early and adequate correction of the endocrine disorder. Similar observations might be applied to the climacteric, but in view of the millions who pass through the climacteric without the slightest suggestion of psychotic disorder it seems unlikely that the climacteric can be more than a subsidiary factor in the development of a psychosis at this period. From another approach—namely, that of psychiatry—Mott was the first to point to the degeneration of the testis in dementia praecox. With increasing knowledge of endocrinology and the availability of specific sex hormones, the psychiatrist's interest has been quickened, and a spate of articles are beginning to appear in psychiatric journals, some less critical than

[6] *Cancer of the Larynx* by StClair Thomson and L. Colledge, 1930, p. 5, London.
[7] *Medicine*, 1940, 19, 329.
[8] *Lancet*, 1940, 2, 247.
[9] *Science*, 1940, 91, 552.
[10] Macfie, J. M., Bacharach, A. L., and Chance, M. R. A., *British Medical Journal*, 1939, 2, 1220.
[11] Kark, R., and Souter, A. W., *Lancet*, 1940, 1, 1149.

others. Some investigators undertake laborious biological assays of the excretion of oestrone, androsterone, gonadotrophin, etc., in the urine, in an endeavour to establish scientifically the existence of an underlying endocrine deficiency or hyperactivity. The fact that oestradiol and testosterone are secreted by the adrenals as well as by the gonads complicates the interpretation of results, but useful data should accumulate. A greater difficulty is that of cause and effect, as it is well known that hormone activity can be completely suppressed by psychic factors (for example, early amenorrhoea in anorexia nervosa), and, further, that degeneration from secondary avitaminosis occurs in endrocrine glands when psychogenic anorexia is present over a long period. Neustadt and Myerson[1] have undertaken urinary assays in various "neuropsychiatric disturbances," using calorimetric methods of assay. In an examination of thirty schizophrenics they find that the values for oestrone and androsterone "range from very low to very high," and the results do not warrant any conclusion. Comparing six patients with involutional melancholia with six normal controls, they find variations in hormone excretion in both groups are of similar order, and "we may tentatively conclude from our findings that hormonal regression, if present, is an accompanying and *not a pathogenic factor of the depressive psychosis in the* sixth decade of life." They also obtained negative results in hormone therapy of involutional psychoses. In male homosexuals (using a criterion of "overt homosexual conduct as the predominant and preferred sexual activity, with or without physical stigmata") Neustadt and Myerson found that "there is either a deficit of androgens combined with a normal amount or excess of oestrogens, or there is a normal amount of androgens combined with an excess of oestrogens," but "treatment of a few cases by testosterone injections produced no essential change in the homosexual feelings or conduct, although the urinary findings were changed." In psychogenic impotence associated with neurosis and not including psychotic cases, there was low excretion of androgens and oestrogens in eight of twenty cases, but there was no appreciable improvement in symptoms in the only two cases treated with testosterone. This is in accordance with other observers' failure to influence psychogenic impotence with testosterone. A surprising finding is "a very high hormone level of both androgens and oestrogens in five out of six male masturbators." Rubinstein, Shapiro, and Freeman[2] report the treatment of morbid sex craving in five females with 25 mg. of testosterone propionate injected thrice weekly, and claim good results in four. It is true that testosterone will, in certain circumstances, neutralize the biological effects of oestradiol, which latter may experimentally stimulate sex behaviour in the female; but, on the other hand, it has also been found that testosterone produces hypertrophy of the clitoris and heightened erotic sensitivity in that region in some cases. Hemphill and Reiss[3] investigated the state of endocrine function in thirty cases of involutional melancholia occurring at the menopause. They find symptoms of ovarian, thyroid, and adrenal dysfunction in the majority, but emphasize the complexity of the problem. Treatment with follicular hormone and corticotrophic hormone appeared to give promising results in some patients. The authors venture to suggest on clinical grounds, and from assay of gonadotrophic hormone in urine and results of therapy, that "disturbances of the activity of the anterior lobe of the pituitary are largely responsible for the protean characteristics of involutional melancholia." No one would deny that an interesting field of investigation is being opened up, but it is also obvious that great caution is called for in examining the results. It would be a mistake to ask too much of the science of endocrinology when applied to psychiatric problems.

[1] *Amer. J. Psychiat.*, 1940, 97, 3, p. 524.
[2] Ibid., 1940, 97, 3, p. 705.
[3] *J. ment. Sci.*, 1940, 86, 365, p. 1065.

OCULAR PALSY IN PITUITARY ADENOMA

It has been generally held that paralysis of the ocular nerves is not caused by pituitary adenoma, and that the nerves escape because they are protected by the carotid artery from lateral pressure by the tumour. Involvement of the ocular nerves does, however, occur, but the question often arises whether patients with ocular palsy are suffering from suprasellar tumours rather than from pituitary adenoma. Weinberger, Adler, and Grant,[1] in a review of the literature and a study of fourteen cases, conclude that not only are there signs of involvement of the outer wall of the cavernous sinus in a good many cases, but these signs may be the first or predominant feature. Pressure on the outer wall of the cavernous sinus shows itself clinically by pain along the first division of the fifth nerve and by various degrees of involvement of the third, fourth, and sixth. This syndrome, known as the sphenoidal fissure syndrome, was first described in relation to pituitary adenoma by Foix in 1922, though Bartholow discovered it in 1872 in connection with aneurysm of the cavernous sinus. De Lapersonne and Cantonnet used this syndrome as a basis for classifying pituitary adenomata into two groups —those with chiasmal signs, and those showing evidence of pressure on the external wall of the cavernous sinus. That visual symptoms are absent in many cases of pituitary adenoma is, of course, well known; Cushing estimated that they were absent in 20%. German,[2] in a review of fifty cases in Cushing's series of 327 pituitary adenomata, found evidence of nerve involvement (exclusive of unequal pupils) in twenty-four; in ten of these the first indication of pituitary adenoma was given by symptoms of pressure on the ocular division of the fifth nerve. It appears, then, that in a certain proportion of cases the adenoma expands chiefly sideways, resulting in a clinical picture different from that usually thought to be characteristic.

[1] *Arch. Ophthal., Chicago*, 1940, 24, 1197.
[2] Ibid., 1940, 24, 1235.

THE PSYCHOLOGY OF QUISLINGISM

Most of us have been surprised by the influence that Hitler has exerted not only over his own people but over individuals in countries not his own—those who have been willing to collaborate with the Nazis even at the expense of their compatriots. The outstanding, and to ordinary eyes despicable, Quisling phenomenon is open to a variety of explanations—"Every man has his price," and "Nothing succeeds like success." There is, too, the stuff of which revolutionaries are sometimes made, such as spite, injured pride, bitter feelings of inferiority, and sensations of frustration and impotence in the face of the prevailing order. No doubt many of Hitler's converts are psychopaths like Hitler himself, but without the energy which makes him look like a genius. They are, in fact, in Henderson's terminology, "aggressive" but not "creative" psychopaths. Although these explanations are satisfactory up to a point, the suspicion that they do not explain everything is shown in the frequent references to the so-called hypnotic powers of Hitler, not only over his own people but over his political visitors. It is recorded of Napoleon that he had a similar effect in engendering fanatical and childlike self-abnegation in some people. Tolstoy,[1] with the intuitive veracity of the first-class novelist, records how an elderly warrior, his face flushed and his eyes gleaming, led his troop through a river, drowning forty of them in the process, for no better reason than that Napoleon was looking on. "Quos Deus vult perdere, prius dementat." There

[1] Tolstoy, *War and Peace*, Book 9, Chap. 2

is no sense in such a performance; it is rather a kind of masochism. Those who to this day collect relics of Napoleon, and in a sense worship his memory, are examples *in vitro* of the same kind of abasement. Devotion of such sort deserves examination for its unconscious roots. Dr. Ernest Jones, in a recent analysis of the psychology of Quislingism,[1] has described the various attitudes of those who approved of Nazism—the passive acceptance of the slum-dweller, who thought it a matter of indifference who governed; the denial of Hitler's aggressiveness by the escapist, who asserted there would be no war; the partial admission of Hitler's aggressiveness by the appeaser, who thought it could be bought off; and the man who thought the aggressiveness quite justifiable and even advisable. Jones ascribes all these attitudes in their various degrees up to the fully developed acquiescence and co-operation of the Quisling to the unconscious attitude toward the father. There is fear of him, and of one's own dangerous impulses towards him. The Quisling way is to identify might with right, and to say that because these dangerous impulses are strong they must also be good. At the same time they are denied within the subject himself and projected on to the father, who thereby becomes good as well as powerful and with whom the potential Quisling identifies himself. The attitude is psychologically homosexual. However hypothetical these speculations may be, they emphasize what is clearly important—namely, the part played by guilty feelings in inhibiting resistance to Hitler. German propaganda has in this respect taken a leaf out of the book of some religions. It has known too well how to play on the existence of a sense of sin in the people of Western civilization—a sense which Freudians believe to be based on the forgotten unconscious conflicts of infancy and childhood.

HOSPITAL WORK AN "ESSENTIAL SERVICE"

The reservation of occupations, generally with some age limit attached, and the scheduling of essential services must, of necessity, be a rough-and-ready matter, and a changeable one, too, as the war develops. But now that men of older ages are being called up many faults in the reservation schedule become evident. No doubt when the Essential Services (General Purposes) Order was framed there was a disposition to say that so far as hospitals were concerned it was sufficient that doctors and nurses were in reserved occupations, but that was to leave out of account the many other employees—engineers and electricians, mechanics and stokers, ward-maids and lift attendants—who are essential to the running of a hospital. An immense variety of skilled work, the result either of technical instruction or of long experience, goes into hospital management. The treasurer of St. Bartholomew's has drawn attention in the *Times* to the case of a hospital with 600 beds where a depleted staff of two stokers are working seven days a week to keep the steam and hot-water supplies going, without which the treatment of patients would be impossible, and one of these men is shortly to be called up and there is no one to take his place. The age of exemption of hospital secretaries and other whole-time paid officers has lately been raised, and the fears expressed in many quarters that hospitals might thus be left without adequate staff to administer them are only partially allayed by the latest Ministry of Health circular (No. 2390) on the subject. The Ministry states that all hospitals, if they have not already done so, should take steps immediately to obtain and train substitutes for any staff who are likely to be called up. Application may be made for deferment for a short period of any officer for whose replacement adequate arrangements have not been made, but before recommending deferment the Ministry will have to be satisfied that the duties cannot be performed by a woman or an older man of suitable attainments, or that efforts to obtain such a person have failed. As regards engineers, mechanics, stokers, etc., the circular points out that the age of reservation for such workers is lower in "protected" establishments than in "non-protected" ones, and the Ministry of Labour is prepared to consider applications for admission to the Register of Protected Establishments from hospitals employing at least one whole-time worker in any of these occupations with "dual age of reservation." So far so good, but in many instances it will not be so simple a matter, as the circular would appear to suggest, to train in a "short period" substitutes for the highly technical work of which a hospital secretary is in charge. Moreover, hospitals still remain unprotected against the competition of more highly paid employment. It is extraordinary that hospitals are not scheduled as an essential service, and safeguarded as much as an ambulance right of employees to leave their work. Hospitals are to-day in the front line; those in the cities are casualty clearing stations. They should be recognized as an essential service, and safeguarded as much as an ambulance service in the battle zone.

[1] *Internat. J. Psycho-anal.*, 1941, 22, 1.

THE PHOENIX NUMBER

The letter of congratulation from a brother editor printed in our correspondence columns this week gives an opportunity to thank many readers and contributors for their kind messages and to say a few words by way of explanation. The "Notice to Readers" on page 755 of the *Journal* of May 17 was necessarily ambiguous, because one of the two events briefly chronicled was very recent and time has to elapse before explicit mention of such things may be made in public. The damage to B.M.A. House occurred during a heavy air raid on London in April. The dislocation of our printing arrangements by enemy action was some three weeks later. Nobody was hurt in these "incidents," but much valuable property was destroyed or severely damaged, and the second misfortune threatened to interrupt publication of the *Journal*. Prompt and effective action restored the printing front and established new lines of communication; so that the issue dated May 17, 1941, appeared without any delay, after being reset at great speed in a different type-face and passed for press under conditions imposing heavy strain upon all members of the Editorial, Advertisement, and Publishing Departments, and not least upon the indefatigable printers and proof-readers. Members of the Association who opened their *Journal* that week-end at the usual time may now be told that something not far short of a miracle had happened in the preceding four days, and that their thanks for this have to be spread over a large number of people who worked together for a common purpose. Fortunately, not many MSS. have been lost, and proofs of all matter standing in type were in safe keeping elsewhere when the enemy struck. Authors of articles or letters known to be missing have already supplied duplicate copies at our request.

The Royal Swedish Academy of Science has elected Sir Thomas Lewis, M.D., F.R.S., a Foreign Member in the Faculty of Medical Research.

Prof. J. A. Ryle, M.D., F.R.C.P., has been appointed Consultant Adviser in Medicine to the Minister of Health for the Emergency Hospital and Medical Services.

CHEST SURGERY IN WAR

This is one of a short series of articles based on lectures given at the British Postgraduate Medical School, Hammersmith

ANATOMY, PHYSIOLOGY, AND PATHOLOGY OF WOUNDS OF THE CHEST

BY

T. HOLMES SELLORS, D.M., M.Ch., F.R.C.S.

In injury to the chest, as also in the case of the head, it is not so much the damage to the container as the damage to the contents that matters. Actual damage to the enclosed viscera may have a profoundly adverse effect on the respiratory and circulatory systems, and to this may be added a series of secondary changes that result from the opening of the pleural cavity. These factors in themselves may be a grave menace to life, but even if they are successfully countered the question of the later development of infection has to be considered. Consequently a chest wound offers problems that are not found in many other parts of the body where the extent and effect of the destruction can be more or less estimated immediately.

Before entering into any discussion of anatomy and physiology it is well to have one precept in mind, and that is that the course and the effect of any missile after contact with the body are almost unpredictable. A well-known surgeon once stated that he was quite prepared to believe anyone's story about the behaviour of any missile on any human frame, and could add a few himself. The varying resistance of tissues, the angles of impact, and a whole host of factors make it imperative that no one should take the apparent track of a wound for granted when it comes to the question of diagnosis and treatment. Nor should it be forgotten that multiple injuries are only too common and that a small and apparently trivial wound may disastrously be overlooked in face of a more urgent and obvious lesion elsewhere.

Some Relevant Anatomical Points

In considering the gross anatomy of the chest there are some quite elementary points that are not perhaps always fully appreciated. The first point that strikes one when looking at the thoracic cage stripped of its coverings is its tapering or cone-shaped upper part. The squared appearance of the human torso depends on the shoulder girdle with its attached structures: in the region of the shoulders the actual thorax is deeply placed and is well covered by muscle layers, in contrast to the lower part, where ribs are easily palpable and the form of the thorax is quite apparent. The practical application of this feature lies in the fact that a missile traversing the upper part of the chest will pass through thick muscle layers which tend to close on the track and prevent communication of the pleural sac with the open air. On the other hand, penetration through the lower part of the chest is apt to leave the pleural cavity open and produce the dangerous form of "sucking" wound.

Among other points that may be emphasized is the height to which the diaphragm rises into the chest. This "doming" upwards of the muscle infringes considerably on the long axis of the thorax and leaves at the periphery the deep costo-phrenic sinus, which, it should be noted, is deeper behind than before. A penetrating wound of the lower chest will frequently puncture the diaphragm after injuring the lung fringe and produce varying lesions of the upper abdominal contents. The blood supply of the diaphragm is more extensive than might be supposed for such a thin sheet of muscle, and this should be remembered if incision through its fibres is practised.

A cross-section of the chest shows that the vertebral column projects far forward into the cavity, so that the distance between the sternum and the spine is relatively small (a matter of some 4 to 4½ inches), but on each side lies a large paravertebral gutter which accommodates much of the lung tissue. It is in these areas that fluid tends to accumulate in the pleural cavities, and that aspiration or drainage of the free pleural sac will be most effective.

The obliquity of the ribs is a feature that makes orientation and location in the chest much more difficult than if the thorax was a conveniently arranged system of transverse segments. A study of the normal antero-posterior radiograph illustrates the differences in level between the anterior ends of the ribs and their corresponding vertebrae. For example, the third costal cartilage lies in the same plane as the seventh thoracic vertebra, though clearly there will be individual variations according to whether the subject has a long flat chest or one of the barrel emphysematous type.

At this point it is not out of place to stress the importance of radiography, and indeed the absolute necessity for antero-posterior films in two planes, for the location of foreign bodies and other abnormalities. The ordinary antero-posterior view may reveal a foreign body lying close to the heart, but it requires a lateral film to show whether the abnormal shadow lies outside the chest or within it.

The anatomy of the ribs and intercostal spaces is important in view of the relationship of the associated vessels. The intercostal space is for all practical purposes a clear and safe area as regards the risk of haemorrhage—a feature that is taken advantage of in aspiration of the chest or when a trocar and cannula are inserted into the pleural cavity. The segmental vessels and nerve are under cover of the lower border of the corresponding rib, and will be injured only if the bone is broken. If it is uncertain whether active intrathoracic haemorrhage is coming from lung and/or chest wall the fact that ribs are intact exonerates the intercostal vessels, but if they are fractured arterial bleeding is a possibility.

Effects of Various Types of Missile

As has already been stated, the effect of a penetrating wound of the chest is variable, but there are certain general tendencies which may be described briefly. A *bullet* produces a small-punctured entry wound, and by virtue of its high velocity drills a clean hole with a minimum of surrounding tissue damage. If it passes through an intercostal space on both sides of the chest it does not make an unduly large exit wound. If, however, a rib is touched an explosive effect is produced and bone is shattered and driven onwards. This impact reduces the velocity and may turn the bullet sideways or even reverse it. The wound track is consequently more extensive and the damage to soft tissues correspondingly increased.

Fragments of bomb are jagged and acquire a tremendous spin, though their velocity is lower than that of a bullet. The effect on the tissues is extreme laceration even though the entry wound may in some instances be small. Pieces of cloth, dirt, and so on are apt to be carried in with the metal and are potential sources of infection, particularly as torn

tissue and blood constitute a fertile soil for bacterial propagation. As against this last statement I must admit that most of the fragments that I have removed from air-raid victims have proved sterile on culture. The lower velocity of this type of missile accounts for so many fragments being retained, and it is interesting to note how often their track ends subcutaneously. Presumably the elastic skin yields at what would otherwise have been the site of exit and does not break. I have seen the same effect inside the chest on several occasions when a fragment has punched a hole in the far side of the chest wall and recoiled within the meshes of the lung tissue, from which it was removed.

Crush injuries may be held to cover damage from falling masses of masonry, direct compression, and the like, and are often responsible for gross and fatal visceral damage without any penetrating wound. Ribs are commonly fractured, several adjacent ones giving way close to the posterior angle. If the bone also breaks anteriorly a whole section of chest wall becomes functionally loose and may be driven in—"stove-in chest"—and may act paradoxically on respiration. Within the chest, lung may be avulsed from its root, and rupture of the heart and great vessels be found.

The effects of "*blast*" have attained some prominence recently, but a full description and an explanation of the findings have not yet been achieved. It would appear, however, that numerous small haemorrhages and effusions occur throughout the alveolar and interstitial lung tissue. Free blood in the air tubes accounts for haemoptysis and also for patches of atelectasis. The distribution of the lesions is erratic, but it is probable that the peripheral areas are most affected, as might be expected when the direct violence of the explosive wave is inflicted on the chest wall. Sometimes it is in the lung fringes that the lesion is well demonstrated, and this may be explained by nipping of the soft tissue between the lower ribs and the diaphragm, which is driven up by the impact on the abdominal wall.

Physiological Considerations

The essential point of the normal physio-mechanics of the chest lies in the fact that two elastic lungs are pulling like evenly balanced springs on each side of the mediastinum. The lungs in turn are held out against the chest wall in a state of tension by the subatmospheric or "negative" pressure in the pleural sacs. If one pleural cavity is violated the underlying lung is released and recoils towards its point of fixation at the hilum. From this point a number of changes in the function of respiration take place.

With the formation of a pneumothorax the balance of the lung pull on the mediastinum is upset and the heart becomes drawn towards the unaffected side, whose tractive force is undisturbed. Inspiration, with general expansion of the chest wall, increases the tension of the sound lung and draws the mediastinum even more towards itself. The result is that with each act of respiration the mediastinum swings to-and-fro or "flutters." The effect of inspiration is to draw air into the unaffected lung, but as it does so it rushes past the bifurcation of the trachea and abstracts some gases out of the collapsed lung. It also means that this lung becomes reduced in size. With expiration the reverse effect occurs and some gases are forced into the collapsed lung, which thus moves paradoxically on respiration.

The movement of gases from lung to lung—the "Pendelluft" of Brauer—results in a steady increase in the CO_2 content and diminution of oxygen, with consequent inefficient and imperfect ventilation of the sound side. The sum of all these factors, if they occur to any marked extent, means that there is actual loss of ventilating surface by collapse of one lung, imperfect exchange of gases, and stimulation of the respiratory centre, besides the effects produced on the circulation by the to-and-fro movement of the heart and great vessels and interference with the venous return.

Puncture of the chest wall or lung may lead to an open pneumothorax, but if the opening is not valvular little harm will result. But, unfortunately, in traumatic surgery it often happens that a ragged external wound through the parietes constitutes a valve and admits more air than can be expelled. Air bubbling and frothing through blood at the skin wound indicates the "sucking" wound that is potentially so dangerous to the respiratory economy. Within the free pleural sac air accumulates steadily—a feature that is made worse by bouts of coughing, which are an almost inevitable concomitant of thoracic injury—and a state of intrathoracic pressure or tension is produced. *Tension pneumothorax* or pressure caused by a haemothorax is a common occurrence in thoracic surgery: the mediastinum is pushed over and encroaches on the ventilation capacity of the opposite lung.

For recognition of this phenomenon there is a physical sign that is often overlooked—namely, the position of the trachea in the neck. The tube is easily palpable in the suprasternal notch, and any deviation is readily apparent. The sign is valuable, since the apex beat and cardiac dullness are sometimes obscured by pleural fluid and are difficult to assess in a patient covered with dressings and bandages. The early recognition of a tension pneumothorax is of the utmost importance, since its neglect may lead to death from direct mechanical embarrassment, whereas its rapid relief could be obtained by putting a needle into the pleural cavity and letting the air escape.

It should also be remembered how tension phenomena can give rise to misleading signs and symptoms. The patient is cyanosed and distressed, and has a persistent cough. Where fluid is present the chest is dull, and on auscultation distant but definite bronchial breath sounds and rales are heard. The diagnosis of pneumonia may be made, but the audible breath sounds are conducted through fluid from a lung completely collapsed on to its root and the rales are transmitted from the opposite side, where the ineffective cough has been unable to expel mucus and secretions. There is no zone of partially collapsed lung to act as a damper between the air current in the bronchi and the chest wall to which the stethoscope is applied. To make an error in diagnosis as described may seem unnecessary, but in a very distressed and mutilated patient it is not always easy to practise the thorough and complete examination which would lead to the recognition of the true state of affairs. One can only emphasize the importance of remembering the possibility of "tension" occurring and deciding whether or not the trachea is in the midline.

Subcutaneous Emphysema

This is a common accompaniment of thoracic injury. The air usually comes from torn lung and is expelled through a breach in the chest wall, but does not escape adequately through an external skin wound even if one is present. The axilla and clavicular fossae demonstrate the typical crackling sensation, and in a severe case the whole head and neck may blow up, making the patient unrecognizable and the eyelids so swollen that he is unable to see. The condition is always more alarming than dangerous, and when it occurs in a crush injury without a surface wound it suggests damage to lung by broken rib fragments.

Haemothorax

The possible origins of blood in the pleural cavity are threefold: the intercostal or internal mammary vessels may be torn, pulmonary vessels may be ruptured, or the heart and great vessels may have been damaged. Clinically it is important to decide whether the bleeding is active or whether it has undergone spontaneous arrest. Section of an intercostal artery is likely to lead to uncontrolled haemorrhage and may therefore require urgent attention but pulmonary haemorrhage, unless rapidly fatal, tends to check itself. The reason for this latter lies in a balance between two groups of opposing factors. On the one hand, vessels in the lung have a wide lumen and the capacity of the pleural sac to receive blood is considerable but as against these features there are the potent influences of the relatively low pressure in the pulmonary circulation and the tendency of the lung to retract and so reduce the actual size of the wound in itself. To put it in another way, blood and air in the pleural sac form a pad which acts against the bleeding area. A haemothorax of several pints capacity is not incompatible with life, though prompt blood transfusions have certainly saved many lives

Blood in a haemothorax has one most unusual character in that it tends to remain fluid in a large number of cases. Infection and tissue laceration may produce massive clotting, but in many instances the effusion shows little if any clot and can be aspirated efficiently through a needle. I have on a number of occasions estimated the haemoglobin and fibrinogen content of both the circulating and the free pleural blood within a few hours of injury. The haemothorax fluid shows on an average a reduction of 35 to 50% haemoglobin and an almost complete absence of fibrinogen. The inference is that the movements of the heart and lungs have whipped up and defibrinated the blood as it wells into the pleural cavity. To account for the reduced haemoglobin figure it is suggested that the blood is diluted by a serous effusion poured out from the pleural endothelium in response to the irritation by blood The amount of clot, if any should be present, is so small that it seems improbable that a concentration of red cells in it would account for the low haemoglobin figure.

Massive Collapse

Massive collapse or pulmonary atelectasis is a feature that is quite often encountered, particularly with a crush type of injury. At first sight it may seem difficult to understand how an injury to one side of the chest can cause collapse on the opposite side, but the present conception of atelectasis as being basically caused by obstruction to a bronchus makes the explanation fairly straightforward Blood or mucus in the bronchial tree may not be removed effectively when the expulsive cough reflex is reduced by shock or pain. The foreign matter obstructs an air tube and as a result of this the gases distal to the block are rapidly absorbed into the blood stream. The alveoli become emptied and their walls fall together so that the affected area of lung is represented by a wedge of bronchi, vessels, and airless connective tissue. This elastic mass now affects the surrounding structures and draws them toward itself. The mediastinum is pulled over, the diaphragm elevated, and the chest wall retracted, and the adjacent lung develops compensatory emphysema. If the atelectatic area fails to re-expand, as it does in some cases, the pull of the elastic fibres is finally directed on the only structures which are left for it to affect—the enclosed bronchial elements. In the early stages the cartilaginous bronchial walls tend to resist the external traction, but the continued centrifugal pull finally results in their stretching and becoming dilated. In short, in any case of persistent collapse bronchiectasis will inevitably follow, and it is a question of later secondary infection which determines whether or not the classical signs of infective bronchiectasis will develop.

Pathological Changes

The pathological changes in traumatized lung are very much what would be expected, laceration and haematoma formation being the principal features. The extensive blood supply of the lung accounts for the fact that many badly torn fragments remain viable though their liability to later infection is considerable. A haematoma of the lung presents as a tense firm swelling of rubber-like consistence and of a purple or violet colour, with the visceral pleura stretched almost to breaking-point over its surface. Extravasation into alveoli produces a condition of consolidation which is demonstrated clinically by stained sputum, which later becomes purulent as the condition resolves. The detailed effects of infection on the lungs and pleura will not be discussed here, though their role in the subsequent fate of the patient is clearly of the utmost importance.

Distant Reflex Complications of Chest Injuries

These complications are often considerable though some of the effects may be attributed to damage inflicted elsewhere in the body. There are, however, certain features associated with what appears to be chest injury alone, and of these retention of urine is the most common and most easily remedied. Acute dilatation of the stomach is apt to be overlooked in its early stages and, if untreated, may cause considerable and serious trouble. Among these abdominal complications may also be mentioned "blast," in which multiple and diffuse haemorrhages in the mesentery and under the bowel peritoneum may result in a fatal peritonitis: I have encountered two such cases accompanying a penetrating wound of the chest.

DANGEROUS DRUGS IN INSTITUTIONS

The Home Office has issued a new Order, to be known as the Dangerous Drugs (Approved Institutions) No. 25 Order (1941), approving certain institutions where persons in charge of laboratories may be in possession of and supply drugs and/or preparations to which the Dangerous Drugs Act, 1920, applies. The institutions named in Schedule A are as follows:

All Universities (including Colleges of Universities) of Great Britain.

The University College, Nottingham.

The University College, Southampton.

The University College of the South West of England, Exeter.

The University College, Glasgow (The Glasgow Royal Technical College).

All Medical Schools recognized by any of the licensing bodies specified in Schedule A of the Medical Act, 1858, as amended by any subsequent Act.

Royal College of Surgeons of England.

The National Institute of Medical Research.

The Royal Veterinary College, London.

The Royal (Dick) Veterinary College, Edinburgh.

The Glasgow Veterinary College.

The School of Pharmacy of the Pharmaceutical Society of Great Britain.

Institute of Chemistry of Great Britain and Ireland.

Approval under the Order will remain in force only so long as the Home Secretary is satisfied that the following conditions are complied with:

The person in charge of the laboratory: (1) shall keep all supplies of the drugs and preparations under lock and key and in his own charge, and shall only issue to persons working in the laboratory such quantities as shall be immediately required in the course of research or instruction; and (2) shall keep records of all amounts of drugs and preparations purchased by him in the forms prescribed in the First Schedule to the Raw Opium Regulations, 1937, and in the Second Schedule to the Dangerous Drugs Regulations, 1937, and shall furnish to the Secretary of State whenever required a copy of these records together with a statement of the amounts of each of the drugs and preparations remaining in his possession.

NATIONAL FLOUR FOR BREAD

M.R.C. SPECIFICATIONS

The following is the text of the Medical Research Council's second memorandum on bread, which sets out the specifications for nationa' flour.

The Accessory Food Factors Committee of the Lister Institute and the Medical Research Council, in a memorandum issued in the summer of 1940, recommended the adoption for bread of a flour of 80 to 85% extraction of the wheat, in the following terms:

> " Flour for the bread of the people should contain the germ of the wheat grain, as much as possible of the aleuron layer, and the finer portions of the bran. Instead of flour consisting of about 70% of the wheat grain, as it does at present, the percentage extracted should be at least 80 to 85%."

Since this recommendation was made the Ministry of Food has decided to make generally available to the public bread baked from flour of 85% extraction. In the original memorandum the nutritional considerations on which the recommendation was based were set out. It now seems desirable to restate them, incorporating the results of further research and defining more exactly the character of the particular 85% extraction flour recommended by the committee.

Special Nutritive Properties of the Flour Selected

The degree of extraction was fixed at 85% in order to secure a flour which should contain: (a) As much as possible of the B vitamins, including riboflavin and nicotinic acid and especially of vitamin B_1 present in the whole wheat. (b) As much protein as possible, including a high proportion of that situated in the outer layers of the grain. This protein is known to possess a higher nutritive value than that contained in white flour. (c) As little bran as possible, so that there should be no risk of loss of nutritive value due to presence of much indigestible material. Wartime diets already contain much vegetable food, with relatively large amounts of roughage; it is undesirable to increase this further.

Production of Flour of 85% Extraction

Flour of 85% extraction can in practice be obtained by two general methods: (i) by rearrangement of the milling machinery to produce a flour containing 85% of the wheat, or (ii) by addition to the white flour (73% extraction), obtained in the ordinary milling processes, of combinations of the other fractions of the wheat.

The consideration which has influenced the final choice of the flour to be adopted has been the need to combine two qualities: first, the best nutritive value; and, secondly, the production of a loaf as little removed as possible in colour, texture, and flavour from that of ordinary white bread. Two flours, prepared respectively by the above methods (i) and (ii), were chosen as possessing equal nutritive value, the first, however, being preferable as fulfilling the second condition most perfectly. Flour (i) was selected as the best for the following reasons:

(a) Of all flours obtained at the same level of extraction by different methods from the same grist, it had the highest vitamin B_1 content, and in this respect closely approached that usually accepted for wholemeal bread.

(b) It had the lowest fibre content compared with other flours extracted at this level from the same grist.

(c) Of all the breads tested, baked from 85% flour, it yielded the one which resembled white bread most closely in flavour and texture.

(d) The colour of the bread was pale brown and was not unattractive.

(e) On technical and on aesthetic grounds the loaf baked from it was considered excellent.

Definitions Proposed for the Selected Flours

Flour (i).—This straight-run flour may be defined as a flour containing 85% by weight of the clean wheat, in which is included (a) the maximum amount of the germ and of the aleuron layer, and (b) the minimum of the pericarp, as shown by its low fibre content.

Flour (ii).—May be defined as (a) containing 85% of the weight of the clean wheat grain, in which is included all the white flour, all the reduction roll tails, mill finish and purifier tails, and sufficient fine bran to bring the amount of the mixture up to 85% of the clean wheat; (b) containing 85% of the clean wheat and excluding 15% consisting of the bran and pollards.

Analyses of samples of flours (i) and (ii) are set out in the table below, with those of white flour of 73% extraction and of wholemeal flour, all four materials being derived from the same grist (water content being 15%).

Flour	Fibre %	Ash %	Protein %	Vitamin B_1 I.U. per gm. (Thiochrome Method)	Calcium mg./100 gm.	Phosphorus mg./100 gm.	
						Total	As Phytic Acid
i (85%)	0.60	0.90	11.4	1.2	27	203	123
ii (85%)	0.85	0.94	11.5	1.15	27	211	123
White (73%) ..	0 to 0.20	0.46	10.6	0.35	15	101	33
Wholemeal (100%)	1.8	1.51	11.9	1.4	36	343	236

Samples of flours (i) and (ii), obtained from the same grist, were found to be similar in content of protein, ash, and vitamin B_1, which in both cases was over 1 I.U. per gramme (thiochrome method). The fibre content of both flours was less than 0.9%, that of flour (i) being lower than that of flour (ii) by about 20%. The lower the fibre content the better is the flour and the more efficient is the milling.

Keeping Properties.—No exact evidence is as yet available regarding the keeping properties of the particular types of flour selected, but from the experience gained of other brown and wholemeal flours there is little doubt that this flour of 85% extraction could be kept in good state under reasonable conditions of storage for four to six weeks or longer.

Recommendation I.—The Accessory Food Factors Committee at its meeting on January 23, 1941, recommended that a flour of 85% extraction, similar to flour (i), should be adopted. Since modification of ordinary milling machinery would be required for production of flour (i), and this would take time, it was further recommended that a flour of 85% extraction, similar to flour (ii), should be adopted in the meantime, as this could be produced without any delay. The flour should not contain less than 1 I.U. of vitamin B_1 per gramme, and the fibre should be less than 0.9% (assuming a water content of 15%).

Addition of Salts to Flour

Calcium Salts.—It is known that the intake of calcium salts in the diets of this country, especially among the poorer classes, is often below the minimum accepted by nutrition experts as necessary for satisfactory growth of bones and teeth in growing children and for maintenance of the bones in adults. The addition of calcium salts to bread was recommended in the previous memorandum issued by the Medical Research Council. It is now possible to add details concerning the amounts required. Wholemeal bread and bread made from flour of 85% extraction contain more calcium than white bread and also more phosphorus. A large proportion of the phosphorus, however, is present in a combination (phytic acid) in which it is not directly available to the organism and at the same time diminishes the availability of the calcium present in the bread and in the rest of the diet. Recent tests made on human subjects for the Medical Research Council have shown that to maintain a sufficient supply of calcium salts for health more calcium salts must be added to the diet. The most convenient way to do this is to add calcium carbonate to the wheat flour used for bread. As a result of the above test on human subjects it has been calculated that additions are needed of 65 mg. of calcium per 100 grammes of white flour (7 oz. of $CaCO_3$ as creta praeparata B.P. per 280 lb. sack) and of 130 mg. of calcium per 100 grammes of flour of 85% extraction (14 oz. of $CaCO_3$ per sack). In the case of the 85% extraction flour the extra 7 oz. per sack is required to neutralize the effect of the extra phytic acid contained in flour of this degree of extraction. It has long been a practice in baking to add similar amounts of substances known as " improvers " (e.g., acid calcium phosphate 12 oz. per sack, or up to 1½ lb. per sack in case of certain self-raising flours at present on the market). The addition of the recommended amounts of calcium carbonate to flour has no effect on the vitamin B_1 content of the flour or on its baking properties.

Recommendation II.—It is recommended that calcium carbonate (as creta praeparata B.P.) should be added to the wheat flour from which white bread is made in the proportions of 7 oz. per sack (280 lb.) of white flour and of 14 oz. per sack of 85% extraction flour.

Iron Salts.—The desirability of adding iron in some form to flour has been considered, the reason being that anaemia due to insufficient iron in the diet is common in this country and could easily and cheaply be prevented by the administration of simple ferrous salts. A study of the available data on this subject has, however, led to the conclusion that the presence of added iron salts in flour might cause destruction of some of the other nutrients present. It is therefore not recommended that any such additions be made until further knowledge on this point is available.

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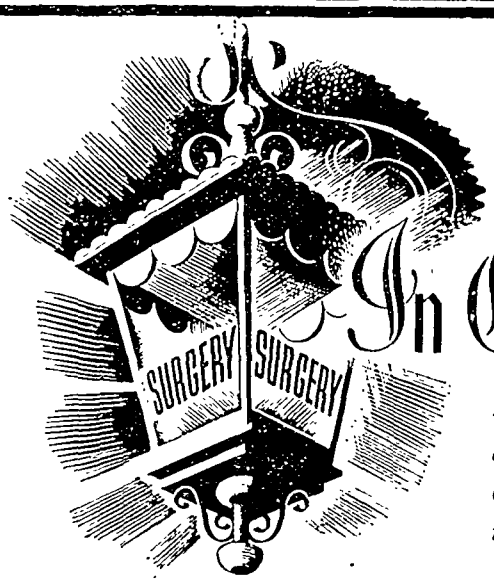
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"*Improvers.*"—The addition of certain "improvers" to bread baked from flour of high extraction facilitates the work of the baker and results in a more attractive loaf. Such evidence as is available does not justify at this stage the prohibition of their use in the baking industry, and the question has therefore been left open.

THE FUTURE OF PHARMACOLOGY

DIXON MEMORIAL LECTURE

The third W. E. Dixon Memorial Lecture was delivered before the Section of Therapeutics and Pharmacology of the Royal Society of Medicine on May 13 by Prof. J. A. GUNN, who took as his subject "The Future of Pharmacology." Sir William Willcox presided.

Prof. Gunn began with a reference to W. E. Dixon, whose researches, he said, were characterized by a wide range rather than deep exploration in a limited field. Dixon was interested in the scope and function of pharmacology, its place in the medical curriculum, and the facilities afforded to it. In one of his last public lectures, in Capetown in 1929, he expressed dissatisfaction with the position of pharmacology, and claimed that it should be a separate discipline in both research and teaching in medical schools.

Was pharmacology still, as Dixon believed, the most neglected branch of medicine? Pharmacological research might be said to have begun, in sufficient volume to matter, about 1870, at a time when the medicinal use of the substances in the *materia medica* was based upon tradition and empiricism. It was right that pharmacological inquiry should devote itself to the examination of the credentials of this heritage of drugs. Chairs of pharmacology and laboratories were established. The search for new remedies was exciting and gave pharmacology a new standing. Many new plants had been investigated, but the most significant change had been the far greater volume of research on new artificial compounds. The preliminary qualitative investigation of the pharmacological action of a plant might be made with simple apparatus and without any high degree of skill; but when it came to the modern search for new remedies, which usually entailed the preparation of a large number of compounds, the conditions were different. The synthetic pharmacologist could never guarantee that any of the new compounds would have new pharmacological properties or therapeutic value, and thus, although it seemed an obvious solution of the quest for new remedies to secure co-operation between the academic pharmacologist and the academic chemist, in fact this had seldom materialized. It might be suggested that the pharmacological laboratory should possess its own chemical annex and synthesize its own compounds, but this would mean duplication of departments, at which universities might look askance. It was not sufficiently realized that the search for new remedies and new synthetic compounds involved chemical synthesis on a large scale. The field must be extensive even if it need not be ploughed deeply. For a university to take up work of this kind was not very practical. The value of the work was apt to be assessed simply by its success in producing a new remedy.

General and Particular Study in Pharmacology

Prof. Gunn next turned to the relations of pharmacology and physiology. Physiology concerned itself with the normal function of living organisms or tissues; pharmacology with the modification of function produced by chemical agents. The methods used in both were the same, and the subjects were so closely allied that it might seem unnecessary or unwise to separate them; but the primary aims were so different that it was well for the two to be regarded as separate disciplines. For convenience and with a certain amount of justification, pharmacological investigation of substances could be divided into two stages: the study of the general pharmacological action indicating which particular organs were acted upon, and the more intensive and qualitative analysis of substances which appeared to show any kind of therapeutic interest. This distinction between general and particular pharmacology was important. There were certain drawbacks to general pharmacology. It meant a wide range of experiment rather than an intensive study of one system. For general pharmacology the pharmacist required a wide training in physiological technique. The primary survey was sometimes despised as superficial, but the superficial analysis was essential, and not necessarily easier than the analysis of what lay beneath. The worker in general pharmacology had to go from one type of experiment to another, relying on his experience and judgment to decide how far it was economical to pursue the experiment in depth. He must have a competent knowledge of physiology, and use methods which, if not the most elaborate, were at least not obsolete. At the end of his labour he might find that the compound which he had investigated showed no kind of physiological interest nor promised any therapeutic value—that is to say, a value superior to that of the known remedies, and as the number of remedies increased it was becoming more difficult to find one which was better than those in use.

On the other hand, research in particular pharmacology offered certain obvious advantages. If a worker confined himself to the action of one particular system of drugs, he required only one set of apparatus and he could limit his reading; as a consequence, pharmacological research workers usually showed a preference for particular research. This resulted in early specialization, which was a mistake. Beginners were apt to be influenced by the glamour of some great physiologist who had pursued investigation in depth, forgetting that he started with a wide range of technique, and only proceeded to deep investigation when he recognized that the conditions were ripe for it. Again, specialized pharmacology soon lost touch with therapeutics.

The Commercial Pharmacological Laboratory

A development which was beginning in Dixon's time but had acquired increasing momentum since was the establishment of commercial pharmacological laboratories. This was a significant development whereby the future of academic laboratories would probably be affected. It began in Germany, but other countries, especially Switzerland, the United States, and Great Britain, followed suit, and now there were in many countries pharmacological laboratories attached to drug factories which for staff, accommodation, equipment, and finance equalled or excelled the resources of the universities. Their primary object was to discover new remedies by the sale of which the manufacturer hoped to recoup himself. Many of the firms, however, engaged in research of a purely scientific kind, and some of these laboratories were doing important work in that direction. When one looked back to Dixon's complaint that practically all the new remedies came from abroad and that British pharmacology was much behind other countries, he thought this was becoming less true so far as commercial laboratories were concerned. There were possible drawbacks to the introduction of drugs from the commercial side, but the therapeutic value of a drug was not in the least influenced by the motives which inspired its discovery. He mentioned the advantages of commercial laboratories—their larger staff of chemists, their ability to get the necessary products from some other branch of the manufacture, their possession of plant which made them able to produce on a larger scale than the laboratories attached to universities. It was significant that most of the newer remedies had come in the first instance from commercial laboratories.

Finally the lecturer turned to the position of pharmacology in the curriculum and the desirability of a special examination in the subject. The scope of pharmacology was sufficiently wide and its outlook sufficiently idealistic for it to be regarded as a separate discipline. Unless this was done and proper arrangements made, it was unlikely that medical students would be adequately instructed in the kinds and uses of drugs.

The first campaign directed wholly against gonorrhœa to be held in a major city in the United States was recently launched by medical and health groups in Rochester, New York. Among the agencies taking part in the campaign are the County Medical Society, the State Department of Health, the Tuberculosis and Health Association, the Rochester Pharmaceutical Association, and the University of Rochester Medical School.

DESTRUCTION AT THE ROYAL COLLEGE OF SURGEONS

Disaster due to enemy action has befallen the priceless collections of the Royal College of Surgeons of England. During a recent raid a heavy bomb fell directly on the Museum of the College in Portugal Street and fire completed the destruction. Although the Lincoln's Inn Fields façade is still erect and seems to have suffered nothing but broken windows, a scene of heartbreaking desolation awaits one in the entrance hall. The famous lecture theatre is a charred ruin, its pilasters just recognizable. The main block of the Library remains, with books still on the shelves. The principal treasures of the Library had been taken away before the end of last year after some damage in an earlier raid, and the same is true of the equipment of the Bernhard Baron research laboratories on the uppermost floor. But the Museum, the greatest treasure of the College, containing possessions such as no national collection could boast, is a heap of rubble amid which the bones of some amphibian or other indestructible curiosity grotesquely project. Many of the specimens had been placed in tunnels below the building, but the fall of the heavy girders of the main structure broke the thick floor and enabled the fire to sweep the basements. Until the work of excavation has proceeded further no exact assessment of the loss can be made, especially as the College records and catalogues, which are always in a state of revision, were also destroyed.

Loss of the Hunterian Collection

Hunter's world-famous collection, which formed the basis of the Museum, may be said to have disappeared. The fraction which remains only serves to emphasize the greatness of the loss. Of the collections illustrating human anatomy not more than twenty specimens have been saved. Large numbers of specimens of human osteology, including anthropological material, have perished. Of 5,200 mammalian specimens illustrating comparative osteology, perhaps twenty or thirty survive, but hardly any of the 3,000 avian specimens or the large amount of amphibian, reptilian, and aquatic material have escaped destruction. Rooms IV and V, built in the middle of the last century, and housing physiological specimens and comparative anatomy, were blasted away. A loss most grievous is the anthropoid room. Specimens brought from the other side of the globe by Sir Joseph Banks and Captain Cook have also gone. The fine collection of primitive Tasmanian skulls and of Australian skulls and skeletons, the original Gibraltar fossil cranium, and the mummy room, containing one of the best collections of mummified material in existence, are no more. The great bulk of the teratological collection (monsters and malformations), numbering over 200, the collection of calculi and concretions, over 500, the collection of trephined skulls, the Onodi collection, and the Cheatle collection of temporal bones are destroyed. The collection of invertebrates, numbering over 2,000, is a total loss. The entire Army Medical War Collection of pathological and other specimens has disappeared, with the exception of Henry Tonks's pictures and one or two specimens which had been moved away after the building was previously blasted. The room containing historical instruments no longer exists; a few of the instruments have been salvaged, but after the treatment to which they have been subjected they are not likely to be of much value or interest. The instruments used by Lister himself are still in a case in the hall. The artificial Roman leg, the old stethoscopes, the illustrations of the evolution of instruments have all gone, and so, it is believed, have Jenner's medicine chest and his silver lancet, and certainly Hunter's furniture.

Specimens that have been Saved

Turning to the brighter side of the picture, Rooms I and II, built in 1888, still stand, although roofless, and the human specimens they contain are almost intact. The Negus laryngological collection has been saved, except for one large wax specimen, and the collection of the Odontological Section of the Royal Society of Medicine, containing about 5,000 specimens, of which the College was the custodian, has also been preserved. Of the anthropological material, a good many of the Nubian specimens still exist, along with the Mount Carmel fossil material. Paget's classical skeletons have been preserved, also the specimens illustrating the comparative anatomy of the brain. The histological section, containing some 12,000 specimens around a nucleus of 200 of Hunter's, is still in existence, and the salvage includes Hunter's great auk, the dodo, and the moa, also specimens illustrating Hunter's experiments on growth, which were in the basement under sandbags. One cares less about the survival of some of the College curiosities, such as the skeleton of the consort of Richard Cœur de Lion and others whose authenticity is by no means beyond doubt, and the Sicilian dwarf and the Irish giant have not much scientific interest. The College statue of Hunter, which was a prized possession, had been bricked up, and has been preserved uninjured—at least the brick erection still stands foursquare amid the surrounding ruins.

An appeal will be made in due course to the members of the medical profession to contribute specimens to a new collection, but the treasures of historical interest can never be replaced. The patient acquisition and labour of a couple of centuries are brought to nothing in a night by an act of such purposeless vandalism as makes one aghast even amid the repeated insanities of war. The act seems to negative that upward thrust of evolution which the Museum so magnificently exemplified. Questions may be asked later why the policy of dispersing the exhibits was not adopted, but in the meanwhile we can only extend our sympathy to the President and Council of the College, and not less to the conservators and curators past and present, to whom the collection was a part of their very lives.

Nova et Vetera

SIR D'ARCY POWER'S LIBRARY

Before the sad news of Sir D'Arcy Power's death reached them many people had heard with regret that Messrs. Sotheby were to disperse the large and valuable collection of medical books which one of the most honoured Nestors of the profession amassed with taste and discernment over the greater part of his long lifetime. The sale opens on Monday, June 9, at 11 a.m.

William Harvey is well represented: it is true there is no copy of the most desirable of all his works, the *De Motu Cordis*, in its original edition, but there are two copies of the first edition in English (1653, Francis Leach for Richard Lowndes). The *De Generatione* is here in the 1651 Amsterdam edition, as well as in the first English edition (1653, James Young for Octavian Pulleyn) and in the Hague edition of 1680. There are two copies of R. Banister's *Treatise of One Hundred and Thirteene Diseases of the Eyes* (1622, Felix Kyngston for Thomas Mann); also an earlier (1586) *Briefe Treatise touching the preservation of the eie sight, by Walter Bayley*, Physician to Queen Elizabeth; this is an especially desirable copy, as it is inscribed by the author to his "lovinge frynde mr John Pophame," who was Attorney-General and treasurer of the Middle Temple. John Browne's *Adenochoiradelogia* is subtitled "an Anatomick-Chirurgical Treatise of Glandules and Strumaes," 1684; it is represented by the first edition and also by another of the same year. With the latter is catalogued Beckett's *Free and Impartial Enquiry into the Antiquity and Efficacy of Touching for the Cure of the King's Evil*, 1722. J. Bulwer's *Philocophus*, or *The Deafe and Dumbe Mans Friend*, 1648, is being offered with some others as one lot. Older than these are J. Goeurot's *Regiment of Life*, black letter, 1550; Alexis of Piedmont's *Secretes*, translated by W. Warde, 1568; Francis Arceus's *Most Excellent and Compendious Method of Curing Woundes*, 1588, with a picture of a surgical boot of surprisingly modern appearance. Andrew Borde's *Breviarie of Health* is listed in three editions—1575, 1587, and 1598. William Clowes is represented by his *Briefe and Necessarie Treatise*, 1585, about syphilis and its treatment by inunction; Paulus of Aegineta by his *Opus Divinum* of 1532. There is also a second edition of W. Bullein's *Bulwarke of Defence Against all Sicknesse*, 1579, which is noteworthy as it has a contemporary calf binding. The *Regimen Sanitatis Salerni* and others of that school are present in more than a score of editions and commentaries, the most desirable, perhaps, being

that of 1480, and an Italian MS. in Latin, also of the fifteenth century; Thomas Paynell's translation into English, 1557, is among those offered. T. Gale's *Workes of Chirurgerie*, 1586, and Roesslin's *Byrth of Mankind*, edited by Thomas Raynold, 1552, have their title pages reproduced in the catalogue. T. Vicary's *Englishe-mans Treasure*, 1586, has bound in with it William Turner's *Rare treasor of the English Bathes*, gathered and set forth by William Bremer, black letter. Another very desirable volume is the first edition of Bartholomew Traheron's translation into English of John Vigo's *Most Excellent Workes of Chirurgerye*, 1543, "wyth the Kynges moste gratious privilege for seven yeares" Mention should also be made of the *Orders and Ordinances for the better Government of the Hospitall of Bartholomew the Lesse*, 1580; and of the *Statutes of 32 Henry VIII*, black letter, 1540, containing "an Act concerning the privileges of phisicions, and an act concernyng Barbours and Surgeons to be of one companie." There are other rare medical books in the collection, which contains also many books not of medical interest and will take a day and a half to pass completely through the hands of the auctioneers *Ekru, fugaces . . .*

Correspondence

Rehabilitation of the Injured

SIR,—The correspondence in your columns following my article on rehabilitation of the injured (April 5) has raised several points to which I feel prompted to reply.

Both Mr. Griffiths and Mr. Butterworth rightly stress the importance of correct psychological approach, and the former raises the question as to whether the methods I described of measuring and recording efficiency in affected muscle groups might not, by focusing the patient's attention on his injured part, induce an introspective state of mind unfavourable to recovery. I have never found any such effect in normally balanced patients—in fact they react in the opposite direction by deriving encouragement and initiative from the evidence of improvement shown in their muscle efficiency charts. In some cases this improvement has been so gradual that the patient would otherwise have been unable to appreciate it from week to week, and these charts have then fulfilled a most useful purpose by preventing those doubts and fears which so often appear in the late stages of serious injury and destroy the patient's will to recover. It is the absence of improvement, either imagined or real, and not the measurement of it, that depresses the patient and causes him to develop psychoneurotic tendencies about his disability. There is another type of case in which the psychoneurosis is a thing apart, quite independent of any physical disability that may or may not exist. These cases are not affected either one way or the other by purely physical methods of treatment and are not suitable for the type of rehabilitation centre I described.

Dame Georgiana Buller raises two very interesting points. She advocates a more comprehensive use of the term "rehabilitation" to include vocational training on the grounds that this is "economic rehabilitation," whereas what we as surgeons are concerned with is physical rehabilitation. There is also a third variety—namely, psychological rehabilitation. It may be desirable to have a general term to cover all three processes, but it is equally desirable to be able to refer to each of them in quite specific terms. Psychological rehabilitation is the province of the psychiatrist; physical rehabilitation is the province of the traumatic surgeon; and vocational training is a matter primarily for workers outside the medical profession.

Dame Georgiana Buller would favour the creation of institutions where all these activities can be carried out under one roof, but I am convinced that this would be a mistaken policy. No seriously injured miner would ever go back to work in a pit if he were presented with any alternative method of earning a living, especially if, as in the example quoted by Dame Georgiana Buller, this also increased his earning power. If his failure to recover held out the prospect of being transferred to another section of the centre where he could be taught to make a living in more pleasant and easy paths, the recovery rate would fall to zero. Very few people become miners from choice, and I imagine the same applies to other industries in which the work is arduous and dangerous and in which there are periodic slumps which affect the workman's security of employment.

The whole success of vocational training depends not simply on learning a new job but on being able to get it afterwards. Otherwise vocational training ceases to be "economic rehabilitation." The best way to ensure that there is always a sufficient number of these jobs to go round is to see to it that there are as few cripples as possible in need of vocational training. This can best be done, as Mr. Watson-Jones so clearly points out, by providing the facilities for complete physical rehabilitation wherever fractures are treated—and the time to do it is now.—I am, etc.,

Mansfield, Notts, May 22. E. A. NICOLL.

Treatment of Peripheral Nerve Injuries

SIR,—In a recent discussion on peripheral nerve injuries at a meeting of the Orthopaedic Section of the Royal Society of Medicine many interesting points were brought up, and among them was the highly satisfactory announcement that in England at least such cases are segregated for treatment in special hospitals. Surely a similar segregation should also be carried out in Scotland. Rowley Bristow said it was necessary for the older surgeons to cast their minds back for some twenty years in order that some elementary mistakes might be avoided. As things are at present much of that experience is not being made use of, as many of the cases are subjected to operation in hospitals which have not the equipment to deal with them. The results are seen in the Ministry of Pensions hospitals. Doubtless few of the hospitals are supplied with a faradic battery or a condenser discharge apparatus suitable for use at operation, and so valuable information is not available at an important stage. The finer muscular movements and sensations are difficult enough to achieve in median and ulnar lesions without adding to these difficulties by delay and doubtful treatment.

In the last war a very thorough training was considered necessary before a young surgeon did any major orthopaedic surgery At Bangour, the Edinburgh hospital, there was the opportunity of the teaching of Sir Harold Stiles, and many long weary hours were spent assisting a splendid team of American surgeons before the personal conduct of an operation was permitted. It is not suggested that such a training is necessary, but if segregation cannot be achieved in Scotland then it is necessary that in the interests of the patient and therefore of the country some form of supervision should be instituted to ensure a uniformly high standard of work.

I believe, however, that all nerve cases should be admitted to orthopaedic hospitals near their own homes before any treatment is carried out—in fact, as soon as diagnosed. I say *any* treatment, because even bad splintage of a few weeks' duration may irreparably damage joints such as the metacarpophalangeal joints of the hand. Following the period of in-patient treatment an adequate after-care scheme will be necessary in which the cases are followed by those concerned in their hospital treatment with physiotherapeutic measures and occupational therapy where possible.

It was an interesting commentary on the vulnerability of peripheral nerves in air raids as compared with war wounds to hear from one of the surgical directors that there were only 0.7% of nerve injuries over a considerable number of casualties in a recent air raid. If this percentage should prove to be correct, then the evolution of a scheme for segregation of cases should present few difficulties.—I am, etc.,

Edinburgh, May 14. WALTER MERCER.

Stirrup Pump Solution: A Warning

SIR,—It has come to my knowledge that solutions of zinc chloride are being sold to the public for attacking incendiary bombs through the stirrup hand-pump. I am informed that these solutions contain about 70% of zinc chloride. It would seem right to issue a warning concerning the use of such solutions, especially in confined spaces. Zinc chloride in the above strength is a corrosive poison, and if some of it got into the eye it would be extremely painful; it would produce temporary blindness, thus immediately incapacitating the operator of the pump; and even if effectual treatment was applied at once permanent damage would be likely to result. I am further informed that when these solutions are brought into contact with burning magnesium, fumes of hydrochloric acid and zinc chloride are evolved. If such fumes are inhaled there may be serious effects in the respiratory passages.

Finally, if such solutions come into contact with the skin and are not washed off they may cause skin lesions.

I am not in a position to express any opinion as to whether such solutions are greatly superior to water in dealing with incendiaries and the fires caused thereby, but I do express the opinion that unless this be so, the possible dangers involved from their use are such that it would appear to be most undesirable to permit the public to have unrestricted use of them.—I am, etc.,

London, W.2, May 19. G. ROCHE LYNCH.

Coventry Revisited

SIR,—After an interval of five months Coventry was again subjected to heavy air raids in April of this year, and the question might be asked, Did the A.R.P. services do better work because of what was learned during the previous devastating raid?

In the raid of November, 1940, the main difficulty of doing any sort of first-aid treatment arose from the fact that the supply of running water, gas, and electric light to the posts failed, and the substitutes for these essential services were not immediately available. Obviously it was necessary to remedy this. After the experience of the November raid a large tank of water, frequently changed, was kept at the post where I am stationed, and it was hoped that the supply thus kept ready would suffice for any one night. In April of this year, when the wardens' whistles were heard, denoting that incendiaries had fallen (a good signal to get busy), the nurse ordered all hot-water bottles to be filled with very hot water, instruments to be boiled, dressings arranged, beds made up, etc. Our preparations were complete before the first casualty arrived, and shortly afterwards the gas supply failed. Lamps were also lit, so that, if the electric light had failed, there would have been little mental shock to the casualties and no pause in the work of dealing with them.

We had, I think, learned something about the better disposal of casualties within the post. Obviously badly wounded and shocked cases were screened off and placed close to radiators, but a first-aid post is not a hospital, and screens are few. We were, however, fortunate in getting two excellent cases early in the evening—an old man and his daughter. They had been buried by debris. They were filthy dirty, but their only complaint was that they both had lost their false teeth. We put them at the side of the ward, facing the entrance, and gave them tea, and until they went to sleep they welcomed every new casualty with a broad edentulous grin, which seemed to say: "Come and join the party. You'll be all right now."

One thing we have still not learned. We have not learned how to remove clothes quickly and painlessly. It is no easy matter to remove a heavy leather overcoat from a man who complains of, say, a pain in his arm. It seems hardly justifiable, and not easy, to cut to pieces a heavy leather coat, possibly to find that the only injury is a mere contusion.—I am, etc.,

Coventry, May 10. NOËL R. HOLMES.

Obscure Nervous Effects of Air Raids

SIR,—The correspondence that has followed upon my letter (April 12, p. 573) stimulates me to venture on some further remarks on the above subject. For to the best of my belief the explanations offered by Dr. H. Crichton-Miller (April 26, p. 647) and Dr. Clifford Allen (May 10, p. 727) do not by any means cover all the cases that I had in mind. They appear to be of the view that the cases of stupor and extreme distress, which I mentioned in my letter, are predominantly or entirely due to physical effects of air raids. I have a certain amount of reason to question this.

Actual studies in a London district and in a coast town, extending over some three months in each case, have shown that depressed morale is not always directly associated with the amount of bombs. There is a tendency for those who are living immediately around an incident to stay put, wherever houses are habitable, better than those living further away from an incident or incidents. There is a tendency for those who have *nearly* been hit to feel that they have had their turn, whereas those who have only seen or heard of others nearly hit feel all the more insecure and that "it's our turn next." This type of reaction can be measured by studies of evacuation, especially of adults from undamaged houses. We hope in the near future to publish a very detailed study of this sort which we have made, where we have related every bomb to the corresponding households, found out how the households have split up or stayed put, attempted to measure the effects on habits, opinions, and morale of those who have stayed through the numerous bombardments.

All this suggests to me—and this is confirmed by a good deal of other research that we (Mass-Observation) have done in the morale field—that it is often those not so directly or physically affected by air raids who are most upset by them. And there do not seem to be as yet any data to justify generalizations such as those made by Dr. Crichton-Miller. I feel that his letter was rather in line with the general medical attitude that stimulated me in the first place to draw attention to this matter. There seems to be a distinct, perhaps unconscious, tendency to gloss over the serious psychological effects that air raids have on people, and to insist that the neurotic effects are negligible.

I have spent practically the whole of the past eight months with a unit of investigators in all the "blitztowns" except Belfast. Apart altogether from the cases of stupor and lethargy I mentioned in my previous letter, I have seen many cases of distress, shock, mild hysteria, and several instances of personal panic. The great majority of people behave with their normal calm and common sense, of course. But no one who has spent any time objectively studying behaviour in the "blitztowns" and getting right in among the mass of the people could shut their eyes—however hard they try—to the very considerable effect that continuous raiding has on people's nervous system, irrespective altogether of the physical impacts. I suspect that the most upsetting factor is *uncertainty*, the intensive insecurity of living in a "blitztown." First, you never know what night the raid is going to come. Secondly, you never know which 'plane noise or other noise is the noise which may mean your end. Too many generalizations have been made from a purely London experience. London is a different story; it is so huge and anonymous. I know from personal experience that it is ten times more unpleasant to be blitzed in a place the size of Coventry or Bristol, where every bomb is personal and every piece of damage is a disaster to one's own town, instead of this great agglomeration of towns which is called London. In London, moreover, those with nervous tendencies have had an invaluable line of retreat, lacking in practically every other city. They have been able to bury themselves underground in the Tubes. The Tubes have provided a safety valve for those who might otherwise have behaved "badly."

There is one other point. The unplanned evacuation which has marked the blitz situation is in itself largely a nervous reaction and one with serious consequences. But the very fact of evacuation relieves the tensions and anxieties which are felt of people stay put. If bombs fall on or near villages to which people already blitzed in a town have evacuated themselves, or if some other highly disturbing circumstances arise, then these people, who have already fallen back as far as they can along the line of physical retreat, may be forced along a further line of psychological retreat. And I think this explains some of the cases I mentioned in my first letter. As I said then, and repeat again, I am only an amateur on this matter. But I do want to insist that there *may* be a genuine problem here, and that if I am right in saying that there is a problem, then it is one which is being neglected. Unfortunately, there is little sign in the correspondence on the subject that anyone intends to do anything else but go on neglecting it. Perhaps the statements on the perfection of our own morale have lulled the medical profession into complacency on this subject? But I hope not.—I am, etc.,

London, W.11, May 14. TOM HARRISSON.

Gas Masks and CO

SIR,—In the article on the diagnosis and treatment of gas casualties in the issue of May 10, should not the first sentence of the concluding paragraph, which reads at present—"The gas-mask, if properly adjusted and in time, gives full protection to the lungs and eyes against all these gases"—have added to it the words, "except carbon-monoxide"?—I am, etc.,

Oxford, May 14. A. G. SANDERS.

Treatment of Burns

SIR,—I heartily agree with Dr. John Gordon (May 17, p. 763) that first-aid posts should use only innocuous substances such as sod. bic. compresses. As medical officer in charge of a first-aid post in my district I have instructed the sister that all cases, no matter how severe the burn should be treated with sod. bic.

The procedure adopted is to clean the burn as best we can (without an anaesthetic). We prick all blisters and wash away all debris (it is surprising how dirty the burns are that we have to treat at first-aid posts); we use an ordinary eye irrigator for this purpose, and again use a sod. bic. solution. A compress of sod. bic. (two to three layers of ordinary white gauze) is then applied and lightly bandaged. A mild sedative such as sod. phenobarb. 1/2 grain is usually given in first and second degree burns (I find there is usually some degree of shock present). In the worst burns with severe shock I give morphine 1/4 grain. All our cases, no matter how trivial are referred to hospital for further treatment.

At one time we used only lot. ac. tannic. or "tannafax" but I found that the personnel (all first-aid workers) were not quite experienced in this form of treatment, and the sod. bic. compress is now the only method of treatment adopted.—I am, etc.,

LOUIS SHELDON,
Medical Officer in Charge, First-aid Post.

Willesden, May 16.

Diphtheria Immunization

SIR,—Surely enough evidence has been collected by now to come to the conclusion that the Schick test is for all practical purposes a reliable guide to a person's susceptibility to clinical diphtheria. I think Dr. Tudor Lewis has elucidated this point well in his recent excellent book on *Diphtheria Immunization*. Some public bodies do not seem to have realized this yet. Only quite recently I had a letter from my boy's public school asking me whether I would agree for my boy, aged 17, to be immunized against diphtheria by two inoculations. There was no mention whatsoever of the Schick test. Actually my boy was inoculated against diphtheria at the age of 5, and was Schick-negative four months afterwards. I took the trouble to Schick-test him again now and found that he was negative. It would have been a waste of time and material to have had him inoculated again now.

I have come to the conclusion that it is worth while to perform a primary Schick test on all children over 5 years of age. I always take the precaution of repeating the Schick test in four months' time on all children under 10 years of age who happen to be Schick-negative in the first place. Having had an opportunity of immunizing a large number of children since January last, I have kept to one definite method and hope to publish my results as soon as I have completed a sufficient number. This may help the medical profession to come to one general standard for diphtheria immunization.—I am, etc.,

H. W. SWANN,
Medical Officer for Diphtheria Immunization for the Boroughs of Hackney and Islington.

May 19.

Sarcoidosis

SIR,—Dr. G. E. Lewis has described an interesting new case of uveo-parotitis (April 12, p. 552), but his conclusions call for comment. The case is described as one of Adie's syndrome, which it may well be, but there is no description of myotonic pupil reactions; the patient may, of course, have been an atypical example of the syndrome, or in an atypical phase, but there may be another explanation for the pupil changes and tendon areflexia. Were the pupils fixed as a result of a previous attack of irido-cyclitis? In uveo-parotitis the formation of synechiae is very common and no reference to their presence or absence is made. Other unequivocal evidence of involvement of the *central* nervous system is lacking (the areflexia may have been of peripheral origin) and the claim for "visceralization" is too strong. Dr. Lewis describes the development of uveo-parotitis, with the usual histological changes, and quite rightly states that this syndrome is now generally recognized as part of a much more diffuse disorder, for which the term "sarcoidosis" is as good as any other at present. But to claim that no case of this condition ("sarcoidosis of Boeck") showing neurological signs or symptoms has previously been reported is a little surprising. Before the relationship between uveo-parotitis and Schaumann's disease (Schaumann was the first to show that Boeck's sarcoid of the skin was part of a widespread disorder) was realized, it was well known that facial palsy was one of the common signs of the former and that widespread polyneuritis, of varying degree, was not uncommon. Undoubtedly examples of involvement of the central nervous system have been admittedly rare, but Waldenstrom (*Acta med. Scand.*, 1937, 91, 53) reported a remarkable case in which typical uveo-parotitis was complicated by a gross cerebral and possibly spinal disorder; and there have been others, probably including some of those described as "encephalitis lethargica associated with parotitis."

As our knowledge of the clinical picture of sarcoidosis increases it is becoming evident that practically every tissue in the body may be involved, and there is no reason why the brain and spinal cord should be exceptions. On the other hand, I do not think Dr. Lewis's case is sufficiently strong to form the basis of a claim that sarcoidosis bears any relationship to Adie's syndrome.—I am, etc.,

Leeds, April 26. HUGH G. GARLAND.

Undergraduate Teaching in the Municipal Hospitals

SIR,—Mr. Somerville Hastings in his article on post-war medical education in London (May 3, p. 678) has rightly called attention to the opportunities for undergraduate teaching which exist in the municipal hospitals.

At the time when we were students these hospitals were used, as he states, solely for courses in "fevers" and a few attendances at a mental hospital. I feel sure that there would have been insuperable difficulties against extending the teaching at that time, and that the same situation continued until after the last war. But between 1919 and 1939 municipal hospitals improved out of all recognition both in equipment and in the standard of the personnel, with a resulting advance in the clinical work of the hospitals. Mr. Somerville Hastings dismisses in three lines the undergraduate teaching in municipal hospitals in 1939, and this certainly underestimates the position and the progress which was being made. My own hospital, St. Thomas's, is very fortunate in the municipal hospitals in the vicinity, but other teaching hospitals also were taking similar steps. For some time, perhaps not more than two or three years before the present war, we had been rapidly establishing contact with the municipal hospitals, and we were invariably met more than half-way, both by the staff of the hospitals and by Sir Frederick Menzies and Dr. Daley at County Hall. Members of the personnel of municipal hospitals have been placed on our hospital committees, and teaching facilities in these hospitals and arrangements for further developments were advancing steadily. By no means all the teaching was undertaken by the staff of St. Thomas's Hospital. A clinical round in a municipal hospital taken by the superintendent or a senior medical officer would attract, voluntarily, fifty or sixty students. This was partly a tribute to the teaching powers of the personnel, but it was also due to a realization by the students that they would see a type of clinical material which could not be sufficiently represented in a teaching hospital, a point to which Mr. Somerville Hastings rightly calls attention. But I would not entirely agree with him in comparing this material to the ordinary everyday cases of general practice. Unfortunately a knowledge of such everyday cases can be acquired only in general practice, and the Committee on Education of the B.M.A. failed to find any practical method by which this knowledge could be gained before qualification.

This evolution, which was proceeding throughout London, and no doubt elsewhere, with increasing momentum, was interrupted by the revolutionary episode of war. A large number of medical students were suddenly thrown into municipal hospitals that were scarcely prepared for them and had had little voice in the arrangements. Some temporary dyspepsia and anorexia may have resulted, but close contact has been established, and we may be sure that the advantages will outweigh the disadvantages. Nevertheless, even if nothing were learnt from this upheaval, the evolution which was already in progress before the war would undoubtedly continue. The municipal hospitals and the teaching hospitals both realize the

benefit which would accrue from such liaison, and have been moving together with friendship and good will.

Much more remains to be done, but I am sure that Mr. Somerville Hastings will welcome the information that the movement had already progressed so far.—I am, etc.,

London, W.1, May 15. H. LETHEBY TIDY.

American Doctors for Britain

SIR,—I am much interested in this subject now before the profession from an experience during the last war, when I occupied the position of chairman of the Recruiting Medical Boards for Cumberland at Carlisle, where thousands of men were examined. I have no hesitation in expressing the view that the present arrangements are superior to 1914-18, and if they were effected to the full there should be little need for the emergency call for 1,000 American doctors at this time. But it is not so, for although a large number of available British doctors have already registered in the ordinary course comparatively few have been posted to date.

During the recruiting period of the last war applications for posts on Medical Boards were received from qualified men hailing from several other countries, and a number were accepted, but temperamental variation and habitude barred the way to good co-operation and harmony; acute friction resulted with consequent resignations, with the result that the whole clinical system extant suffered acutely. I would like to be informed why so many English doctors, quite dispensable for service, under the age of 30 have not been called up and are enjoying seclusion in their own practices. I am satisfied that if the committees in authority for absorbing all the available medical man-power were exhaustively conducted, there would be little need for the emergency call to the Western Hemisphere, initiating an anomalous position. During the last war medical man-power was reduced to an absolute minimum, and only a fraction of the medical community was left to carry on medical practices—in fact, a dangerous position was reached. At the present time, however, the general health of the nation is good, and the vital intelligence of the people is such that this should be maintained for the remainder of the war.—I am, etc.,

C. W. GRAHAM, J.P.,
Ex-President of the Border Counties
Silloth, May 13. Branch, B.M.A.

Medical Man-power

SIR,—I should like to make the following observations on the subject of medical man-power.

1. Doctors of military age are being reserved on account of large panel practices.

2. Doctors whose names are being forwarded by Local Medical War Committees are not being called up. This excludes members of the E.M.S., of teaching staffs, medical officers of health, etc., who are automatically referred to the Central Medical War Committee.

3. As chairman, Local Medical War Committee, City Area, and of Holloway No. 5 Medical Board, I am in touch with many men from widely separated areas. I am told the same story in each case. Hundreds of medical men in London are facing bankruptcy because they have nothing to do.

4. Final-year students are replacing doctors.

5. A thousand U.S.A. doctors and 1,400 aliens are ready to relieve pressing need.

6. One must assume that the central body is *au fait* with conditions in London.

7. There is, in fact, a reserve of British medical man-power available in London waiting to be used.—I am, etc.,

Hampstead, May 9. JAMES FETTES.

SIR,—From letters to the *Journal* and from its advertisement columns it is obvious that the country's medical services are in an unsatisfactory state, which urgently calls for improvement. On the one hand, we have doctors in the raided evacuation areas suffering severely from insufficient work; on the other, doctors in reception areas clamouring for assistance rarely forthcoming.

Is the explanation that the former, often elderly men and women with considerable liabilities, feel that they, should they leave their district, have no protection for the nucleus to which the practice of each has been reduced, or is there some other explanation, possibly also financial? One may be willing in the present emergency to take what offers, but these assistants will many of them be doctors of considerable experience, and their services have, or should have, a much greater financial value than those of the peacetime newly qualified assistant.

A State Medical Service may be inevitable, but in that case it is important that nothing should be done now to encourage the development of a too cheap service. I must admit, however, that the salaries offered in many cases are by no means low.

The matter is urgent. Can anyone offer a reasonable, helpful suggestion? The introduction of American doctors may have its merits, but should not be necessary.—I am, etc.,

London, W.8, May 19. HAROLD H. SANGUINETTI.

SIR,—In the *Journal* of May 10 are letters under the headings "Medical Man-power" and "Overburdened Doctors in Reception Areas," but I have so far failed to see any reference to the unfortunate position of medical men in what might be called voluntary evacuation areas such as Brighton. Our patients of substance have long since left for safer areas. Our male and female panel patients are either called up for the Services or are being drafted into factory work or are seeking domestic service in hotels and houses in reception areas. This reduces one's income to a dangerous level. Add to this the fact that one's partner, a man of considerable experience, is called up to the R.A.M.C. as a lieutenant, instead of as a captain, with commensurate pay to his rank and knowledge, and things are far from rosy! Whereas doctors in the reception areas are truly overworked, and presumably are deriving a welcome increase in remuneration whether they desire more work or not.

Before calling on doctors from America surely use should be made of those of us who are not overworked. After all, charity should begin at home. Why cannot the profession sponsor a pool of medical men from distressed areas and money from reception areas, so that we may all live under more favourable circumstances with less monetary worry?—I am, etc.,

Brighton, May 18. F. HUGO STUTTAFORD.

Overburdened Doctors in Reception Areas

SIR,—Dr. Sophia Graham in a letter (May 10, p. 727) writes concerning the difficulty of obtaining help for overburdened doctors in reception areas. Though compulsorily out of the fray myself, I hope it may not be presumption to state that a great difficulty is the natural reluctance of senior men to accept positions usually held by junior men, and the natural reluctance of the general practitioner to invite a senior to accept such a position where the senior's professional skill, or in some cases social prestige, will have but little outlet or appreciation. General practice (without increase in insurance capitation fee) does not admit of payment of large salaries for assistance, but ought salaries, position, or the diversion of specialist services for a time to be a difficulty? The B.M.A. has, by its fund for temporarily distressed doctors, presumably a list of doctors willing to take work without strict regard to their professional earnings and position in the past, and there should be just as much honour in accepting altered professional conditions as in the fighting Services, where there are thousands of brilliant men who have had to forgo their normal careers and sacrifice position and earnings.—I am, etc.,

Tavistock, Devon, May 19. FRANK BRYAN.

Medical Certification

SIR,—As a factory medical officer it has been my experience that the lessons of the last war have not been appreciated by the medical profession. It was then common knowledge to factory managements that medical certification, especially in T.N.T. conditions, was not of a very high standard. The following two experiences of mine might illustrate what is happening to-day.

Certificates were sent in to the factory stating that an employee was suffering from bronchial asthma due to T.N.T. poisoning. When I saw the employee at the factory surgery I considered that she was suffering from pulmonary tuberculosis,

and referred her to the tuberculosis clinic, who confirmed this, and stated that they had found tubercle bacilli in her sputum. From the other angle, I had a certificate from a doctor to say that a patient of his who had been medically rejected was perfectly fit and healthy, although he stated she had a swelling of the thyroid. This woman was suffering from thyrotoxicosis, and I consider such a condition should be under medical care, and anyone suffering from it is certainly not a fit subject for work with T.N.T. This her doctor disputed.

Diagnosis of T.N.T. poisoning by the factory medical officer is not an easy matter. Our employees whom we suspect are suffering from T.N.T. poisoning have a very extensive examination, which includes blood-pressure reading, Webster urine test, blood count, and examination of stained blood films over and above a physical examination.

It is the earnest wish of factory medical officers that full co-operation between the patient's own doctor and the factory should be established, and it is my desire in this letter to be constructive and helpful. If the panel practitioners are in difficulties regarding their patients whom they presume to be suffering from T.N.T. poisoning, we will do our utmost to assist them, if they communicate with us.—I am etc

May 14. J. H WATSON

SIR,—I was interested to read Dr. J. B. Wrathall Rowe's letter (May 10, p. 732) in which he expresses his views as a factory medical officer on the question of the acceptability of many certificates of incapacity. Recently this subject gained singular importance when a magistrate refused to accept their validity. That the medical certificate should thus fall below the status of a legal document is a matter for concern.

The task of the practitioner is not an easy one when dealing with these applications. He is unable wholly to disregard statements by patients, and in many cases must grant a certificate while lacking proof of their veracity. For example, a man may come to the evening surgery requesting such a document on the grounds that he was incapacitated that day by diarrhoea. Many patients do not appreciate the responsibility incurred by the doctor in granting a certificate, particularly in insurance and contract practice. It is beyond their comprehension that their doctor, for whose services they have contributed weekly payments, should hesitate to sign his name to any statement requested of them by employer, employment exchange, or school authority, etc. Certificates which were "ludicrous in the extreme" may have been issued as a means of avoiding prolonged argument during a busy surgery.

Under war conditions a number of new types of medical certificates are now demanded by Government Departments and local authorities. As a result of these certificates and coupons, a complex appears to have arisen which is rapidly leading to abuse. Some retailers of foodstuffs seek to solve the difficulty of distributing scarce commodities by requesting a medical certificate. In consequence of all this patients are tending to regard the surgery as an additional coupon office.

To end such abuses the medical certificate must be issued under stricter control. The patient must also be made to realize that all certificates cannot be demanded as a right. One way would be to charge a nominal fee in the form of a legal stamp, already customary with legal documents. A postage stamp could, for instance, be affixed to existing printed forms. Other certificates, including that of incapacity, could be supplied in printed book form with embossed Inland Revenue stamps, a practice already familiarly used. The annual yield to the Treasury from such a duty would be considerable, and the present time seems most appropriate for its introduction. As a result of the legalized formality of such an arrangement, the patient would tend to appreciate something of the nature of his request. The cost to be incurred would perhaps minimize unnecessary applications. A practitioner's refusal to accept payment for an unworthy application would be better understood than by a lengthy explanation. In some areas it is already the practice to charge a fee when issuing certificates, and it would be an advantage if a fixed charge could be agreed upon which would include the stamp duty.—I am, etc.,

May 20. R. H. GREIG.

SIR,—In the past few days I have signed certificates as follows: (1) for corsets; (2) to exempt fire watchers suffering from disease; (3) for extra milk; (4) to exempt from military service men passed as Grade I suffering from tuberculosis and Hodgkin's disease; (5) for one of two special types of gas-mask—only one of which is actually available. Surely it is time the B.M.A. took a hand in abolishing this certificate mania.

Apparently in the case of the extra milk the certificate must be signed every month; presumably to the official medical mind tuberculosis is a disease of a month's (or less) duration. Coupled with the recent warning of the G.M.C., and the fact that the nature of the person's illness has to be disclosed to clerks and dairymen, it is evident that the practitioner's word is not to be trusted, as he is warned by the judge—namely, the disciplinary body—and has to explain himself to the jury—the clerks and dairymen. I feel sure I am expressing the feelings of my colleagues, and hope you will publish this in your columns, which are our only mouthpiece.—I am, etc.,

Cottingham, E. Yorks, May 14. R. D. B. WRIGHT.

The Phoenix Number

SIR,—May I offer my congratulations on the production of last week's *British Medical Journal*, dated May 17, and its publication at the usual time? I wondered how you would do it, and I still do not know—it is a great effort.—I am, etc.

W. K. FITCH,
Editor, the *Pharmaceutical Journal*.

London, W.C.1 May 22.

The Services

CASUALTIES IN THE MEDICAL SERVICES

ROYAL ARMY MEDICAL CORPS

Captain FRANK ROBERT OLIVER HAYWARD died suddenly at Gutting Grange on May 19. He received his medical education at Guy's Hospital and qualified M.R.C.S., L.R.C.P. in 1932. He had held the post of house-physician at St. Bartholomew's Hospital, Rochester and before the war was in practice at Chelmsford where he was honorary anaesthetist to the local hospital.

Prisoner of War

Major Alastair Gordon Donald Whyte, M.B.E.

DEATHS IN THE SERVICES

Major-General ALEXANDER ARTHUR SUTTON, C.B., D.S.O., late R.A.M.C., died at Tunbridge Wells on May 12, aged 79. He was born on November 30, 1861, took the L.R.C.P.Ed. and L.R.F.P.S.G. in 1884, an entered the Army as surgeon in 1885. He became colonel in 1915, major-general in 1917, and retired in 1920. He served in the campaign in Sierra Leone in 1898-9, when he was severely wounded (West African medal with clasp); in the South African War in 1899-1902, taking part in operations in the Orange Free State, including the actions of Paardeberg (wounded), Poplar Grove, Karnee Siding, Vet River, and Zand River; and in operations in the Transvaal including actions at Pretoria, Johannesburg, and Diamond Hill, was mentioned in dispatches in 1901, and received the Queen's medal with four clasps, the King's medal with two clasps, and the D.S.O. He also served in the war of 1914-18, when he was twice mentioned in dispatches in 1916 and received the C.B. He also received the Serbian Order of St. Sava (Third Class) for services at Salonika in 1917.

Lieutenant-Colonel MICHAEL DAVID AHERN, O.B.E., R.A.M.C. (ret.), died in Dublin on May 10, aged 64. He was born on September 6, 1876, the elder son of the late Mr. T. Ahern, J.P., of Glanmire, County Cork, was educated at Queen's College, Cork, and at the Cecilia Street Hospital, Dublin, and took the Scottish triple qualification in 1902. Entering the R.A.M.C. as lieutenant in 1904, he became lieutenant-colonel in 1920, and retired in 1931. He served in the war of 1914-18 and received the O.B.E.

The Federal Department of Health in Mexico has been reorganized under the new administration with Dr. Victor Fernandez Manero chief of the Federal Department of Health, Dr. Mario Quinones Secretary-General, and Luis Bobadilla in charge of the office.

Obituary

SIR D'ARCY POWER, K.B.E., F.R.C.S., F.S.A.

Surgeon and Medical Historian

As briefly announced in our last issue, Sir D'Arcy Power, surgeon, medical historian, biographer, and librarian, died on May 18 at his home at Northwood, Middlesex, to which he had lately moved after many years in Chandos Street, Cavendish Square. He was spared the news, made public a day or two after his death, of the damage caused by enemy action to the Royal College of Surgeons and its possessions which he had served so devotedly for over half a century. No English surgeon has ever been held in more affectionate regard in his own and other countries.

D'Arcy Power was born in London in 1855, the son of Henry Power, who died in 1911 at the age of 82, after serving St. Bartholomew's as ophthalmic surgeon for most of his working life. In a tribute to his father D'Arcy Power once wrote that his versatility, friendliness, and courtesy showed his Southern Irish ancestry, and his dogged perseverance was derived from a Dutch and a Quaker strain. Certainly the same qualities, however derived, were characteristic of the son. He was educated at St. Marylebone and All Souls' Grammar School and later at Merchant Taylors' in the City, where, at 17, he was awarded the prize as the boy best fitted for a merchant's office. This fate was averted, and he matriculated at Oxford, from New College, in 1874, and obtained an open exhibition at Exeter College in 1877. He then became demonstrator to the University, lecturer on physiology at Magdalen, gained a first-class in the honours school of natural science in 1878, and proceeded M.A. in 1881.



In 1878 he entered St. Bartholomew's, with which he was to identify himself as one of its most beloved and devoted sons. In a lecture given in later life, after recounting the jealousies and rivalries of the older Bart's, he described how when he came to the hospital as a young man of 23 he found himself among a "most intelligent body," who at once appointed him a teacher, invited him to their Christmas dinner, and told him they had given him the opportunity of winning his spurs should he be so inclined. The whole staff of the hospital, which then numbered twenty-eight, were his good friends. The teaching post to which he was assigned was that of assistant demonstrator of physiology. In 1882, the year of his qualification, he became house-surgeon to Sir William Savory. He once recalled that at the time he was assisting Savory in the theatre a single pair of forceps was alone provided to arrest bleeding even in so large an operation as amputation of the thigh.

His entrance into consulting practice may be said to have dated from 1885-6 when he was appointed surgeon to the Metropolitan Dispensary and assistant surgeon to the Victoria Hospital for Children. He retained the post of curator to the museum at St. Bartholomew's, and from 1889 to 1901 he was demonstrator of practical and of operative surgery at that hospital, and of surgical pathology from 1901 to 1904. Like John Hunter, he took an interest in comparative medicine, and from 1890 to 1903 he lectured on histology and physiology at the Royal Veterinary College. In 1898 he was elected assistant surgeon at St. Bartholomew's on the resignation of Sir Thomas Smith, and he became full surgeon in 1904 on the resignation of John Langton. This position he held until 1920, when he was made consulting surgeon. He had the reputation of being a good all-round surgeon who showed at his best in an emergency operation.

His election to the Fellowship of the Royal College of Surgeons had taken place in 1883, the year after he qualified. Six years later he had become an examiner in physiology for the Fellowship, a position he held for thirteen years. In 1896-7 he was Hunterian professor of surgery and pathology. He became a member of the College Council, at the same time as the late Lord Moynihan, in 1912, was re-elected in 1920, and made vice-president in 1921, and again in 1922. In 1919 he was Bradshaw Lecturer, in the following year Vicary Lecturer, and in 1925 Hunterian Orator. He represented the College on many important bodies—the Imperial Cancer Research Fund, the University of Bristol, and Queen Victoria's Jubilee Institute for Nurses among others—and he was the College delegate at the International Historical Congress in London in 1913, the centenary celebrations of the Académie de Médecine de Paris in 1920, and the opening of the Royal Australasian College of Surgeons at Melbourne in 1935. Of the many offices he held at the College, one, that of honorary librarian, was created for him. No one had greater knowledge of the treasures of the library or spent more time in its precincts. He was also at various times examiner for the Universities of Cambridge and Durham, Queen's University, Belfast, and the National University of Ireland.

But it is as a writer that Sir D'Arcy Power has the largest of his many claims to remembrance. His first published writing appeared in 1877. It was entitled "On the Albuminous Substances which occur in Urine in Albuminuria," and was written with Sir Lauder Brunton for St. Bartholomew's Hospital Reports. His first book, a manual for the physiological laboratory, written with Dr. Vincent Harris, was published within the next five years. His first clinical paper, notes on a case of congenital locomotor ataxia, from the wards of Dr. Samuel Gee, bears the date 1882. His first venture into the history of medicine was his admirable edition of South's "Memorials of the Craft of Surgery" (1886), prepared at the request of Sir James Paget, who wrote an introduction. This was followed by a long series of unsigned historical articles in the *British Medical Journal*. He "kept his head above water," to use his own phrase, by "devilling" for Ernest Hart, the then Editor, whom he described as a master in the art of extracting "copy" in the form of articles and abstracts at a moment's notice. Hart's encouragement, and not less his criticism, which was sometimes caustic, served the literary apprentice in good stead. Since those early days we are glad to have published under "Nova et Vetera" or other title many an attractive and scholarly note from his pen, not to mention a large number of articles on clinical subjects and many reviews of books.

In 1931, on his seventy-fifth birthday, and on the initiative of the Osler Club, Sir D'Arcy was presented by subscribers with a volume of his "Selected Writings." To that volume is appended a short-title bibliography of his contributions to literature; it contains more than 600 entries. Many of these are short "lives" of medical and other worthies in the *Dictionary of National Biography*, to which his first contribution was made in 1893. In addition to biographies he wrote numerous articles on historical subjects connected with medicine, more especially the medicine of the sixteenth to the eighteenth century in England. In all this research and writing he was far from being the mere specialized antiquarian. He had a keen sense for the quaint and amusing, and a turn of his pen would give a bygone incident or practice its full human quality. The patience and skill which he displayed in illuminating the byways of medical history are illustrated in his presidential address to the Medical Society of London on "John Ward and his Diary." John Ward was a medically minded parson of Stratford-on-Avon in the seventeenth century, and the address was the outcome of four years' work off and on, in transcribing sixteen small books of crabbed writing. In these out-of-the-way fields Sir D'Arcy Power was just as eager and inexhaustible as when he was on the more open ground of the work of Harvey and of Hunter, the history of hospitals, and the craft of surgery. One of his most valuable pieces of medical biography, carried out with the help of his colleagues, W. G. Spencer and G. E. Gask, was his revision of the biographical notices of the Fellows of the Royal College of Surgeons from 1843, when the diploma was first instituted. These had been drawn up with great patience by Victor Plarr, librarian of the College for many years, but never published in his lifetime. The work was brought up to date by D'Arcy Power and prepared for publication in 1930.

But it must not be supposed that he employed his writing only on historical subjects. He wrote extensively on cancer and on the surgery of the abdomen. Thus the bibliography above mentioned includes 77 articles on abdominal surgery, 39 on malignant diseases, 23 on orthopaedics, 12 on intussusception. Scarcely a number of the *British Journal of Surgery* appeared from 1913 onwards without some contribution from him. In 1895 he wrote his "Surgical Diseases of Children," and in 1915 an Oxford primer on "Wounds in War," and he was co-author of a "Handbook of Surgical Pathology" and a work on "Diseases of Joints."

No man was better known in the medical society life of London. He had been president of the Medical Society, the Harveian Society, and the Sections of History of Medicine and of Comparative Medicine of the Royal Society of Medicine; he was on the council of the Pathological Society and the British Orthopaedics Society. He had become a member of the British Medical Association in 1892, and was a sectional officer at various Annual Meetings and president of the Section of Surgery in 1926. He was corresponding member of several foreign societies, and one of the secretaries of the National Committee for the four International Congresses of Medicine which were held in various capitals between 1900 and 1909. He was vice-president of the London meeting of the International Society of the History of Medicine in 1921 and honorary president of the Geneva meeting in 1925. In 1938 he was honorary president of the International Society of Surgery. In 1924 he went to America, was for two months visiting surgeon-in-chief of the Peter Brigham Bent Hospital, Boston, and was made an honorary Fellow of the American Surgical Association at Baltimore, where he delivered an address on "How the Tradition of British Surgery came to America," with some information about the earliest English teachers to cross the Atlantic in the late eighteenth and early nineteenth centuries. In 1930 a small work of his, "Medicine in the British Isles," was published in New York.

Many societies outside medicine claimed his interest. He was the founder of the Samuel Pepys Club; he wrote a delightful medical history of Mr. and Mrs. Pepys, discovered who performed lithotomy on Samuel, and even prescribed glasses which would have enabled him to continue his diary. He was a prominent figure in the Society of Antiquaries and the Bibliographical Society, and was great among the Freemasons, founder of the Rahere Lodge at St Bartholomew's. The building of the new Freemasons' Hospital at Hammersmith was a project near to his heart. The writer of this notice remembers being conducted round that building by Sir D'Arcy, who, in spite of his lameness and of entreaties not so to fatigue himself, insisted on accompanying his visitor to every floor and out on to the roof.

Many other activities in this full life can only be mentioned—his work for many years on behalf of the Royal Medical Benevolent Fund, as visitor for King Edward's Hospital Fund for London, as chairman of Pinewood Sanitorium, as member for eighteen years of the Faculty of Medicine of London University, as member of the Board of Management of the Metropolitan Convalescent Institution. Even eighty-five years seems too short to crowd in all this activity.

At the outbreak of the last war he became lieutenant-colonel R.A.M.C. (T.) and was officer in charge of the First London General Hospital (T.F.), and later on of its Surgical Division. He was also consulting surgeon to the military hospital at Bromley and surgeon to the Officers' Hospital at Fishmongers' Hall in the City. It was for this relatively brief service in military uniform, not for his lifetime in the library, that he received his knighthood in 1919.

In 1882 he married Eleanor, daughter of G. H. Fosbroke, M.R.C.S. of Yorkshire, who died in 1923. One of his sons was killed in the second battle of Ypres in 1915; the other, Group Captain D'Arcy Power, is in the R.A.F. Medical Service.

Long as is the catalogue of his achievements and distinctions and manifold as are his contributions to the lore of medicine, the outstanding thing which those who knew him will recall will be his unassuming friendliness, his cheery disposition, and his real beauty of character.

A note on some outstanding items in Sir D'Arcy Power's personal library, which he had instructed Messrs. Sotheby to sell next month, will be found at page 830 of this issue of the *Journal*.

[The portrait reproduced is by Lafayette.]

W. H. GIBSON, M.B., AND L. F. SKINNIDER, M.B.

We regret to announce the deaths, through enemy action, of two Paisley practitioners, Dr William Hamilton Gibson and Dr. Leo Francis Skinnider.

Dr. Gibson graduated in medicine at Glasgow University early in the last war and served with the R.A.M.C. at home and abroad. On demobilization he took over the old-established practice of Dr. William Russell of Paisley. He soon began to take an interest in public affairs, and for some years served on the town council, resigning in 1930, under the conditions of the new Local Government Act, on his appointment as visiting physician to two hospitals of the local authority—Craw Road and Auchentalie. He was elected to the magistracy in 1928. He was examiner to the St. Andrew's Association, lecturer to the Provident Co-operative Ambulance Corps, honorary surgeon to the Boy Scout movement and the leading figure in the local branch of the British Legion in its work in helping men who had served in the last war. He had been chairman of the Panel Committee and he was a member of the British Medical Association, having been elected in 1921. Another of his activities was his directorship of the Royal Victoria Eye Infirmary, the chairman of which at a meeting of the directors following his death, spoke of the great indebtedness of that institution to Dr. Gibson for his thirteen years' service.

Dr. L. F. Skinnider was a rather younger man. He graduated at Glasgow in 1924 and had been for fifteen years in practice in Paisley, where his father, the late Mr. A. S. Skinnider, was for a great many years a well-known journalist. He also was a member of the Paisley Panel Committee and since the time of his qualification, of the British Medical Association. Both men were highly respected in the local community, especially by their medical colleagues, and their tragic death is keenly felt. Dr. Gibson is survived by his wife and three children; Dr. Skinnider, who was a widower, by two small sons.

The sudden and tragic death of WILLIAM GRAY, caused by enemy action in Liverpool while carrying out his duties, was a great shock to his many friends in Edinburgh. He came from Canada in 1927 and graduated in Edinburgh in 1932. As a student (writes G. L. C.) he acted as one of the unqualified assistants in my surgical clinic in 1930. After graduating, the managers of the Edinburgh Royal Infirmary appointed him, at my request, resident house-surgeon to the wards under my charge. On the termination of this appointment, Mr. Pirie Watson, who, as assistant surgeon, had seen his good work, appointed him resident surgeon at Leith Hospital. Not content with a year of hospital work after graduation, Gray then went to Liverpool and specialized in orthopaedic surgery, obtaining the M.Ch.(Orth.) degree in Liverpool in 1937. Two years later he obtained the Fellowship of the Royal College of Surgeons, Edinburgh. At the time of his death he was deputy medical superintendent, Mill Road Infirmary, Liverpool. William Gray's record since graduation, so far as work is concerned, speaks for itself, but he had something more than ability—a charm, difficult to define, due to a bright personality, a lovable disposition, and a quiet musical voice, all of which endeared him to those who knew him. A promising career has been ruthlessly cut short. The deepest sympathy of all his friends is extended to his widow and his parents in Canada.

Dr. JOHN SLIGHT GRAY has been reported killed by enemy action in April, 1941, aged 28. He was the younger son of Mr. and Mrs. George Gray, of Riselaw Crescent, Edinburgh, and took the M.B. and Ch.B. at Edinburgh in 1939.

Universities and Colleges

UNIVERSITY OF LONDON

LONDON HOSPITAL MEDICAL COLLEGE

The College Board have made the following awards for 1941-2: Price Scholarship in Science (value £100).—A. J. Dinn. Open University Scholarships (a) (£100).—A. Comfort, Trinity College, Cambridge; (b) (£100).—K. A. A. Wray, King's College, Cambridge, and P. F. Haggart, Downing College, Cambridge (Scholarship divided).

UNIVERSITY OF OXFORD

Diploma in Ophthalmology, 1941

The Board of the Faculty of Medicine gives notice that the two-months course of instruction at the Oxford Eye Hospital will begin on Monday, October 13. The examination will be held beginning on Monday, December 8; names must be received at the University Registry not later than 3 p.m. on Wednesday, November 19.

Medical Notes in Parliament

Duty on Patent Medicines

On May 20, Mr. KEELING asked the Chancellor of the Exchequer whether he was aware that his predecessor, when withdrawing, in response to the views of the House, his proposal to discontinue the taxation of patent medicines, promised to re-examine the question of continuing to tax them, and repeated this promise to a deputation of members, whether the re-examination took place, and with what result. Sir KINGSLEY WOOD replied that on the outbreak of war, in view of the pressure on the time of all concerned, the procedure contemplated by his predecessor was abandoned. Subsequently, however, on August 13 last he gave an undertaking to see, before the next Finance Bill, whether he could not get the parties together and try to get some reasonable solution of the matter. Mr. Keeling was aware of the recent developments in this connexion.

MR. KEELING asked if Sir Kingsley Wood was aware that the only parties consulted were the vendors. Did the Minister think it right that the Government should have violated their express promise without any word of explanation. Sir KINGSLEY WOOD said he thought that the procedure now in operation was the best one possible. They could not have a long inquiry, but the Minister of Health was in touch with all parties interested in the matter. Viscountess ASTOR asked if the advertisement of patent medicines was not one of the scandals which was dealt with in the last war. No one knew why the Government had given in on this.

Liquid Fire Extinguishers

Many chemical liquids, for which the claim is made that they extinguish incendiary bombs, have been tested by the Research and Experiments Department of the Ministry of Home Security. None has been found which can be recommended in preference to water. Mr. MABANE in stating this on May 21 added that some of the liquids being sold are corrosive; some contain caustic substances dangerous to the eyes; others produce fumes and smoke which may be harmful and make fire-fighting difficult.

N.H.I.: Income Limit to be Raised

Mr. ERNEST BROWN announced on May 22 that the Government intended to introduce very shortly legislation to increase the benefits payable under National Health Insurance, in particular, sickness, maternity, and disablement benefits. This legislation could not, in present circumstances, be more than an interim measure designed to give effect to changes in the health insurance scheme necessary to meet wartime conditions. The Government hoped it would be possible to carry through in due course a thorough overhaul of the existing schemes of social insurance, particularly health and pensions insurance and workmen's compensation. It held that the comprehensive survey of the existing schemes which must be an essential preliminary to such legislation should be set on foot at once as part of post-war planning. The survey was to be undertaken forthwith by Mr. Greenwood in association with other Ministers concerned.

The Bill which the Government intended to introduce shortly would, as from the beginning of the next benefit year in January next, increase by 3s. the statutory rates of sickness and disablement benefits payable under the Health Insurance Acts. The sickness benefit for a man would be raised from 15s. to 18s., and his disablement benefit from 7s. 6d. to 10s. 6d. For single women and widows the new rates would be 15s. and 9s. respectively, and for married women 13s. and 8s. Any cash additional benefits would continue to be payable over and above these minimum rates. These changes would be made possible by the payment of State grant on the usual basis and by increasing by 2d. the weekly contributions payable in respect of men and women alike—1d. of this increase to be borne by the employer and 1d. by the insured person. The Bill would also raise to £420, as from January next, the remuneration limit for the compulsory health and pensions insurance of non-manual workers. In addition to other health and pensions rights, this would give to rather fewer than 500,000 fresh persons a title to free medical treatment and attendance. The position thus created was being discussed with the medical profession. Power would also be sought in the Bill to deal with the position in insurance of civilian prisoners of war and other similar war problems.

Ministry of Health Report.—Mr. ERNEST BROWN announced on May 8 that he proposed to issue from the Ministry of Health a summarized report covering the two years ended March 31, 1941, when this material had been collated. Sir FRANCIS FREMANTLE asked whether this reply referred to the Annual Report of the Chief Medical Officer of the Ministry or to the Report of the Department. Mr. BROWN: I shall do my best to have at least a summary published.

Combatant German Medical Personnel.—On May 20, Mr. SORENSEN asked the Secretary of State for War whether he had evidence to show that members of the German Army Medical Corps either were trained in the use of arms or employed them during action against our own or Allied troops. Captain MARGESSON said that no instances had been brought to his notice of the use of arms by German Army medical personnel in action against British or Allied troops, but he was making further inquiries. International law permitted the training of medical personnel in the use of arms in their own defence.

Notes in Brief

The number of death certificates received during the year 1939 in which vaccinia or vaccination was mentioned or the death was attributed to vaccinia or vaccination, and the ages in each case, were as follows: *Non-civilians:* 1 at 20 years. *Civilians:* 1 at 4 months and 1 at 31 years.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

A small increase, 38, in the number of cases of scarlet fever was reported in England and Wales, but only in four counties did the total differ appreciably from that of the preceding week—namely, London, Essex, and Yorkshire (West Riding) with increases of 10, 19, and 13 respectively, and a decrease of 18 where the notifications decreased by 25 cases. The returns for Scotland showed an increase of 25 cases.

The counties of England and Wales showed only slight variation in the number of notifications of diphtheria compared with the previous week. An increase of 19 was recorded for England and Wales and 7 for Scotland.

The notifications for dysentery, 103, were 3 less than in the preceding week. Local outbreaks were reported from two London boroughs: 15 cases in Islington (an institution) and 10 in Wandsworth. In Scotland 40 fresh cases were reported during the week, compared with 63 for the five weeks.

The incidence of enteric fever has been almost halved in England and Wales, and halved in Scotland. In the former country a quarter of the total was recorded in Middlesex—13 cases. Multiple cases were reported from Lydd 6, Warwickshire 5, Chester 4, and Northumberland 3.

Measles

The trend of the incidence of measles in Scotland is in striking contrast to that of England and Wales. The notifications in the latter country numbered 11,004, a reduction of 2,879 compared with the total of the preceding week. Two only counties from which increases were reported were Cornwall, Nottinghamshire, and Sussex where the notifications were 51, 65, and 44 respectively in excess of those recorded last week. In Scotland 242 cases of measles were notified an increase of 116. Two-thirds of the total were recorded in Lanarkshire, and 115 of these were in Glasgow.

Whooping-cough

The returns for whooping-cough showed the same contrasting trend between England and Wales and Scotland. In Scotland the notifications numbered 588, an increase of 284 on the last week and 614 above the previous fortnight. The returns are dominated by those of Glasgow where 714 cases were reported during the week under review. Although the notifications of whooping-cough in England and Wales were 99 less than in the previous week, the returns for several counties showed increases. The four fairly large increases reported were confined to small areas within the county. They were Middlesex, Finchley M.B.; Warwickshire, Birmingham C.B.; Yorkshire North Riding, Middlesbrough C.B.; and Yorkshire West Riding, Aldwick-le-Street U.D.

Cerebrospinal Fever

The incidence of cerebrospinal fever showed a slight increase in England and Wales: 17 more cases were reported than in the previous week. The only variation of any size that occurred between the notifications of the past two weeks was in London, where the cases rose from 22 to 37, dispersed throughout the metropolis. Twenty-one out of the twenty-eight metropolitan boroughs had at least one case during the week. The largest number of notifications in any borough was 4, and the boroughs with this number were Bethnal Green, Stepney, and Woolwich. In Scotland, where the incidence of cerebrospinal fever had been mounting during the previous three weeks, a large decline was recorded. The notifications for the past four weeks were 54, 77, 97, and 37.

G. R. Bakus and E. P. Griffin, jun. (*Amer. J. clin. Path.* 1941, 11, 252) report a case of teratomatous chorion epithelioma of the ovary in a virgin aged 13, who was operated on for appendicitis and on whom oöphorectomy was performed. Death due to metastases in the kidneys and lungs took place six months after the operation. The case is remarkable in that the majority of cases of chorion epithelioma are associated with pregnancy.

INFECTIOUS DISEASES AND VITAL STATISTICS

No. 13

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 3.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	1941 (b)	1941 (c)	1941 (d)	1941 (e)	1940 (Corresponding week) (a)	1940 (Corresponding week) (b)	1940 (Corresponding week) (c)	1940 (Corresponding week) (d)	1940 (Corresponding week) (e)
Cerebrospinal fever ..	326	37	31	6	13	377	29	33	2	10
Deaths		4	5				5	6		
Diphtheria	931	41	220	32	34	701	31	257	42	40
Deaths	25	3	7	2		15	1	11	3	1
Dysentery	103	30	42		—	86	5	31		
Deaths			—					—		
Encephalitis lethargica, acute	4	—	1	—	—					
Deaths		—	—							
Enteric (typhoid and paratyphoid) fever	50	4	49	7	1	33	3	10	4	1
Deaths	—	—	—	—						
Erysipelas			53	5	2					
Deaths	—	—	—	—						
Infantile enteritis or diarrhoea under 2 years						—	45	12	5	
Deaths						—	—	—		
Measles	36	5	7	21	1	26	5	4	3	2
Deaths	11,004	363	242	—	11	5,259	48	42	—	181
Ophthalmia neonatorum	19	3	—	—	—	7	—	—	—	2
Deaths	33	3	10		—					
Pneumonia, influenzal*	968	45	9	12	6	104	13	27		—
Deaths (from influenza)	34	3	3	3	—	883	45	9	7	11
Pneumonia, primary			192	13	12	55	4	1	—	2
Deaths	—	—		11						
Polio-encephalitis acute	1	—	1			59	266	13		26
Deaths		—						12		
Poliomyelitis, acute	3	—	1			2	1			
Deaths		—								
Puerperal fever	—	—	21	1	—	2	—	2	1	—
Deaths		—								
Puerperal pyrexia	123	6	8		3	3	14	1	—	—
Deaths		—				1				
Relapsing fever	—	—		3		15	17	26		4
Deaths										
Scarlet fever	1,059	57	145	55	31	636	27	127	41	52
Deaths	1	—	—	—	—	1	—	—	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Whooping-cough	4,688	121	333		—	653	8	36		3
Deaths	22	2	12	2	—	1	—	—	1	1
Deaths (0-1 year)	371	33	53	36	22	344	47	77	27	35
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	5,600	853	692	211	179	4,351	736	722	206	179
Annual death rate (per 1,000) persons living)			15.1	14.2	17.4			19.4	13.8	15.7
Live births	5 160	450	932	357	211	6,572	1,252	960	346	252
Annual rate per 1,000 persons living			19.0	25.7	18.5			19.6	25.0	23.1
Still-births	225	19	47			253	30	34		
Rate per 1,000 total births (including still-born)			48					34		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Medical News

The B.B.C. announces that a broadcast on the work of the Edinburgh Medical Missionary Society will be given in the Home Service on June 1 by Mr. W. J. Stuart.

The twenty-first annual meeting of the British Association of Dermatology and Syphilology will be held at Glasgow on July 11 and 12, under the presidency of Dr. W. H. Brown. The subject for discussion will be "Avitaminosis in relation to Skin Disease," which will be opened by Prof. J. W. McNee and Dr. G. W. Bamber. Further information can be obtained from the secretary, Dr. Henry MacCormac, 23, Wimpole Street, W.1.

The Quarterly Board of Westminster Hospital received on May 22 news concerning a new branch to be opened for in-patients in one of the Home Counties. The Board having previously agreed that a building should be obtained in which ward work could be carried on out of London, the Secretary reported that a very large property, in quiet surroundings, well equipped for adaptation as a hospital for 100 to 150 patients, had been found at a moderate yearly rental. Twenty beds in this building will be reserved for treatment of in-patients with radium.

The Hanbury Medal "for high excellence in the prosecution of original research in the natural history and chemistry of drugs" has been awarded to Harold King, D.Sc., F.R.S., of the National Institute for Medical Research, who has done important work on synthetic arsenical preparations and on the chemistry of alkaloids and sterols; also on hormones and the cardiac glucosides. The adjudicators of the medal are the Presidents of the Chemical, Linnean, and Pharmaceutical Societies, and the Chairman of the British Pharmaceutical Conference.

Agreement has been reached between the Ministry of Health and the British Hospitals Association on the financial adjustment to be made when, owing to enemy action, hospitals in vulnerable areas have to reduce their complement of beds and transfer civilian sick to institutions coming within the Emergency Hospitals Scheme. The expenditure of the hospital is to be apportioned according to the beds actually kept in commission for civilian sick and for casualties, and the hospital is to credit the Ministry with the number of "lost" civilian beds. This agreement is the subject of Circular 2308 sent by the Ministry to all voluntary hospitals in the scheme, and an accompanying document (War 184) gives details, including method of assessing bed complement in certain instances and the amount of the credit, and also the allowance to be made to hospitals for loss of patients' contributions.

The Ministry of Health is arranging for children in attendance at clinics to have black-currant syrup made from a formula drawn up by the Bristol University Agricultural Station. Black currants are well known to be very rich in ascorbic acid, and this syrup is stated to contain five times the vitamin C content of orange juice.

Prof. A. V. Hill, Sc.D., M.P., one of the secretaries of the Royal Society, has been elected a foreign associate of the United States National Academy of Sciences.

The Minister of Health has approved the appointment of Dr. N. M. Goodman and Dr. V. D. Allison as deputy senior medical officers of the Ministry.

Dr. Harold George Broadbridge has been appointed Coroner for West Middlesex in succession to Mr. R. Kemp, who retired recently.

Dr. Carl Neuberg, a German biochemist, has become professor of biochemistry at the New York University College of Arts and Science. He was formerly professor in that subject in Berlin, Amsterdam, and Jerusalem.

Following the increase in marriages there has been a big rise in the Australian birth rate. Births for the three months ending September 30, 1940, totalled 32,637, more by 1,353 than in the same period in 1939. There were 14,026 marriages in the last quarter of 1939—800 more than in the last quarter of 1938. New Zealand also reports an increased birth rate. The 1940 rate is the highest recorded since 1925, and the number of births registered exceeded the previous record total of 29,291 by nearly 3,000.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be addressed to the Secretary.

TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES: EDITOR, *Aitiology Westcent, London;* SECRETARY, *Mediocra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

LETTERS, NOTES, ETC.

"Whither Welfare?"

DR. G. ARBOUR STEPHENS (Swansea) writes: May I congratulate you highly on the splendid appearance of the *B.M.J.* of May 17, produced under conditions calculated to depress the most optimistic To everyone who has helped in so good a work be praise! I am very glad that during the stress you were able to place Sir Leonard Hill's letter (May 17, p. 764), even though it has a most peculiar tail. He calls attention to a most important article by Dr. Cicely Williams (May 10, p. 719). As one who started the first "mothercraft classes" for schoolgirls, and also the first mothers and babies welfare centre in Wales, I am in a position to appreciate much of what appears in that article. The great mistake is to assume that medical science and the medical profession are synonymous. The ability of the average man in any walk of life is a low one. The average teacher, preacher, plumber, or "doctor" is very badly informed. Dr. Williams points out that great discoveries in medical science are not implemented (except by the wholesale drug houses) by the medical profession, but what does the average medical man know or care about "science"? The preliminary science examination is no test of scientific knowledge, and the assumption of infallibility by one who has just scraped through a qualifying examination precludes all possibility of preventing disease by such a person. Fifty per cent. of our hospitals would be superfluous were we to feed ourselves properly.

"Bureaucratic Surgery"

Dr. ROWLAND COCKSHUT (Hendon) writes: The ingenuity of the human mind is infinite. One would not have thought it possible to contest Mr. Lake's conclusions, but Prof. Jefferson, defending the proposal to establish centres for the treatment of head injuries, including scalp wounds, says, "Once it had been decided to open these centres, the next question was, What types of injury were to go into them?" And Dr. F. M. R. Walshe says, "We have all been very ignorant of the incidence, range, and character of the abnormal neurological signs that may accompany apparently trivial scalp wounds." I submit that there is a lack of information of the incidence, range, and character of the results which may flow from sitting on a pin. They vary from acute septicaemia to the later appearance of the pin sticking out of the great toe. And the ultimate results, especially from the point of view of psychologists, of a good crack on the funny-bone in early youth are almost completely uninvestigated. I have been struck lately by the case of a man whose libido was released and whose Oedipus complex went into a fugue by a sound smack on the funny-bone. Now that the new centres are ready, what shall we put in them?—indubitably the traumatic pin-pricks and the traumatic funny-bones. My own two children had seven very traumatic cranial wounds at odd times which I stitched in the bath-room. *Fortunati ambo!* The children of the 1960 doctor will perhaps live in an age when there will be centres for head wounds, and, what is more, some sanitary inspector will force them to go there. I dedicate this letter to the untold millions of broken heads, stitched by ignorant practitioners who never knew that "abnormal neurological signs are to be found in a considerable portion of such cases by those who, trained to elicit them, make a systematic search for them." "Out of sight," sez you, "Out of mind," sez I.

New Dried Milk for Infants

The Ministry of Food will shortly supply under the National Milk Scheme a new dried milk with a modified cream content of 16% instead of the usual 27%. It is intended for babies under 12 months old who are likely to suffer from digestive troubles if fed on full-cream dried milk. As it may not be suitable for all infants, mothers applying for it should first obtain the advice of a doctor or a welfare centre. The new product will be known as "Half-cream National Dried Milk." The full-cream powder, however, will still be available.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY MAY 31 1941

General Medical Council

Opening of Summer Session

The summer session of the General Council of Medical Education and Registration was opened on Tuesday, May 27, under the presidency of Mr. H. L. Eason, C.B., C.M.G., who gave an address. Owing to damage by enemy action to the Council's premises, the session was held in the building of the Royal Institute of British Architects in Portland Place

Dr. D. F. Cappell, representative of the University of St. Andrews, and Dr. W. J. Wilson, representative of Queen's University of Belfast, being new members, were introduced by Dr. Campbell and Mr. Lowry respectively and took their seats.

Correspondence

State Medical Service

SIR,—The omniscience of the modern schoolboy is proverbial, as Dr. Hugh Paul points out in his trenchant and witty letter (*Supplement*, May 17, p. 68), and I would add that he is also well versed in the science of lexicology. He would most certainly not mistake a generalization for a declaration or an edict, though he might be tempted to confuse it with a dogma, but this would be excusable on the grounds of youth and inexperience. My comment was not aimed at any of the antlered stags mentioned by Dr. Paul, nor even at the M.O.H. for Smethwick, or any other town or borough; it concerned the rank and file of the medical profession only.

By flinging the facile taunt of commercialism, Dr. Pybus (*Supplement*, May 10, p. 58) makes good use of that valuable legal aphorism, "When you have a bad case to defend abuse the plaintiff's attorney." But I do not accept his soft impeachment. It is, in my opinion and that of many of your correspondents, high time to review the whole question of medical finance in an atmosphere cleared of suspicion and false shame. Medicine does not benefit by being harnessed to commerce, I agree, but it suffers by being shrouded in a cloak of genteel poverty. In any scheme for the future of medicine the financial aspect is the least important, but that does not mean it is to be denied very careful consideration. My alternative scheme did not pretend to be an accomplished fact; it was intended to show that the profession must, and could be, *faber et magister suae fortunae*.—I am, etc.,

Beckenham, May 21. ALAN MARSH.

SIR,—I have read all the letters and articles about this most interesting subject in your columns, but what strikes me is that so far no one has ventured to state definitely how the introduction of such a service will affect his daily life, apart from being relieved of bad debts and having a fixed income taxed at the source. Surely it is obvious that if introduced a State Medical Service will entangle our lives to a greater extent than mere financial matters. For instance, there will be the question of the distribution of medical personnel throughout the country. Now, can any of the advocates of the service assure me that I can settle down in any part of this island I care to choose to practise my profession, or will it be my lot to be sent to whatever part the dictates of distribution compel someone in Whitehall to put me? If I am established in practice in Oxford, can I be assured that I can remain there and be free from the possibility of my being sent to, say, Wigan against my will? To me that is the essential meaning of "service" in this sense. We shall individually be like the employees of the G.P.O., in so far as we shall be liable to be uprooted from places where we have made our lives and be transferred elsewhere in the customary frigid manner which the State uses towards anyone it happens to employ.

Will the country be cut up into regions based on teaching hospitals or medical schools, and will such regions be exclusively served by medical men educated in the parent teaching hospitals? Is the service to be governed by the profession with the addition of a few lay members, or are our lives to be laid at the mercy and whims of local or national politicians? It cannot be refuted that a doctor should be in a position to act fearlessly according to his conscience like a High Court judge, instead of having to risk his post in the process. Can a State Medical Service be run on lines which can assure us enough independence to give our opinions without fear or favour?—I am, etc.,

Bristol, May 17. OLIVER SLOAN.

Increase in Private Fees

SIR,—In the report of the proceedings of Council of the British Medical Association at a meeting on April 23 (*Supplement*, May 3, p. 54), a recommendation by Dr. Bone was agreed to, "that an increase of fees has been rendered inevitable by rising costs, and that practitioners in general practice be recommended to increase their private fees, including contract fees, by not less than 20%." This has since been duly advertised in the lay press. At the present time the majority of patients in general practice are suffering loss and hardship. In a great many cases it is essential to reduce fees and not to raise them. Every effort is being made by the Government to control rising prices to prevent inflation. This advice by the Council of the Association is, in my opinion, both unpatriotic and unwise, and I note it was made on the recommendations of a few Divisions. I cannot believe that it represents the opinion of the bulk of the medical profession.—I am, etc.,

Bournemouth, May 20. E. D. GRANGER, M.D.

Capitation Fee

SIR,—A meeting of the Bristol Panel and Local Medical Committee was held on May 6 at which the capitation fee was discussed. It was noted that the profession was informed in the *Supplement* of December 21, 1940 (p. 57) that "an application is being made to the Ministry of Health for a wartime increase in the annual capitation fee for the treatment of insured persons." It was further noted that in the *Supplement* of April 26, 1941—eighteen weeks later—the Insurance Acts Committee stated that the Ministry had refused the application, and that "the general feeling of the Committee . . . was that the claim on the ground of increased cost of living should not at the moment be pursued," but it "resolved to proceed with the claim on the ground of increased practice expenses."

The Bristol Panel and Local Medical Committee feels that the refusal of the Ministry to accept the application is a serious blow to panel practitioners. It views with grave concern the fact that the Insurance Acts Committee is so out of touch with, or lacking in sympathy for, the wishes of the panel practitioner that it has decided not to pursue the claim on the ground of increased cost of living at once. It views with even graver concern the fact that the Insurance Acts Committee, after stating that it "had withheld the application until the circumstances placed beyond doubt the justification of such a course," had not the courage of its convictions to carry the application to a logical conclusion.

The committee is of opinion that the reasons for the claim are so obvious that it need not stress them, but it would point out that the war has brought for panel practitioners much extra gratuitous work, such as the treatment of insured persons wounded in air raids and the signing of innumerable

forms dealing with such things as gas masks, milk, and Service allowances. The committee believes that the present high morale and determination of the civil population depend, especially in badly raided areas, very largely on the doctors who come in intimate contact with the people. This causes great strain on their own resolution and cheerfulness, and the strain should not be increased by an anxiety over financial matters and by a knowledge of lack of consideration for their justifiable claims. Noting that the Insurance Acts Committee would put forward the application "if comparable sections of the community received an increase of remuneration," the committee regrets the absence of any information that the Insurance Acts Committee is taking the obvious course of approaching the recognized organizations of comparable sections of the community to present a united front and avoid one section being played off against another so that all fall separately in the best Continental and Balkan manner. Finding incidentally that, following representations by the British Medical Association, the Minister of Health has approved the payment of cost-of-living bonus to certain medical officers employed by local authorities (*Supplement*, January 11, 1941, p. 6) the committee points out that either these officers are of an inferior status or that a comparable section of the community is already receiving an increase of remuneration, and the claim should therefore be put forward by the Insurance Acts Committee.

With these considerations in view the Bristol Panel and Local Medical Committee unanimously resolved:

1. That the Insurance Acts Committee should be asked to call an immediate meeting of the Conference of Panel and Local Medical Committees, to decide the future action of the Insurance Acts Committee in the matter of the claim for an increased capitation fee.

2. That if a meeting of this conference in wartime is impossible, the members of the Insurance Acts Committee should ascertain the views of Panel and Local Medical Committees by personal contact and thereafter act on these views.

3. That these observations and resolutions be sent to the Insurance Acts Committee, all Panel and Local Medical Committees, and to the *British Medical Journal* for publication to inform panel practitioners in general.—We are, etc.,

R. BURGES, Chairman.
J. A. BIRRELL, Secretary.
May 14. Bristol Panel and Local Medical Committee.

Medical Services of H.M. Forces

Appointments

ROYAL NAVY

ROYAL NAVAL VOLUNTEER RESERVE

Probationary Temporary Surgeon Lieuts. M. R. W. Wynn-Williams, W. S. Larcombe, W. Weir, S. A. Bather, D. A. Tolhurst, R. E. Rainey, and W. A. Cavanagh to be Temporary Surgeon Lieutenants.

ARMY

Colonel W. L. E. Fretz, late R.A.M.C., having attained the age for retirement has retired on retired pay.

Lieut.-Colonel (temporary Colonel) J. G. Gill, D.S.O., O.B.E., M.C., from R.A.M.C., to be Colonel.

ROYAL ARMY MEDICAL CORPS

Major (temporary Lieut.-Colonel) E. S. Cuthbert to be Lieutenant-Colonel.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

The surname of Lieut.-Colonel I. R. Hudleston, D.S.O., is as now described, and not as notified in the *London Gazette* dated April 15.

Captain C. W. Sparks, M.C., and Captain (temporary Major) L. J. Shell, M.C., to be Brevet Majors under the provisions of Article 168, Royal Warrant for Pay and Promotion, 1940.

War Substantive Captain C. W. Simpson, M.C., has ceased to belong to the Reserve of Officers on account of ill-health. (Substituted for the notification in the *London Gazette* of April 15.)

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Lieut.-Colonel G. W. R. Bishop, T.D., from Somerset Light Infantry, to be Lieutenant-Colonel.

Majors E. White and L. G. Llewellyn, from R.A.M.C., Temporary Commissions, to be Majors.

Major A. R. Muir, having attained the age limit, has relinquished his commission, and retains his rank.

War Substantive Captain D. J. A. Alban-Jones has taken rank and precedence in his Corps and in the Army as if his appointment as War Substantive Captain bore date July 13, 1940.

Supernumerary for Service with Queen's University, Belfast, Contingent, Senior Division, Training Corps (Medical Unit).—J. R. Wheeler and W. A. Brown, late Surgeon Sub-Lieutenant, R.N.V.R., to be Lieutenants.

LAND FORCES: EMERGENCY COMMISSIONS

ROYAL ARMY MEDICAL CORPS

D. McAlpine to be Lieutenant, and has been promoted to the rank of acting Colonel.

F. M. Stewart to be Lieutenant, without pay and allowances, and has been ng rank of Major.

The Army Dental Corps, to be Captain.

has *relinquished* his commission.

:ains J. P. Watson and N. H. M. R. Monro have ...esions on account of ill-health.

...ding Lieut. L. L. Ratazzi in a *Supplement* to the *London Gazette* dated January 6 is cancelled.

Lieut. B. P. O'Hara has resigned his commission.

Lieut. J. E. B. Morton has relinquished his commission on account of ill-health.

To be Lieutenants: G. Haggar, G. N. Braham, O.B.E., S. G. Alavoine, J. D. Ball, F. L. Bland, H. J. S. Coldham, J. A. Harper, J. C. Hislop, K. Lumsden, H. I. Maister, C. E. S. Myers, M. P. O'Driscoll, T. A. Shannon, F. M. S. Smith, K. H. Tallerman, F. B. Thomas, R. W. Thompson, R. D. Borthwick, T. B. D'Costa, C. E. Friskney, I. Gilbert, L. S. Glass, K. K. Kcamaris, G. R. Millar, R. Mitchell, J. W. Taylor, R. M. Wink, W. G. L. Flather, F. G. Hunter, R. S. Illingworth, A. Ross, G. D. Malcom, J. MacKenzie, A. C. Price, T. E. Marshall, C. W. R. Price, J. J. L. Ablett, E. A. Clegg, C. C. Corfield, S. Durham, M. Latner, J. Markowitz, L. C. Oliver, P. R. Saville, C. M. Seaward, P. Tettmar, J. B. Tolmie, W. N. Vellacott, R. W. Black, R. Good, D. Purdie, D. Valerio, A. S. Baker, W. Fraser, R. A. Furniss, N. E. Maby, H. A. Taylor, R. H. Cuthbert.

Supernumerary for Service with Aberdeen University Contingent Senior Division, Training Corps (Medical Unit).—J. F ...

Supernumerary for Service with Edinburgh ... ior Division, Training Corps (Medical Unit).—D. C. ... ello to be Lieutenants, the latter without Army pay and allowances.

To be Medical Officers with the relative rank of Lieutenant: Kathleen H. McKenna, Kathleen M. Matthews, Jean S. Riach, Dora J. B. Falconer.

THE ARMY DENTAL CORPS

W. Rotheram to be Lieutenant.

ROYAL AIR FORCE

ROYAL AIR FORCE VOLUNTEER RESERVE

Flight Lieut. D. McGregor has resigned his commission.

To be Flight Lieutenants for the duration of hostilities: J. B. Mutch, B. C. Nicholson, P. J. Nyhan and H. G. Roberts.

Flying Officers W. A. Bridgwood, B. Burns, K. R. Hudson, J. S. A. Linton, E. R. Brown, R. S Castle, G. T. B. Mackinnell Childs, A. J. B. Phillips, G. Pollock, P. Wilson, F. R. Buckler, J. W. Garraway, A. P. Gorrie, A. I. McKendrick, E. E. Phillipp, J. F. J. Hickey, E. W. Melvin, W. B. James, D. D. Morrell, L. M. Rouillard, G. C. W. James, E. B. D. Bangay, W. Anderson, J. Graham, R. Cuddeford, G. Oppenheimer, H. C. Thomas, M. S. C. Stephens, L. B. Furber, A. H. Jack, C. Joseph, C. B. I. Willey, D. S. Young, P. M. Davies, A. R. Farmer, D. R. Gray, L. M. Magurk, J. F. Houlihan, L. W. Aldridge, G. P. Barclay, and J. Watson have been promoted to the war substantive rank of Flight Lieutenant.

Miss Annie D. M. Adams has been promoted to the relative rank of Flight Lieutenant.

To be Flying Officers for the duration of hostilities: H. S. Boyce, A. R. Bradley, G. H. Campbell, K. Harrison, H. Jefferson, E. O'C. Parsons, A. Ponder, E. S. Reed, J. Simpson P. N. Stanbury, P. Steen, B. A. D. Stocker, P. V. Suckling, G. W. E. Walker, G. B. Will, P. B. Willan, J. J. Williams, H. Carr, F. J. S. Chapman, P. H. Davies, E. H. Gordon, E. L. Graff, D. S. Grant, R. G. P. Heard, T. Hepburn, E. I. Holloway, E. K. Jones, D. R. Levinson, J. W. G. McDougall, D. A. Osborne, J. M. Russell, W. Sinclair, H. J. M. Stratton, R. D. Tonkin, M. W. L. White.

The notification concerning P. E. Percival in the *London Gazette* dated April 11, 1941, should read Perceval.

Postgraduate News

The ... announces the following courses for Final F.R.C.S ... demonstrations 2 p.m., Wednesdays, July 2 to 23; ... y, 10 a.m. to 1 p.m., July 7 to August 1; (3) Pr... ... course, Mondays, Thursdays, and Fridays, 2 p.m. to 4 p.m., July 7 to August 1; (4) Urology course, Thursdays, 2.30 p.m., August 7 to 28.

WEEKLY POSTGRADUATE DIARY

BRITISH ... W.—Daily, 10 a.m. to 4 p.m. ... s, Obstetrical and Gynaecc ... p.m., Post-mortem demonst ... r. R. Lightwood. Wed., ... edical). Thurs., 2 p.m., ... idiological Demonstration ... -pathological Conference ... (Gynaecological); 3 p.m., ...

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W. *Brompton Hospital*, S.W.—Mon. and Thurs., 5 p.m., M.R.C.P. Course in Chest Diseases. *West End Hospital for Nervous Diseases.*—Tues. and Fri., 3.30 p.m., M.R.C.P. Course in Neurology. *Royal Chest Hospital*, City Road, E.C.—Wed., 3.30 p.m., M.R.C.P. Course in Heart Diseases.

EDINBURGH POSTGRADUATE LECTURES.—At Edinburgh Royal Infirmary, *Thurs.*, 4.30 p.m. Lieut.-Colonel W. F. Harvey, Simplification of Blood Examination.

DIARY OF SOCIETIES AND LECTURES

BIOCHEMICAL SOCIETY.—At National Institute for Medical Research, Hampstead, N.W., Sat., 2.30 p.m. Communications.

DAVYHULME MILITARY HOSPITAL MEDICAL SOCIETY.—Thurs., 3 p.m., Major C. E. Sykes, R.A.M.C.: Recent Advances in Anaesthetics. Medical men and women in any of the Services, including civilian, will be welcomed.

VACANCIES

EXAMINING FACTORY SURGEONS.—The following vacant appointments are announced: Ludgershall (Wiltshire); Royston (Hertfordshire). Applications to the Chief Inspector of Factories, Home Office, Queen Anne's Chambers, 28, Broadway, S.W.1, by June 10.

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

BIRTH

McGINN.—On May 17, 1941, at Much Birch, Hereford, to Ella (*née* Herdman), wife of Dr. Maurice B. McGinn, a son.

DEATH

ACHESON.—On May 13, 1941, at Torquay, Johnston Hamilton Acheson, Fleet Surgeon, Royal Navy (retired).

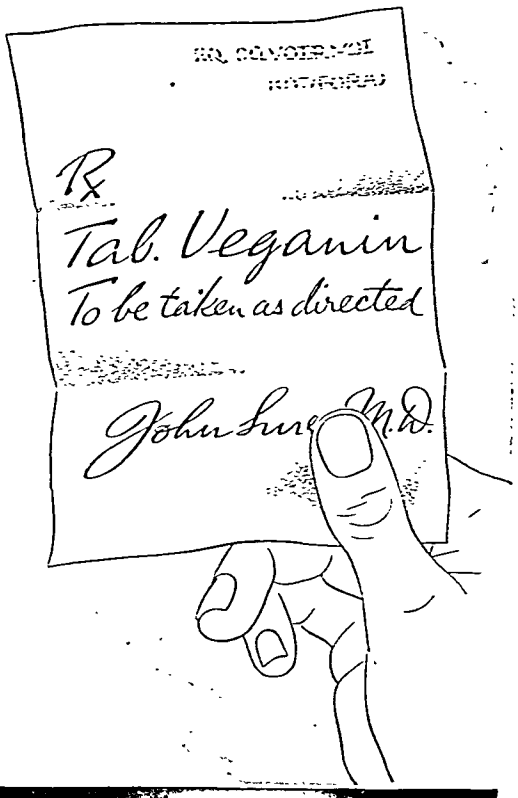
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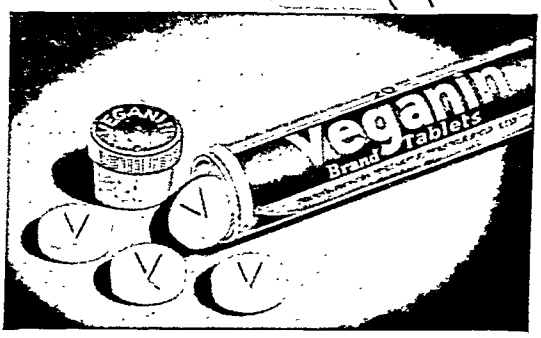
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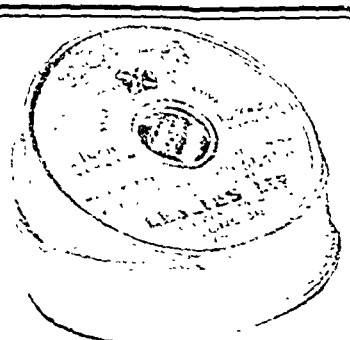
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BRITISH MEDICAL JOURNAL

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THE CALCULATION AND PRESCRIBING OF INFANTS' FEEDS

I. AFTER THE NEONATAL PERIOD: THE USE OF STANDARD MIXTURES

BY

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Physician to the Queen's Hospital for Children, Member of the Staff of the Medical Research Council

The evacuation of babies from cities results in infants of all sorts of feeds arriving in country towns and villages or outlying hospitals, and among the many causes of the drift back to evacuation areas of mothers and babies is difficulty in obtaining help with problems in infant feeding. When so many doctors and nurses whose previous experience has been in other fields of medicine are being called upon to deal with infants in overcrowded clinics, it is hoped that a paper such as this may be of service to some practitioners who have to give instruction in a subject with which they are not thoroughly familiar.

Far the commonest of the gross errors in infant feeding are quantitative; these often arise from difficulties in calculating the calorie value of individual feeds, from failure to estimate the whole twenty-four-hour intake, and from errors in measuring. The object of this paper is to suggest how some of the common problems in infant feeding may be met, and labour minimized, by making up all infant feeds in dilutions to provide 20 calories per fluid ounce—the calorie value of breast milk. Breast-feeding is, of course, to be preferred to artificial feeding, but the management of breast-feeding is not here considered.

Instruction of Nurses in Calorie Requirements

It is necessary for all nurses concerned with infant feeding to know something of calorie values and of how to calculate a baby's approximate quantitative needs, and this they will quickly learn to do if put on the right track. It is helpful to provide nurses with some tabulated information, to be hung up in the ward kitchen, day nursery, or infant consultation room, as the case may be. Tables are here given with this end in view; they can be considerably shortened by those doctors proposing to use only a few foodstuffs for infants.

Table I shows the calorie value in round figures of some of the foodstuffs commonly used for infants in this country. The figures are approximate only, as shown by the following examples: (*a*) The average calorie value per ounce of human milk or cows' milk is probably nearer 19 than 20, but to simplify calculations 20 is generally used for practical work. (*b*) The solids in dairy milk amount to approximately 12½%, and to reconstitute milk on this basis 56 grains of milk powder are required with enough water to make 1 fl. oz. of mixture. However, in this table round figures are again inserted, and 60 grains or 1 drachm (troy) of milk powder is given the calorie value of 20. (If, in fact, 19 is the average calorie value of 1 fl. oz. of dairy milk or of 56 grains of powder, then the calorie value of 60 grains of powder would be 20.4. Thus on this basis the approximate figure 20 given in the table is correct to the nearest whole number.) (*c*) The average caloric value of 1 fl. oz. of sweetened condensed milk is very variable, but is over 100 calories; however, for practical purposes the round figure of 100 is near enough. (*d*) One must remember that domestic measures used for the measurement of feeds are subject also to a considerable margin of error. The use of domestic measures is further considered in a later section.

TABLE I.—*Calorie Values (approximate) of Foodstuffs for Infants*

Foodstuff	Calorie Value
Human milk	20 calories per fl. oz.,[1] 400 calories per pint
Cows' milk	20 ,, ,, ,, [1] 400 ,, ,,
Dried milk	
Full-cream milk	20 calories per drachm (troy) or per level measure[2]
Half-cream milk unsweetened	16 ,, ,, ,, ,, [2]
Half-cream milk, sweetened	16 ,, ,, ,, [2]
Skimmed milk	13 ,, ,, ,, [2]
Protein milk	Usually about the same as full-cream dried milk
"Humanized" milk	,, ,, ,, ,, ,, ,,
Condensed milk	
Sweetened	100 calories (or more) per fl. oz.—say, 20 calories approximately per level teaspoonful[3]
Unsweetened	60 calories (very variable) per fl. oz.—say, 12 calories approximately per level teaspoonful[3]
Dried whey	12 calories per drachm (troy) (very variable)
Sugar	15 calories per drachm (troy)
Castor or granulated	15 calories per level teaspoonful[3]
Fats and oils	35 calories per drachm (troy) 50 calories approximately per level teaspoonful[3]
Cereals	12 calories per drachm (troy)
Benger's	60 calories per drachm (troy) 50 calories approximately per level dessertspoonful[4]

[1] For measuring fluid milk or water when no proper graduated measure is available, use the baby's bottle. Do not use tablespoons.
[2] For measuring dried milk the measure supplied for that particular milk powder by the makers should always be used.
[3] For measuring condensed milk (when no graduated measure is available) or for measuring castor and granulated sugar, use a large domestic teaspoon holding just over 1½ drachms (1.6 fl. dr.) by volume.
[4] For measuring Benger's food, use a dessertspoon, holding 1·2 fl. oz. by volume.

Table II gives some simple instructions to nurses for calculating calorie requirements. In essentials it amounts to starting a baby newly under observation on the calorie equivalent of 1½ to 2 oz. of breast milk per pound of body weight per day, and increasing to 2½ oz. or more according to the baby's appetite and progress. Scales of approximate calorie requirements are essential in infant feeding, but naturally any scale must be used with due regard to the individual baby. For the normal baby, appetite and rate of gain in weight form very good criteria of whether or not he is receiving about the right quantity of food, and mothers should be instructed not to press infants to take more than they want. No directions are given in the table concerning the quantitative requirements of the newborn, as this is a subject which cannot profitably be dealt with in a few sentences; it is considered in Part II of this paper.

TABLE II.—*Calorie Requirements per Pound Body Weight in 24 Hours*

Babies of normal weight:
1 week to 5 months old: 50 calories (2½ oz. breast milk or "standard mixture") per lb. body weight.
5 months to 7 months old: about 50 calories, decreasing to, say, 45 calories per lb. body weight.
Thin babies and premature babies:
These require more—say, 55 to 65 calories (2¾ to 3¼ oz. breast milk) per lb. body weight, if they can digest it. Premature babies may temporarily need still more, but should always be started on small feeds.
Fat babies:
These require rather less per lb. body weight than babies of normal weight.
Newborn babies:
The figures given above do not apply to newborn babies, whose food intake in the first days of life is small and increases gradually.
Example of calculation of feed:
A baby weighing 10 lb. is to be given 50 calories per lb. body weight in 24 hours, or 10×50—i.e., 500—calories in the day. If this is made up in the strength of 20 calories per fl. oz. he will require 500÷20—i.e., 25—oz. per day, or five feeds of 5 oz. each, or six feeds of about 4 oz. each.
It is usually wise to start a baby newly under observation on perhaps two-thirds of his full requirement, and work up to the full amount gradually by the end of two or three days if he is taking satisfactorily: sudden large increases in the calorie intake are always risky.
Normal rate of gain:
Babies making satisfactory progress should gain as follows: Under 5 months old, about 6 oz. weekly; 5 to 12 months old, about 4 oz. weekly.

Advantage of Standardizing the Calorie Concentration of Feeds at 20 Calories per Fluid Ounce

If large numbers of babies have to be dealt with the difficulties of supervising feeds are for most of us insuperable without some standardization. By consistently using standard mixtures or solutions, each providing, like breast milk, approximately 20 calories to the fluid ounce, the whole problem can be enormously simplified and labour reduced.

Table III shows the quantities of various foodstuffs, with water, required to provide approximately 20 calories per

TABLE III.—*Standard Mixtures and Solutions containing approximately 20 Calories per Fluid Ounce*

Dried milk, full-cream[1,3]	1 dr. (troy) or 1 level measure
With water to	1 fl. oz. (measured with graduated measure or feeding bottle)
Dried full-cream lactic acid milk[1]	Ditto
Dried protein milk[1]	Ditto
Dried humanized milk[1]	Ditto
Dried milk, half-cream[1]	1½ dr. (troy) or 1½ level measures
With water to	1 fl. oz. (as above)
Condensed milk, sweetened[2,4]	1 fl. oz. or 1 level teaspoonful
With water to	5 fl. oz. or 1 fl. oz.
Condensed milk, unsweetened[2]	1 fl. oz. or 1½ level teaspoonfuls
With water to	3 fl. oz. or 1 fl. oz.
Sugar, cane[2]	1½ level teaspoonfuls
With water to	1 fl. oz.
Sugar, lactose[2]	2 level teaspoonfuls
With water to	1 fl. oz.
Cows' milk	10 fl. oz.
Sugar (cane)[2]	8 level teaspoonfuls
33% fat emulsion	1 fl. oz.
With water to	20 fl. oz.

[1] Roller-process-dried milk should be freshly mixed for each feed. Ladle the milk into the makers' measure and level it off without compressing it. Never measure it with a teaspoon. Half-cream unsweetened dried milk and the so-called half-cream milk powder to which lactose has been added by the makers are of about the same calorie value, and 1½ level measures in a fl. oz. provides about 20 calories per fl. oz.
[2] The teaspoon used for measuring sugar should hold just over 1½ fl. dr.—the same-sized spoon will serve for condensed milk if no suitable graduated measure is available.
[3] A 1-lb. packet of full-cream milk powder per week provides daily about 17 measures, or 17 fl. oz. of reconstituted milk. A 20-oz. (avoir.) tin of milk powder per week provides daily about 20 measures, or 20 fl. oz. of reconstituted milk.
[4] A tin of sweetened condensed milk holding approximately 1/2 pint provides about 2½ pints of standard 1-in-5 mixture.

fluid ounce—the so-called "standard" mixtures of this paper. When feeds have to be made up for a number of babies in a ward they can conveniently be ordered as "standard" mixtures or solutions (see Table IV, last column). Sugar solutions can be mixed once daily and measured out as required for each feed in the day. Dried milk or condensed milk can be mixed at feeding times in one bowl for several babies, and from the "standard" mixture so prepared the necessary volume measured for each infant. On the other hand, if directions are given to the mother the use of the term "standard" mixture is merely confusing to her: she should be told to make up each feed as it is required by her baby, and to give such and such an amount of each constituent, with water to the required number of ounces (as shown in Table IV, third column).

If all the feeds ordered provide 20 calories per fluid ounce the calorie intake for the day is easily estimated, and if the feed is altered from full-cream dried milk to half-cream dried milk or sweetened condensed milk no intricate arithmetic is involved, as this simply means the exchange of one "standard" mixture for another, ounce for ounce (see Table IV). Without some such basis a

TABLE IV.—*Examples of Feeds containing approximately 20 Calories per Fluid Ounce*

Volume of Feed	Foodstuff	Quantity	As Standard Mixtures or Solution
			fl. oz.
2 fl. oz.	Full-cream dried milk	1 level measure	1
	Sugar	1½ level teaspoonfuls	1
	Water to	2 fl. oz.	
	Full-cream dried milk	1½ level measures	1½
	Sugar	1 level teaspoonful	½
	Water to	2 fl. oz.	
	Half-cream dried milk	1½ level measures	1
	Sugar	1½ level teaspoonfuls	1
	Water to	2 fl. oz.	
	Half-cream dried milk, sweetened	2½ level measures	2
	Water to	2 fl. oz.	
	Dairy milk	1 fl. oz.	1
	Sugar	1½ level teaspoonfuls	1
	Water to	2 fl. oz.	
	Sweetened condensed milk	2 level teaspoonfuls	2
	Water to	2 fl. oz.	
3 fl. oz.	Full-cream dried milk	2 level measures	2
	Sugar	1½ level teaspoonfuls	1
	Water to	3 fl. oz.	
	Dairy milk	2 fl. oz.	2
	Sugar	1½ level teaspoonfuls	1
	Water to	3 fl. oz.	
5 fl. oz.	Full-cream dried milk	4 level measures	4
	Sugar	1½ level teaspoonfuls	1
	Water to	5 fl. oz.	

baby's feed may be unintentionally doubled or halved in calorie value, with the ill results one would expect. Other reasons, besides simplicity, for giving food of the same calorie concentration as breast milk are that a concentrated feed may lead to overfeeding as a result of thirst, and a dilute feed may be vomited on account of its large bulk. Again, a small or feeble baby offered a dilute feed is likely to weary and to take less than he needs. It is often supposed that by diluting with water so as to provide, say, 10 calories instead of 20 calories to one fluid ounce the feed is made more easily tolerated, but this view is not supported by experience; in fact, a baby inclined to vomit is more likely to keep down the more concentrated feed if both provide the same total calorie value. When nurses have charge of a number of babies on bottle feeds a considerable reduction in labour results from standardizing feeds. Occasionally a dilute feed or a concentrated feed is indicated for some special purpose—for example, concentrated feeds are useful for some babies who vomit from habit, but this does not detract from the usefulness of "standard" mixtures for general use.

Measurement of Feeds

Errors in measuring are a constant source of difficulty. For example, fluids (dairy milk or water) are often ordered and measured in tablespoonfuls, each tablespoon being reckoned as half a fluid ounce, whereas most tablespoons actually hold three-quarters to one fluid ounce, so that this may introduce a 100% error. A dessertspoonful is nearer half an ounce than is a tablespoonful, and many London mothers call a dessertspoon a tablespoon. Naturally, proper graduated measures should be used when available.

Even the poorest mother usually possesses a feeding-bottle graduated in ounces, which, if not an accurate measure, is at least much better than a tablespoon. The method of measuring water requires to be explained to a mother. She should be told to mix the feed (dried milk and sugar, or condensed milk) with a small quantity of water, to pour it into the bottle, and add water to the required mark.

Dried milk and sugar are habitually ordered by weight (in drachms troy) and measured by volume. Since the bulk of the same weight of different milk powders varies widely, the amount of each particular milk powder should be gauged by the measure provided by the makers. The powder should be poured into the measure with a spoon and levelled off without compression. The common practice of dipping the measure into the packet and flattening it off against the side results in considerable compression, and hence in overfeeding. Heaped teaspoonfuls are hopelessly inaccurate measures for milk powder. When all care is taken there is still a large personal error; hence in hospital it is desirable that from time to time nurses should check their measurements by actual weighing of measured quantities. Mothers who have no suitable scales can check their measurement by noting how long a packet of known weight lasts. A 1-lb. packet of full-cream dried milk provides in round figures 6 pints of reconstituted milk (more exactly, 5.82 pints containing 60 grains in each fluid ounce); thus one packet a week provides about 17 fl. oz. (more exactly, 16.6 fl. oz.) of milk daily. A 20-oz. (avoir.) tin of national dried milk provides about 7 pints of reconstituted milk (or more exactly, on the same basis as above, 7.29 pints, and a tin a week 20.8 fl. oz. daily). Thus a daily intake of 20 measures of powder—i.e., 20 oz. of reconstituted milk—is equivalent to a weekly intake of about 1¼ packets of the ordinary 1-lb. size, or one tin of national dried milk size. A daily intake of 25 measures is equivalent to a weekly intake of about 1½ packets of the smaller size, or about 1¼ tins of the larger size, and so on. If a baby is not progressing normally on a theoretically adequate feed the quantity of dried milk used in a week should always be checked.

For sugar no measure is usually provided. A large teaspoon may be used. For granulated or castor sugar the teaspoon should hold just over 1¼ fl. dr., and a teaspoon of this size should be shown to the mother or, better still, her own spoon be checked. One level teaspoonful of sugar will then be approximately 1 drachm (troy). Lactose varies in weight of a given bulk, but usually a teaspoonful (using the same large teaspoon) is considerably less than 1 drachm.

Condensed milk should, when possible, be measured with a graduated measure. A feeding-bottle is not a satisfactory measure for condensed milk on account of the relatively small volume to be measured. Both sweetened and unsweetened condensed varieties vary widely in calorie value. If the sweetened is reckoned as 100 calories per fluid ounce (an under-estimate in most cases), then 1 in 5 by volume provides a mixture with 20 calories to each fluid ounce. Hence for each fluid ounce of mixture 1.6 fl. dr. of this milk is required—i.e., say one large teaspoonful (level) with water to one fluid ounce. A teaspoonful in an ounce is often called a 1 in 8 dilution, forgetting that a teaspoonful and a drachm are far from synonymous. If the unsweetened condensed milk is reckoned as 60 calories per fluid ounce, then 1 in 3 by volume, or, say, 1⅔ large teaspoonfuls (level) in 1 fl. oz., provides nearly 20 calories per fluid ounce. The calorie value supplied in condensed milk feeds is apt to be somewhat uncertain on account of the various sources of error, but nevertheless condensed milk feeds are very valuable for premature and feeble infants as well as for newborn babies for whom breast milk is not available. Sweetened condensed milk supplied in a tin holding about half a pint and diluted 1 in 5 provides about 2½ pints of "standard" mixture with 20 calories to each ounce, and calculation of the amount required in a week is an important check on teaspoon measures.

Type of Feeding

The use of "standard" mixtures as here advocated does not tie one down to any one type of feeding: dairy milk, dried milks, or condensed milks can be used with the desired proportions of sugar or with added fat emulsion and sugar (see Tables III and IV). Under the Government scheme for the supply of milk at a cheap rate for infants, at present milk in only two forms is available—i.e., either dairy milk at 2d. per pint or national dried milk (full-cream roller-process-dried milk) at 2d. per reconstituted pint—or free for those parents under a certain income level. It seems likely that the majority of bottle-fed babies in the country will before long be fed on fluid milk or on this powder, more especially as difficulty is already being experienced by mothers in obtaining proprietary processed milks. In common with the majority of paediatricians and infant welfare medical officers in this country I prefer dried milk to dairy milk for routine use for babies in working-class homes on account of its greater safety. Full-cream dried milk carefully used, with varying additions of sugar, will be tolerated satisfactorily by most babies *of normal digestive capacity*, at least after the first few weeks of life. But for babies of poor digestive capacity other processed milks are required if lives are not to be lost unnecessarily. Sweetened condensed milk is needed for premature or feeble infants, for babies in the neonatal period, and for other babies who readily vomit. So-called half-cream dried milk to which lactose has been added in liberal amount by the manufacturers is much used for young and feeble infants, and should usually be given without added sugar, since it already contains a liberal amount. Half-cream dried milk to which no sugar has been added by the makers and dried protein milk are desirable for the treatment of many cases of diarrhoea. Whether or not these will be available in the coming months seems uncertain.*

Vitamin D and iron are supplements which should be provided for all babies. The cheapest and most efficient method of giving these as a routine to artificially fed babies would be by using on a large scale dried milk in which both have been incorporated in adequate amount. But since an iron-fortified milk powder is not quite as easily tolerated as the same milk without added iron, it is wise to begin its administration gradually, as described below. So used, there is no difficulty in getting any baby who is not already upset or suffering from diarrhoea to tolerate it. Unfortunately dried milks fortified with vitamin D and iron are not available under the National Milk Scheme, and proprietary milks (many of which are so fortified) cost 80% to 24% more.

My usual routine when using dried milk, either full-cream or unsweetened half-cream, is to give in each feed approximately 20 calories in added sugar (i.e., 1 oz. of "standard" sugar solution, or 1½ level teaspoonfuls of cane sugar in 1 oz. of water) and the rest of the feed in "standard" dried-milk mixture. Thus if a baby has a 2½-oz. feed he will have 1½ fl. oz. of dried-milk mixture (half- or full-cream) and 1 oz. of sugar solution, or if he has a 7-oz. feed he will get 6 oz. of dried-milk mixture (full-cream) and still 1 oz. of sugar solution. Babies on small feeds thus get a much larger proportion of the feed in added sugar, the most easily digested part of the diet. More than half the total calories, however, should not be given in added sugar; hence in feeds of under 2 fl. oz. the

* Since this article was written the Ministry of Food have undertaken to issue a national half-cream dried milk (unsweetened) for infants.

amount of " standard " sugar solution will necessarily be less than 1 oz. For many tiny and feeble babies a high sugar feed, temporarily, is desirable, though it must be remembered that babies with loose stools often tolerate a high proportion of sugar badly. If a diet in which only half the calories are supplied as milk is long continued the risk of deficiency disease developing is considerable; therefore as soon as possible the proportion of milk in the feed should be increased and vitamins and iron supplements should be added. If more than 50% of the total calorie intake is given as added carbohydrate there is serious risk of carbohydrate dyspepsia, and loss of weight may be rapid, with irritating frothy fluid stools. As regards choice of sugar, lactose is more expensive than cane sugar and probably has no advantage over it. Sweetened condensed milk provides a feed in which about 40% of the total calories are in added cane sugar, and the commonly used sweetened half-cream dried milk a feed in which, say, 27% of the calories are in added lactose.

Supplementary Feeds

Mothers arriving in reception areas with their babies are likely to be tired, and many will have had a harassing time; as a result their lactation will often prove temporarily insufficient, and if the baby is hungry and cries much of the night his mother's milk will quickly fail, and he and his mother will not be welcome additions to any household. In such cases there should be no hesitation in supplementing one or more feeds each day. If the situation is explained to the mother and her co-operation sought it should often be possible gradually to diminish and cut out the artificial feeding when the mother has been able to settle down in new quarters. By finding those feeds following which the baby cries one can gain a fair idea which feeds it is necessary to supplement, and a co-operative and sensible mother should always be given latitude in adjusting the quantity to the baby's needs. When it is not possible to carry out many test feeds the baby's appetite, together with his rate of gain in weight, usually provides a good indication of the amount of bottle-feeding required.

Symptoms of Underfeeding and of Overfeeding

Underfeeding, however, very often goes unrecognized for many weeks. This is attributable to two main causes: (*a*) many are not familiar with the symptoms, and (*b*) the baby's estimated calorie intake is not compared with his calculated needs. The underfed vigorous full-term baby 4 weeks old and upwards will probably take his feeds eagerly, cry when the feed is finished, and cry before the next one is due—and of course either gain weight at a slow rate or lose in weight. If breast-fed he will suck for a few minutes and then turn away crying, so that the mother often concludes that he refuses to suck because he is in pain and that " her milk disagrees "; sometimes she volunteers that he has pain on micturition because he passes urine about the same time. The feeble or very young baby who is underfed, however, often shows no evidence of hunger, but becomes progressively more lethargic. The stools of the underfed baby may be infrequent or may be excessive in number, and typically are small and greenish brown, with excess of mucus, and sometimes looser than normal, though the quantity passed in twenty-four hours is always small; this distinguishes underfeeding stools from diarrhoea stools. Underfed babies are often brought to the doctor with a complaint of " diarrhoea "—and when in doubt one may have to treat the case as diarrhoea, with a preliminary starve, followed by a steady increase in food, on account of the risk involved in feeding a child who has enteritis. Occasionally vomiting is a symptom of underfeeding: the baby screams, and vomits apparently as a result; but, naturally, caution is necessary in attributing vomiting to underfeeding. Sometimes underfeeding results from inability to get the milk through the teat either because the hole is too small or because the teat is blocked by a badly mixed and lumpy feed, and in such cases one must beware of a history that the baby refuses his bottle.

If overfed the vigorous baby 4 weeks old and upwards usually gets rid of some of the food he does not require by vomiting after feeds, and shows no other symptoms. If, however, he is upset by the overfeeding (a much more frequent event in the bottle-fed than in the breast-fed, and in very young babies than in older ones) he will probably show evidence of discomfort, perhaps have a distended abdomen, and, besides vomiting, he will probably pass an excessive number of rather loose stools, the quantity in the twenty-four hours being also greater than normal. If upset the baby's normal increase in weight will be disturbed, sometimes seriously.

In practice it is common to find that a baby suffering from underfeeding has been diagnosed as overfed; when in doubt, estimation of the food intake is usually the quickest way of reaching the true diagnosis. If there are no facilities for carrying out test feeds the expression and measurement of the whole of one feed may indicate the diagnosis for a breast-fed baby.

Vitamin and Mineral Supplements.—The administration of a supplementary ration of vitamin D, vitamin C, and iron is advised for all babies—breast-fed and bottle-fed. At the present time with shortages of citrus fruits and fish-liver oils instruction is required as to possible substitutes. It seems that in Germany the Government is supplying vitamin D and ascorbic acid for all infants.

Alterations in Feeds

Upsets are often caused by sudden increases in the calorie intake, by sudden changes in the character of the feeds, or by sudden administration of a full dose of iron or even sometimes of cod-liver oil. Nurses and mothers should always be warned to increase food gradually; the average full-term baby, if hungry, can have an increase of, say, 1/2 oz. per feed at a time, and seldom more than 1 oz. increase per feed in a day. Changes from dairy milk or from dried milk containing iron to dried milk without iron; from full-cream to half-cream dried milk, or from any of these to sweetened condensed milk, can safely be made suddenly (provided there is no sudden change in the calorie value or volume of the feed), because ease of digestion increases in this order. Changes in the opposite direction require to be made gradually—e.g., directions to a mother for a change from a sweetened condensed milk feed to a feed of full-cream dried milk might be given as follows, four days being taken over the changes:

Days:	1st	2nd	3rd	4th		
Sweetened condensed milk	4	3	2	1	0 level teaspoonfuls	Four-hourly: 5 feeds in 24 hours
Full-cream dried milk	0	1	1½	2	3 " measures	
Sugar " "	0	0	½	1½	1½ " teaspoonfuls	
Water to " "	4	4	4	4	4 oz.	

For in-patient work the change over can be made by substituting, half to one ounce at a time, "standard" full-cream dried milk and sugar solution, for "standard" sweetened condensed milk mixture, again taking four days over the change as follows:

Days:	1st	2nd	3rd	4th		
Sweetened condensed milk, "standard"	4	3	2	1	0 fl. oz.	Four-hourly: 5 feeds in 24 hours
Full-cream dried milk, "standard"	0	1	1½	2	3 " "	
Sugar solution, "standard"	0	0	½	1	1 " "	

from aortitis in *acquired* syphilis. Further, the age incidence of thoracic aneurysm should be discussed.

Aortitis in Congenital Syphilis

Turnbull (1911) recorded two cases of syphilitic mesaortitis, the first in a girl aged 17 whose father suffered from a similar condition, and the second in a girl aged 7. At necropsy in both cases the macroscopic and microscopical descriptions were characteristic of syphilitic mesaortitis. There was no dilatation of the aorta. Clinically these patients did not show any of the stigmata of congenital syphilis, and the writer was not able to conclude that the lesions were of congenital origin. Heiman (1919) saw an aneurysm of the thoracic aorta in a boy aged 13 whose Wassermann reaction was strongly positive. This patient also had splenomegaly, and there was a suspicion of a gumma of the liver and Hutchinson's teeth. The mother had had two miscarriages and gave a positive Wassermann reaction. Stolkind (1920) after a careful survey of the literature could not find a single case of proved hereditary syphilitic aortitis in older children, and especially in adolescents and adults. Referring to a child aged 4 described by Willson (1914) as having an aneurysm, he stated that no process typical of syphilitic aortitis was found and that all the signs were inconclusive. Previtali and others (1930) in a series of 50 congenital syphilitics were unable to detect any evidence of aortic dilatation by clinical or radiological examinations. Givan (1930) failed to demonstrate syphilitic heart disease in 417 similar cases, whilst McCulloch (1930) concluded that congenital syphilis plays no part in cardiovascular disease in children up to the age of 15. McDonald (1932) described findings at necropsy in a boy aged 9 with congenital syphilitic mesaortitis whose father and mother were also syphilitics. The patient had interstitial keratitis and gave a positive Wassermann reaction. The aorta was examined microscopically, but no spirochaetes could be demonstrated. This writer concluded that definite clinical recognition of the condition is possible only in a few cases. Recently at the London Hospital 13 patients with congenital syphilis, whose ages ranged from 13 to 47, were examined clinically and by cardioscopy, and in none of them was there any evidence of aortitis.

It appears, therefore, that congenital mesaortitis can exist as a pathological lesion, but only rarely does it produce clinical or radiological evidence of an aneurysm.

The three cases described here do not belong to this group. In Cases I and II a history of primary infection was obtained; in the third case no stigmata of congenital syphilis were found, and the Wassermann reactions in both mother and sister were negative.

Onset of Aortitis in Acquired Syphilis

Sandford (1931) stated that in a series of 71 cases of thoracic aneurysm the average time interval between the initial lesion and the onset of symptoms was slightly over fifteen years. He found the shortest period between the primary sore and the earliest symptoms suggesting aneurysm to be two years and the longest fifty years. Coombs (1932) reviewed the literature and concluded that all observers were agreed that this interval was from fifteen to twenty-five years. Boyd (1924) studied 200 cases and gave this period as twenty years. Among 346 cases of cardiovascular syphilis Maynard and others (1935) found 190 in which the date of the primary lesion was known. About a quarter of these showed some evidence of cardiovascular disease within ten years, but the average for the series was twenty years. Evans (personal communication, 1935) examined 55 consecutive patients with acquired syphilis in whom the primary infection was known to be longer than five years. Examination was made clinically, electrocardiographically, and by cardioscopy. Aortic measurements were taken. Alteration in the aortic outline consequent on age or hypertension was considered when assessing the changes resulting from aortitis. In this series the aorta was judged to be normal in 25 patients and abnormal in 30. In 10 of the abnormals the aorta was altered as a result of hypertension or atheroma, and in 20 syphilis had produced the deformity. In relation to the primary infection aortitis was found in these 20 cases at intervals of 5 to 10 years in 1, 11 to 15 years in 4, 16 to 20 years in 5, 21 to 25 years in 4, 31 to 35 years in 4, 36 to 40 years in 1, and over 41 years in 1 case.

In the first two cases reported in this paper the interval between the primary lesion and the onset of symptoms was approximately 7½ years. In the third case the initial infection may have been acquired soon after puberty, and there is the possibility that the infection was extragenital and perhaps occurred in infancy.

It is clear that the usual latent period between the primary infection and the onset of cardiovascular symptoms in acquired syphilis is from fifteen to twenty years, but in a few cases the interval is less than ten years.

Age Incidence of Aneurysm

Many cases similar to those here described have been reported from time to time. As early as 1725 Morgagni (Kampmeier, 1938-9) did a post-mortem examination on a young woman aged 28. A small aneurysm was found half an inch above the aortic valve, which had ruptured into the pericardium. So exact is this first description of the morbid anatomical features of syphilitic aortitis that it merits recapitulation: ". . . that is to say, in some places whitish marks of a future ossification occurred; in others some small foramina, as it were, had begun to be formed; and in still other places were paralleled furrows drawn longitudinally—in this manner was the surface of the artery unequal here and there." In 1847 Crisp collected 12 cases under the age of 30. Le Boutillier (1903) reviewed the subject and discovered 18 cases under the age of 20 the aetiology of which was obscure. Richey (1923) after a detailed search of the literature found 41 cases under the age of 18, and remarked that only one of those presented definite evidence of syphilis. Brockbank (1925) analysed the records of 200 necropsies on cases of aortic aneurysm and found that 7.5% were between the ages of 21 and 31. Recently Kampmeier (1938-9) in a series of 633 cases of thoracic aneurysm found 9 (7 negro males; 1 white male; 1 negro female) under the age of 25.

Table showing Age and Sex Incidence in 840 Cases of Thoracic Aneurysm Admitted to the London Hospital 1893 to 1939

Age	Males	Females	Total
0–9	0	0	0
10–19	0	0	0
20–29	2	0	2
30–39	115	15	130
40–49	230	35	265
50–59	262	40	302
60–69	104	20	124
70–79	12	5	17
80–89	0	0	0

Authors vary as to the period of maximum age incidence of thoracic aneurysm. Lucke and Rea (1923) concluded that this period was 35 to 55, and Boyd (1924) from the investigation of 3,690 cases gave the age incidence as 36 to 40. Kampmeier (1935) stated that the highest incidence was between the ages of 45 and 55, and Cochems and Kemp (1937) in a study of 1,000 syphilitic individuals found 47 aneurysms, 39 of which occurred after the age of 50. The accompanying table compiled from the London Hospital in-patient records shows that the highest peak of incidence was

50 to 59, a somewhat higher figure than is commonly quoted. In this series it is of interest that no female patients with thoracic aneurysm were found under the age of 30.

Summary

Two cases of acquired syphilitic aneurysm in adults under the age of 30 are reported. It is probable that the disease was also acquired in the third case. Although congenital syphilitic mesaortitis does occur the incidence of aneurysmal dilatation is very rare. It is known that symptoms of thoracic aneurysm may appear within ten years of the primary syphilitic infection, but in the majority the period is fifteen to twenty years. As regards age incidence of aneurysm of the thoracic aorta, the maximum was found in the sixth decade.

My thanks are due to Dr. John Parkinson, physician to the cardiac department of the London Hospital, and to Dr. William Evans, the assistant physician, for their interest and advice; and also to the medical superintendent of Essex County Hospital, Wanstead, for his permission to publish Case III. The pathological description in Case II was kindly furnished by Prof. Hubert M. Turnbull.

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NOTE ON THE TESTING OF TRANSFUSION FLUIDS FOR CONTAMINATION

BY

W. R. LOGAN, M.D., F.R.C.P.Ed.

Bacteriologist to the Royal Infirmary, Edinburgh

It is ideal that all bottles of plasma and of citrated blood used for transfusion should have been tested for sterility, but it is also ideal that no bottles should be opened before use. These ideals are in conflict. If each bottle is to be tested it is necessary that the ritual is such as to eliminate any possibility of contamination of the material in the course of the bacteriological examination.

Technique

The technique used in this laboratory for the testing of transfusion material sent for this purpose from the Edinburgh Blood Bank is as follows.

All currents of air in the room are avoided. There is no speaking while the bottles are opened. No bottles are opened if anyone has recently sneezed or coughed near the bench. When a crate of, say, six bottles of plasma or blood is received, six tubes of ordinary or trypsin broth for aerobes and six tubes of Robertson's meat medium sealed with paraffin for anaerobes are set out in a rack and labelled. The cotton-wool plug in each tube is freed by turning, to ensure that it can later be removed with ease. The bottle is placed near to the rack and the rubber bung or screw cap removed with one hand while a Bunsen flame is played with the other on the upper rim of the bottle and air immediately above, into the upper inch or so of the aperture, and inside the screw cap or around the part of the bung which is to be inserted. The bung or cap is then replaced, but without ramming home or screwing down. A sterile Pasteur pipette is removed from the copper box in which it has been sterilized, a rubber teat affixed, and the part of the pipette which is to be introduced sterilized once more by passing through the Bunsen flame. The bung or cap is now momentarily removed and about 1 c.cm. of plasma or blood drawn into the pipette, the stopper being lightly replaced. Each culture tube in turn is then lifted between the thumb and ring and little fingers of the left hand, the cotton-wool plug is withdrawn between the index and middle fingers, the medium inoculated with half the pipetteful of fluid, and the plug replaced. In inoculating the anaerobic medium it is important that the pipette be withdrawn before all the fluid has been expelled, to avoid the introduction of air into the medium. The pipette is then discarded into a vessel containing antiseptic, and, with both hands now free, the bung or cap is again lifted and the ritual of flaming the lip and mouth of the bottle and the stopper carried through once more. Bung or cap is now screwed firmly home. All this takes only a few seconds.

The inoculation tubes are incubated at 37° C. for two days. If they remain perfectly clear the result is reported as negative. If there is any trace of turbidity, films and subcultures are made. Sometimes there is a slight change in the Robertson's medium which entails further examination when actually no organisms are present. It will be observed that while most varieties of organisms are catered for by the media used, which are enriched by the plasma or red cells introduced, there is no provision for the growth of haemophilic organisms when the material under examination is plasma. But as such organisms could not multiply in the original bottle of plasma even if accidentally introduced, it has not been thought necessary to use a blood medium.

Precautionary Measures

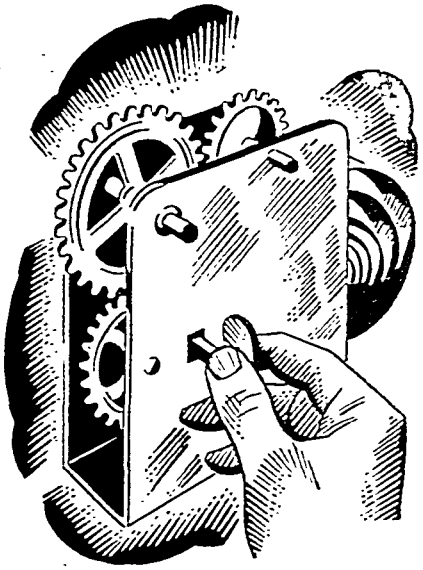
Strict injunctions are given that no one is to open a bottle except the person carrying out the examination. There is a very real danger here, as blood and plasma are both used in bacteriological laboratories for the preparation of media, and the latter for the coagulase test on staphylococci. If the Blood Bank gives an occasional present of blood to the examining laboratory it makes for additional safety in this respect. Where bottles have to be sent some distance to an outside laboratory it is advisable to seal them before sending, and before returning, in such a way as to make it obvious if they have been tampered with. Instructions are given to the messenger to shake bottles of blood as little as possible during transport.

Before being sent from the Blood Bank for testing, the bottles should be removed from the refrigerator and kept at room temperature for several days so as to give contaminations an opportunity of multiplying.

The technique above described has given satisfactory results, and can be carried through by one person. In no case, so far as can be ascertained, has it been the cause of contamination of a bottle, or failed to detect one when present.

The following notice appeared in the *New England Journal of Medicine* for February 27: "It will help England greatly in the care of victims of bombing raids and help England prepare for the coming invasion if physicians in this country all give discarded or superfluous surgical instruments or surgical dressings. Any such material should be sent to the Medical and Surgical Supply Committee, 420, Lexington Avenue, New York City."

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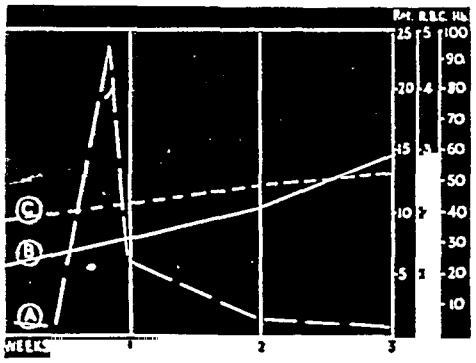
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Medical Memoranda

Unusual Dislocation of the Carpal Bones

It is thought that the following case is worthy of record owing to its unusual character.

CASE REPORT

A soldier aged 21 came to hospital on the morning of December 10, 1940, complaining of pain in his right wrist. Earlier that morning a lorry, whilst backing, had compressed his right hand and forearm against a wall. The elbow was flexed at the time so that the force was an impacting one, tending to drive the carpus proximally.

On examination there was considerable radial deviation of the wrist, and the lower end of the ulna was very prominent. Any attempt to move the wrist passively caused great pain.

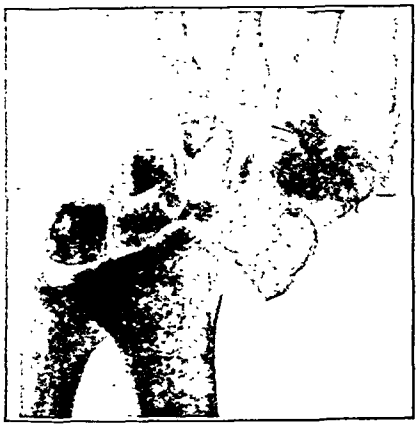


FIG. 1.—Radiograph showing gross dislocation of the carpal bones and fracture of the scaphoid.

A radiograph (Fig. 1) showed a gross dislocation of the carpal bones, with a fracture of the scaphoid. The only bones remaining in the correct anatomical position were the semilunar and the proximal third of the fractured scaphoid. The

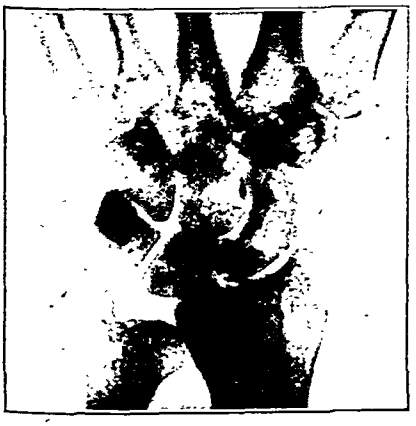


FIG. 2.—Radiograph showing the position after reduction.

others, including the distal two-thirds of the scaphoid, were displaced upwards, backwards, and towards the radial side of the wrist. The cuneiform was occupying the normal site of the scaphoid and was overlying the proximal fragment of the latter. Thus the appearance was that of a "trans-naviculo-perilunar dislocation" as described by Böhler (1935).

The dislocation was reduced under general anaesthesia. A calico bandage was passed round the arm for counteraction and the elbow was flexed to a right-angle. Strong traction was then exerted on the wrist for about ten to fifteen minutes; the carpal bones were also slightly manipulated. A second radiograph (Fig. 2) showed that the position after reduction was satisfactory. A volar plaster slab was then applied with the wrist dorsiflexed, and the patient was admitted to the fracture ward. A few days later a plaster bandage was applied to complete the plaster. He was discharged in plaster on December 23, his finger and thumb movements being very good.

On January 1, 1941, the plaster was removed and the wrist radiographed. It was thought that his scaphoid showed signs of commencing union, and he seemed to be doing very well. Another plaster was applied.

I wish to thank Mr. W. Harvey Gervis, surgeon in charge of the fracture clinic, Kent and Sussex Hospital, Tunbridge Wells, for permission to publish this case and for his help and advice.

LESLIE G. SCOTT, M.B., B.S.,
Late House-surgeon, Kent and Sussex Hospital, Tunbridge Wells.

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Lobectomy for Bronchiectasis in an Infant

The following report of a case of bronchiectasis in a young child treated by lobectomy has some features of interest.

CASE REPORT

The patient, a female child aged 19 months, was a twin weighing 4 lb. 5 oz. at birth; her twin brother weighed just over 5 lb. Up to the age of 6 months she was healthy, but remained under weight. She then developed a "cold" and ever since has coughed up offensive sputum which made her sick as many as five or six times a day. She had a chronic nasal discharge, was always listless, took little interest in her surroundings, and became pigeon-chested.

On examination the left lower lobe of the lung was seen to be the seat of the trouble. There was pronounced clubbing of the fingers and the temperature was raised and very irregular. The motions were offensive, and there was constipation. Owing to the poor condition of the child no bronchogram was taken, but postural treatment was tried, with little success, for two months. On September 12, 1940, a bronchogram showed considerable bronchiectasis of the left lower lobe, with large numbers of saccular dilatations. On November 16 the child was transferred to one of my beds at the Sheffield Royal Infirmary, and, after some pre-operative treatment, an operation was performed on November 21. A preliminary attempted artificial pneumothorax revealed that the lung was adherent, so that it was possible to perform the operation of lobectomy without further treatment.

The chest was opened by the usual incision in the sixth intercostal space and the lung separated from the thoracic wall. The roof was defined and clamped with a tourniquet, and the lung removed. The cavity left was drained under "automatic suction" drainage. There were no post-operative complications, and on December 9 the child was sent back to the Children's Hospital to complete her convalescence.

Pathological examination of the excised lung showed extensive saccular bronchiectasis, the cavities for the most part being filled with pus. It is probable that the lobe was of the congenital cystic variety and became infected at the age of 6 months. As the lipiodol did not fill the upper lobe it is not possible to say whether there were saccular dilatations in it or not.

After her return to the Children's Hospital she developed chicken-pox, and shortly after recovering from this she had measles, but in spite of all her troubles she was very well when seen at the end of January, 1941. She was then quite a different child; she played with toys, was cheerful, and had a good appetite and a good colour.

I am unaware of any case in which a lobectomy has been performed at such an early age, though I expect there are some.

Sheffield. A. W. FAWCETT, F.R.C.S.

Reviews

RADIOLOGY OF HEAD AND NECK

The Head and Neck in Roentgen Diagnosis. By Henry K. Pancoast, M.D., Eugene P. Pendergrass, M.D., and J. Parsons Schaeffer, M.D., Ph.D. (Pp. 976; 1,251 illustrations. 69s.) London: Baillière, Tindall and Cox.

To ensure that the criticisms which follow are read in proper perspective, let it first be stated that *The Head and Neck in Roentgen Diagnosis*, by such a distinguished team as H K. Pancoast, E. P. Pendergrass, and J. P. Schaeffer, is a book of first importance to radiologists. It is a large book, of 976 pages and 1,251 illustrations, and, as may be deduced from its title, is designed in unusual form. This arbitrary division of the subject through the root of the neck leads to some difficulties. For instance, in many bone diseases the authors are driven beyond the limits imposed by the title in order to give a reasonable description of the condition as a whole. Again, the upper part of the trachea and oesophagus and the lung apices fall within the ambit of the book, but not the superior mediastinum or the rest of the lungs. This format has, however, one great advantage. It presents, collected in one volume, a mass of information for reference in cases in which the lesion is manifestly located in the head or neck.

In the preface the authors state their aim to be to correlate radiology "with the apposite facts in developmental and adult morphology, physiology, pathology, and observations in clinical medicine and surgery and the special branches." The turgidity of this phrase can be matched by much of the writing of the book. Indeed, throughout the whole book there is a prolixity that makes the reader long for the use of the terse phrase and the simple word. One feature that will strike him is the detailed nature of the anatomical descriptions. Often these are of the greatest value, and give data not readily available elsewhere. Here and there they are redundant, as on page 22—"From each alveolus, projecting downwards, are the upper teeth. In apposition with the upper teeth are the lower teeth, which project upwards from the alveolar process of the mandible." Again, on page 55, "The oral cavity is largely obscured by the teeth, which project downwards and upwards from the upper and lower jaws respectively." Resolute pruning would reduce the size of a second edition and add to its usefulness.

The first four chapters deal with the anatomy of the skull, fractures and other bone lesions, and tumours of the scalp, skull, and spine. These are generally excellent, but one or two minor points might be corrected—for example, the term "desiccation necrosis" on page 165 (dissecting necrosis?), and the statement that Ewing's tumour of long bones has no characteristic *x*-ray appearance. The term "increased radiability" on page 267 is not a happy one. The section on the teeth is very good, and especially the anatomical description. The chapters on the nose, lacrimal apparatus, sinuses, and temporal bones occupy 170 pages and are particularly well done. The description of intracranial tumours and cerebral pneumography takes up 230 pages, and is the most important section of the book. It is an admirably complete account of the subject. The last section, on the neck, deals with such varied subjects as the pharynx, larynx, trachea, oesophagus, cervical pleura, the thyroid and other glands, and, finally, the cervical part of the spinal cord.

In conclusion, there is a wealth of information in these pages, and as a book of reference it is invaluable. The authors deserve congratulation on producing a work of outstanding merit, and one which is recommended to all diagnostic radiologists.

ADVANCES IN FOOD-CANNING

Canning Practice and Control. By Osman Jones, F.I.C., and T. W. Jones, B.Sc. Second edition. Revised and enlarged. (Pp. 312. 32s. net.) London: Chapman and Hall, Ltd. 1941.

The second edition of *Canning Practice and Control*, by O. and T. W. Jones, which appears within three years of the first, has been enlarged to keep pace with recent advances. One of these is "high short" processing, in which high temperatures are applied for short periods. According to the heat penetrability of the food treated the periods may range from a few seconds upwards. The shorter the time the better is the quality of the finished article. Fruit juices can be flash-pasteurized at lower temperatures than most foods, since the bacteria which they contain are feebly heat-resistant. A new chapter is devoted to the packing of foods in glass. The heavy-calibre glassware necessary is subject to stresses during heating. Faults in fresh consignments may be thrown into prominence by means of a "strain-viewer," using polarized light. Specially annealed glass is relatively heat-proof, but the general tendency in the processing of foodstuffs put up in glass is to employ a moderate temperature and give a longer exposure. Another new section is that upon the thermophilic bacteria. It is said that these organisms are less likely to cause spoilage in foods canned for the home market than in those exported to the Tropics, the reason being that home air temperatures are seldom high enough to favour the vegetative development of thermophil spores. It is believed that sugar and starch are the principal vehicles for the introduction of these germs into canning factories. The book is handsomely produced and copiously illustrated. It is, like its predecessor, a valuable and instructive guide to the principles and procedure of the important industry with which it deals.

SKIN HYPERSENSITIVENESS

Dermatologic Allergy. An Introduction in the Form of a Series of Lectures. By Marion B. Sulzberger, M.D. (Pp. 540; 13 colour plates, 39 illustrations. 47s. or $8.50 post paid.) Springfield and Baltimore: Charles C. Thomas; London: Baillière, Tindall and Cox. 1940.

Dr. Sulzberger is certainly one of the most prolific and industrious writers on dermatology at the present time. No fewer than three fat volumes are credited to him (it is true not without collaborators) within a single year, and the one now before us is the fattest. This is not surprising in view of the immense field included in the term "allergy." It may not be generally remembered that the word was originally coined by von Pirquet in 1906 to express the phenomena of hypersensitiveness in animals artificially immunized against various diseases, and Sulzberger has done a service to the modern generation by reprinting in this book a translation of von Pirquet's original paper. But the applications of the term have gradually been extended, and the present author defines it as any specific alteration in the capacity to react which occurs in living organisms or tissues upon exposure to either living or inanimate agents or substances. Hence there is exceedingly little difference between allergy and hypersensitiveness, and we are still unable to understand why it was necessary to coin this new word. Sulzberger thinks differently, but we do not think he puts up a very strong case.

However, the term "allergy" has undoubtedly established itself and has come to stay. It will be seen that in its comprehensive sense it includes pretty well every manifestation or symptom of disease which can be found on the skin. Not only are serum eruptions and urticarial rashes to be regarded as manifestations of allergy, but all the

exanthemata, the rashes of syphilis, the various forms of tuberculous disease, drug eruptions, and in fact every variety of skin eruption for which the proximate cause or agent is known is described as allergic to that agent. So the chief skin diseases which are not yet included among the allergic states are psoriasis and lichen planus, simply because we do not know their aetiology; and, when we do, no doubt they too will be considered as manifestations of allergy. There is therefore no reason to be surprised at the size of Sulzberger's treatise on the subject, and we haste to add that it is a mine of information. There is also a chapter on the future probable or possible developments of the subject. He thinks that improvements in present methods may lead to specific prophylactic measures in many diseases with the same success that has already been attained in small-pox and diphtheria, also that non-specific measures may help by preventing the occurrence of damaging forms of specific reactions by fortifying the constitutional defences by all sorts of different means, such as diet, elimination of septic foci, administration of hormones, regulation of electrolytes, etc. In other words, he thinks that there is a great future for preventive measures in medicine. We fancy that the same conclusion might have been arrived at more simply.

Perhaps the chief value of this book is that it gives so full a summary of all the work that has been done on skin-hypersensitiveness for the last thirty years, and the classificatory tables and lists of tests and of various antigens will be found most useful. Like most American publications, the book is excellently got up and the printing, paper, and illustrations are above reproach.

CHEMOTHERAPY OF BACTERIAL INFECTIONS

Essentials of Modern Chemotherapy. By Various Authors. Edited by Sir Humphry Rolleston, Bt., G.C.V.O., M.D., F.R.C.P., and Alan A. Moncrieff, M.D., F.R.C.P. "The Practitioner" Booklets. (Pp. 104. 6s.) Published by "The Practitioner" in conjunction with Eyre and Spottiswoode, Ltd.

A series of papers which appeared in the *Practitioner* in January, 1940, on treatment with sulphonamide compounds has now been published in the form of a small book entitled *Essentials of Modern Chemotherapy*, a somewhat more comprehensive title than its contents justify, since it deals with no other forms of chemotherapy than those recently introduced for the treatment of bacterial infections. The authors of these papers have revised them in the light of fresh knowledge acquired during the past year, and they afford a useful practical guide to the treatment of streptococcal, pneumococcal, gonococcal, and meningococcal infections. There is also a chapter on chemotherapy in the acute specific fevers and a new one on the use of sulphathiazole in staphylococcal infections. In a work so arranged, and of comparatively small size, other and less generally familiar aspects of the subject are naturally less fully dealt with; the treatment of gas gangrene and the local application of sulphonamides to wounds, for instance, are mentioned only in an appendix which briefly conveys the instructions on these subjects issued in official memoranda since the outbreak of war. A chapter on the treatment of urinary infections might usefully be added in any future edition.

Notes on Books

Professor WILLIAM BOYD'S *Pathology of Internal Diseases*, the third edition of which has appeared (Henry Kimpton, 30s.), is a deservedly popular book, attractive by reason of both its lavish illustration and engaging style. The picturesque touch is freely used to interest the student and leave a vivid impression on his mind: this is achieved both by choice of language and by the citation of extreme cases, such as the silicotic lung which had to be cut with a saw. Many subjects have been rewritten in this edition or discussed for the first time. These changes as a whole add much to the value of the book, although individually some of them occupy little space; extrarenal uraemia for instance, makes its appearance with a paragraph of only eight lines, which might well be amplified considerably. The close relation between pathology and clinical medicine for which the author has always striven is maintained not only throughout the text but by numerous photographs of patients, illustrating such features of disease as deformities of various kinds and abnormal gaits.

The innovations in the third edition of L. C. PETER'S book on *Extra-ocular Muscles* largely concern orthoptic training the scope of which a cautious but useful assessment is given. The chapter on nystagmus has been expanded, but still remains a rather confusing mass of isolated details. The book is published by Henry Kimpton at 21s.

Preparations and Appliances

EFFICIENT SULPHANILAMIDE INSUFFLATION

Mr. A. R. HODGSON writes from the Norfolk and Norwich Hospital:

In the treatment of compound fractures and extensive muscle lacerations, few can doubt that the use of sulphanilamide powder locally prevents much sepsis. Of the methods of applying the powder, opinion is unanimous that insufflation is the best. It ensures an even film of powder over the damaged tissues, resulting in maximum adsorption and thorough penetration.

In the Orthopaedic Department here we have been using the Evans Sons Lescher and Webb insufflator, which gives a very fine and intermittent spray. This spray has been found to be too fine, and not of sufficient penetrative power for compound fractures and severe muscle lacerations. A far greater, and if possible continuous, positive pressure is needed to produce an adequate flow of sulphanilamide powder.

This has been achieved by using an oxygen or carbon dioxide cylinder as a source of positive pressure. The apparatus is fitted up as follows. A four-foot length of pressure rubber tubing is connected up from the cylinder to the insufflator. A cylinder with both fine and coarse adjustments should be used. A further length of sterile rubber pressure tubing is fitted from the insufflator to the wound; generally about nine feet is sufficient. A glass nozzle may be fitted to the free end of the sterile tubing. The coarse adjustment of the cylinder is turned on. The fine adjustment is then turned on slowly until a fine spray is obtained. The nozzle is now turned towards the wound and held about two inches from it. The sulphanilamide powder forms a "frost" over the damaged tissues. When all the wound is covered by this "frost" of powder the cylinder is turned off. The positive pressure can be regulated, giving a variable sulphanilamide spray with varying penetrative power. This method has been found to be both simple and effective by those who have used it.

No toxic manifestations of any severity have been observed from the local application of sulphanilamide. Amounts far in excess of the recommended dose of 15 grammes have been given with no ill effects. In some cases of severe multiple injuries doses of 50 to 60 grammes have been given. The dose is that amount needed to cover the injured tissues with a "frost" of powder. When large amounts are used the breath has an odour of garlic. Slight cyanosis may occur with massive doses. In only two cases have I seen a sulphonamide rash; they were both having 1 gramme sulphanilamide orally, four-hourly, in addition. The rash disappeared within forty-eight hours of stopping the oral sulphanilamide. No case showed a pathological decrease of the white blood cell count.

Care should be taken when insufflating small penetrating wounds, such as those due to bomb fragments. Excessive pressure will strip the superficial fascia from the deep fascia, and balloon up the skin. No harm has come from the introduction of either oxygen or carbon dioxide into the wounds: they may have a beneficial effect.

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DYSPEPSIA AND CARDIOVASCULAR NEUROSES IN WARTIME

This war has so far produced no new diseases and the number of physical and psychological casualties from total warfare has been far smaller than was anticipated. The two disorders which have attracted most attention are peptic ulcer and effort syndrome, and here there has been no change in incidence and severity, but merely a shift in outlook and perspective. The physician who has been so fortunate as to work at a hospital which serves a fair sample of the population, and which has the resources to investigate its cases fully, knows that peptic ulcer is a common cause of dyspepsia. The pathologist of such an institution finds not only the scars of ulcers but unhealed craters in a surprisingly high proportion of subjects whose notes in many cases bear no record of treatment for indigestion. When men suffer from peptic ulcer in civil life they are enabled to carry on by readjustments of diet and by occasional periods off work, which in cases of declared ulcer average about a month every year. Such forms of adaptation are rarely compatible with combatant service, and the presence of an ulcer therefore means the rejection or discharge of a man from the fighting Services unless he is possessed of very special experience or gifts to outweigh his disability. The physician trained in civil practice has been slower to recognize a type of dyspepsia, familiar to the Army doctor, which occurs in young men who pass abruptly from a sedentary to a strenuous existence and suddenly double or treble their food intake. This is a transient disturbance, comparable with the belly-ache of the school-boy who overeats, and it is in the highest degree undesirable that such patients should be submitted to a full-dress gastro-enterological investigation. Such a practice is known to create invalids, whereas the dyspepsia can be simply relieved by a few words of advice and reassurance. There is therefore nothing very mysterious or specific to this war in dyspepsia in soldiers, and the most important conclusion to be drawn is that our facilities for the diagnosis of ulcer in peacetime and our methods of treatment are still very unsatisfactory.

The physician in hospital practice in civil life has also been seeing in recent years an increasing number of patients, mainly females, who are referred for investigation on a suspicion of thyrotoxicosis, which proves not to be present. These cases, according to the order of presentation of symptoms and his individual bias, he diagnoses as cardiovascular neurosis, neuro-circulatory asthenia, vasomotor instability, or anxiety state. Spence[1] pointed out that, although such patients show tachycardia, the sleeping pulse rate may be normal, the typical exophthalmos, tremor, and fidgetiness of Graves's disease are absent, and there is often a history of nervous breakdowns in the past or of having always been delicate; the symptoms may have been precipitated by a period of mental stress, anxiety, or overwork. The cardiologist, too, knows these patients well, and Bourne[2] described a group of them, in whom the presenting symptom was inframammary pain, under the somewhat unfortunate title of "angina innocens" in our columns a few years ago. Bourne pointed out that the pain differs from that of organic heart disease not only in its location but in several other characteristics. The pain has no quantitative relation to exercise and is chiefly noticed after the exertion has ceased, when it may persist for some hours. It can also be produced or accentuated by excitement, and in a few cases it is followed by a feeling of faintness or actual fainting. When the presenting symptom is dyspnoea on exertion the disturbance is referred to as effort syndrome. Paul Wood,[3] whose Goulstonian lectures we have had the privilege of publishing, disagrees with this name on the ground that the symptoms are those of fear and anxiety, not of effort, and he uses the eponymic diagnosis of Da Costa's syndrome. We would prefer to follow the Standard Classified Nomenclature of Disease and include the various conditions mentioned under the comprehensive title of "cardiovascular neurosis." Whatever the divergence in nomenclature, there is general agreement about the facts, and our knowledge is not only ably reviewed but also extended and systematized in Paul Wood's lectures.

Cardiovascular neurosis is not a wartime disease, and it is more common in females than in males. It becomes apparently more frequent in wartime because sufferers tend to seek a sheltered existence, and it is only when they are called upon to bear the full heat and burden of the day that they become casualties. Wood believes that the condition arises when the emotion of fear becomes attached to the idea of exertion. A boy's first symptoms may occur during a game of football, when he is afraid of bodily hurt, and subsequent exertion evokes the same symptoms of dyspnoea, palpitation, and prostration to which this first fear gave rise. The fears and the symptoms are often perpetuated by the parents. It is as disastrous for a child to grow up in a neurotic home as in a tuberculous one, and a good deal might be said in favour of a Grancher system to protect children from the familial contagion of neurosis. The psychological background of effort syndrome has been explored by Wittkower, Rodger, and Wilson,[4] who believe that in all cases the syndrome is antedated by a character disorder. A fairly high proportion of their patients were over-conscientious and over-scrupulous, qualities which had made them useful members of the community in peacetime, but there was a general lack of toughness and joy in living which ill fitted them for the rigours of camp life and the battlefield. Among precipitating factors emotional disturbances were commonest and were of a type to which the patient had been previously sensitized. Other factors were over-exertion and febrile illness, most commonly a respiratory infection. Caughey[5] has emphasized the importance of convalescence from acute illness in the

[1] *St. Bart's Hosp. J.*, 1936, 44, 9.

[2] *British Medical Journal*, 1937, 1, 695.

[3] *Ibid.*, 1941, 1, 767, 845.

[4] *Lancet*, 1941, 1, 531.

[5] *The Practitioner's Library of Medicine and Surgery*, New York, 1931, v, 7.

development of psychosomatic disorders. In addition to the physical effects of the disease process and the inherent recuperative powers of the organism, the convalescent period is complicated by the subconscious effects of the care and attention lavished upon the sick person, and the problem of his real desire to return to an active struggle against the forces of his environment. In the last war Bridgman[3] made careful estimations of the time required after various illnesses before the soldier was fit for full military duty. The average interval was 31 days after influenza, 34 days after tonsillitis, 58 days after pneumonia, 77 days after scarlet fever, and 50 days after herniotomy. These are much longer periods than the average medical practitioner would probably have suggested, and they emphasize the importance of intelligent medical supervision and military discipline if the soldier is to be completely cured and returned to the fighting line as promptly as possible. The physician must both realize the need for a period of rehabilitation and at the same time take pains to avoid any suggestion of cardiac disease.

The diagnosis of effort syndrome is based on the frequent occurrence of neurosis in the family history and previous history, and the characteristic symptoms of breathlessness, palpitations, fatigue, sweats, nervousness, dizziness, and left thoracic pain. Important signs are the anxious appearance, the cold blue hands, the instability of the pulse, blood pressure, and respiration, the inability to hold the breath, the sweating on the palms, and the poor physical development and asthenic posture. Symptoms are rarely if ever confined to exertion. They may occur at any time of the day or night and they are invariably evoked by emotion. Moreover, the individual symptoms are unlike those of heart disease. The dyspnoea is a rapid shallow breathing or inability to obtain a satisfying breath, and the sweating is confined to the palms of the hands and the axillae. Paul Wood has made an experimental study of the inframammary pain and produces good evidence that it arises in the muscular or fibrous tissues there, most commonly as a result of fatigue or strain of the respiratory muscles from the disordered breathing; a number of additional factors determine its localization to the left side. Secondary constellations of symptoms may group themselves around the main symptom-complex, and the hyperventilation syndrome is not uncommonly observed. In differential diagnosis it is to be remembered that a cardiovascular neurosis may be superimposed on an organic lesion of the heart, such as early mitral stenosis, which in itself should be symptomless. The prognosis depends largely on the personal and family history and the number of abnormal signs present; in any event it is poor. Few men with a personal and family history of neurosis or effort syndrome will make good soldiers, and, like those with a history of peptic ulcer, they should not be enlisted. Nevertheless the syndrome can be induced in adult life, and the battalion medical officer must be watchful to nip such cases in the bud. When a man complains of cardiac symptoms due to excitement, terror, or suppressed emotion, the medical officer must have the courage to say explicitly that there is no cardiac disease and the symptoms are natural and transient emotional responses. Some of the younger medical officers who come straight from hospital show a regrettable inability to take a careful family and personal history or to make a clinical diagnosis without a second opinion or elaborate special investigations. The place to prevent psychological casualties is in the front line, and the methods are those of general practice rather than the hospital ward.

[3] *Arch. intern. Med.*, 1919, 24, 65

THE A.M.A. CONSPIRACY TRIAL

The long trial for conspiracy of the American Medical Association, along with certain other medical bodies and eighteen responsible officials, ended on April 4 with the somewhat illogical verdict of "Guilty" against the A.M.A. and three other bodies, and "Not Guilty" against the individuals. A Federal statute called the Sherman Act prohibits combinations or conspiracies in restraint of trade in the District of Columbia. Strangely enough, for the purpose of this Act the practice of medicine is trade, but carpentry and by inference, other industries are not. A company called "Group Health Association Incorporated" was formed to provide medical services on a flat-rate prepayment basis, employing salaried practitioners. The policy of the A.M.A. is that doctors should be paid fees for service. Accordingly the Association and certain other bodies connected or in sympathy with it organized a campaign against the Group Health company. In the course of this they threatened such of their members as should become members of the staff of Group Health, or who should consult with members of its staff, with disciplinary action: and induced hospitals to deny facilities to medical practitioners employed by Group Health. The United States Government prosecuted them under the Sherman Act, alleging that their campaign constituted a criminal conspiracy.

As Associate-Justice James M. Proctor explained to the jury in his summing-up,[1] a conspiracy is committed when two or more persons combine to do an unlawful thing, or to do a lawful thing by unlawful means. It is not essential that all details of the plan be specifically arranged, or that the particular acts of each conspirator be definitely assigned; it is enough if there has been a meeting of minds for concerted action to gain the common end. All need not know each other or meet together at any one time, nor need all combine at the start of the conspiracy. Membership of the defendant medical societies, presence at their meetings, or knowledge of an unlawful plan would not alone make a person a participant: he must also have a positive intention to give adherence and support to the criminal scheme. The case for the Government was, he said, that the medical societies were opposed to Group Health and its plan, that they feared competition by the fixed-prepayment method of practice as against the free-for-service method, and that to obstruct and destroy such competition they conspired to impose restraints on medical practitioners affiliated with Group Health by threats of expulsion, by denying them professional contacts and consultations with other practitioners, and that the medical societies were opposed to Group Health doctors facilities for treating their patients. This plan, the prosecution said, was carried out by enforcing compliance with a statement known as the Mundt resolu-

[1] *J. Amer. med. Ass.*, April 12, 1941, p. 1760.

tion of the A.M.A. (which set out the position, the Association's attitude towards it, and the methods proposed to deal with it), implemented by a "white list" and aided by corporate and individual acts of the defendants. On the other hand, the defendants contended that there was no purpose or plan to restrain Group Health, the hospitals or doctors; that their acts were intended only to oppose Group Health by legitimate argument and persuasion; that no coercion was practised or intended against the hospitals; and that the "white list" and disciplinary proceedings against members represented reasonable action taken by authority to protect the organization and its standards of medical practice; and that if those actions interfered with Group Health and its doctors the effect was an incidental and indirect result of acts done legally and in good faith for legitimate ends.

The learned judge pointed out that reasonable discipline and control of members of a society are essential, but they cannot be justified where the real purpose or the natural results of their exercise are to interfere with free competition. Refusal to consult with particular physicians is not in itself illegal, but it may be illegal if done in furtherance of a conspiracy. A doctor may refuse to treat patients in a particular hospital, but if a group of doctors carrying out a concerted scheme refused to treat patients in order to injure the business of the hospital they would act illegally. The defendants were not entitled to oppose Group Health in a manner intended to restrain its operation, but they had the right of legitimate criticism, argument, and persuasion, however persistent and severe, either separately or by collective effort; if such opposition did not take the form of a conspiracy to restrain, it did not violate the statute. Similarly, the "white list" and the Mundt resolution were not wrongful in themselves, but only if perverted to advance the aims of a conspiracy. The same law applies to the action of hospitals in withholding privileges from certain practitioners.

The conviction of the corporations with the acquittal of the individual members directing them has naturally puzzled critics throughout the whole of the United States, and possibly elsewhere. In this country a corporation cannot be charged with a crime, and such a prosecution would have had to be brought only against individuals. The acts alleged against the defendants in this case could not be made the basis of a criminal prosecution here, though they might form ground for a civil action. The history of the British Medical Association does in fact contain, a generation ago, a civil action of this kind. However inconsistent the decision of the American jury may appear, it seems to have decided practical advantages. The *Washington Post* remarks (April 6) that the effect of the verdict is to stop the A.M.A. and the associated societies from interfering with the Group Health Association or other group practice enterprises which may fill a social need in present times. On the other hand, the verdict leaves no reflection upon the well-known medical practitioners and officials who were indicted for conspiracy, and recognizes that they had no intention of acting illegally. The finding may yet be reversed on appeal, and so the position cannot now be regarded as settled. The Sherman Law may possibly have to be reconsidered before the case is finally decided.

DESTRUCTION AT THE ROYAL COLLEGE OF SURGEONS

We are glad to supplement last week's article published at page 830 under the above heading and make certain corrections. Much further information is now available which the medical profession will wish to have at the earliest moment. With regard to the pictures and the Library, which were scarcely mentioned in our report, all the College portraits, except a very few having little artistic or historical interest, were sent away before the outbreak of war. Nearly 90,000 volumes from the Library have been sent to various parts of the country, the transfer being aided by a generous grant from the Rockefeller Foundation. The only books now standing on the shelves are standard textbooks; these and some current periodicals have been kept for reference. The principal treasures of the Library had been sent away before the outbreak of war, and none of the books remaining at Lincoln's Inn Fields has suffered damage in air raids. In addition to the specimens which were reported last week as safe, we are happy to learn of many others that escaped. The basement of the College covers a very wide area, and not more than one-fifth of it was involved in the fire. Many rooms and a number of cellars in which specimens were placed for safety were unaffected. The more important specimens had been taken to a tunnel below the basement and surrounded by sand; others were placed in branches from this tunnel. Some of the tunnels, already very strong, had been specially reinforced. All the specimens in the main tunnel and the majority of those in the branches were saved from destruction. The important College records and historical documents had been sent away. Only the working records dealing with the distribution of those specimens which had been placed in the basement and sub-basement for safety, and the records of pathological specimens presented to the College during the last few years, were destroyed. The preservation of copies of the Museum catalogues had been carefully considered and appropriate steps taken. All were saved with the exception of the catalogue of part of the Pathological Section, and that of the Curio Room, but nearly all of the specimens in this room are described in the "Guide to Surgical Instruments and Objects in the Historical Series." No fewer than 3,750 of the Hunterian specimens which are safe have already been catalogued, and it is expected that this number will be increased. The original Gibraltar fossil cranium is safe; and while much of the teratological collection was lost, the major part of the collection, consisting of 950 specimens, has been saved. Ninety-five specimens, or rather more than one-third, of the Onodi collection are safe. The greater part of the large collection of instruments is also safe and can be restored. Among the instruments that are intact are the Lister, the Moynihan, and the Chinese and Japanese collections; also the series illustrating the evolution of anaesthetic apparatus.

Thus, though the loss that the Museum has suffered is grievous, and much of it is irreplaceable, the destruction of specimens is not quite so great as was at first feared. Enough has been saved to form the basis of the new Museum, which will continue the Hunterian tradition.

NEW SULPHONAMIDE COMPOUNDS

A series of reports from the United States shows that rapid progress is being made there in synthesizing and testing new sulphonamide compounds. We have already referred in this *Journal* to sulphadiazine (2-sulphanilamidopyrimidine), a drug with properties which at least in the pharmacological sense represent an immense advance. These are fully confirmed in a careful study of its absorp-

tion, distribution, and excretion by O. L. Petersen *et al.*[1] Higher blood levels are attained with this drug than with any other sulphonamide compound, and sustained longer, so that it evidently need not be given more often than six-hourly. The concentration in the blood plasma exceeds that in the blood cells, an advantage shared with sulphathiazole; on the other hand, where sulphathiazole is at some disadvantage—namely, in reaching the cerebro-spinal fluid in a concentration only one-third of that in the blood—sulphadiazine resembles sulphanilamide and sulphapyridine in attaining a concentration two-thirds of the blood level. Conjugation is slight and not progressive the acetyl compound being readily excreted. More welcome to patients themselves than any of these properties will be the fact that this drug does not cause nausea or even mental depression. It is known to be active against all the chief infections amenable to sulphonamide treatment, but comparative studies of therapeutic efficacy have yet to be made.

Two other new compounds have made their appearance in America, neither of which seems at first sight to have such outstanding properties as sulphadiazine, although each has its interesting points. "Promin" is the name given to the sodium salt of *p.p'*-diamino-diphenyl-sulfone-*N.N'*-dextrose sulphonate, and a series of papers by J. A. Toomey and his colleagues[2] records some preliminary clinical trials with it. This drug is best given intravenously in 5-gramme doses thrice daily; oral administration is said to cause more toxic effects, and to have also the disadvantage of irregular absorption. It appears from these studies only that the drug is reasonably well tolerated and has an action comparable with that of sulphanilamide on streptococcal infections. A more remarkable action is illustrated in the work of W. H. Feldman *et al.*[3] on experimental tuberculosis in the guinea-pig. The drug was here fed to the animals with no apparent difficulty or ill effect, and seems to have retarded the progress of the disease after inoculation with virulent tubercle bacilli in a very striking way, but the experiment was complicated by intercurrent infection and needs to be repeated. It was shown some years ago by Rich that large doses of sulphanilamide retarded the development of tuberculosis in the guinea-pig to some extent, but the effect achieved here was evidently greater.

A third new compound on trial in America is sulphanilylguanidine, which has quite different properties and uses. Owing to its low degree of solubility and slow absorption, it is possible, as E. K. Marshall *et al.*[4] have now shown, to maintain saturation of the intestinal contents with the drug, while the blood concentration remains low. It has accordingly been used, and with some success, in the treatment of bacillary dysentery. This is perhaps not quite as hopeful a sphere of action as, for instance, the urinary tract, but anything with a specific local effect on intestinal infections, even if less sure and speedy than what we can now see elsewhere in the body, will be a welcome innovation.

[1] *Amer. J. med. Sci.*, 1941, 201, 357.
[2] *J. Pediat.*, 1941, 18, 1, 8, 10.
[3] *Proc. Mayo Clin.*, 1940, 15, 695.
[4] *Johns Hopk. Hosp. Bull.*, 1941, 68, 94.

EMPLOYMENT OF WOMEN IN INDUSTRY

The medical problems, many of them with a sociological bearing, which have been created or intensified by the recent entrance of large numbers of women into industry were debated at a meeting of the Association of Industrial Medical Officers held recently in London. Dr. M. L. Dobbie-Bateman, in opening the discussion, based her remarks on the sickness records for the five years 1935-9 of a group of about 6,000 people employed in a retail distributive house, the sexes almost equally represented. The average annual number of days lost through sickness for each male worker was 4.01 and for each female worker 6.36. An analysis of the conditions which caused sickness showed in respect of diseases of the genital organs a 500% excess among females over males, but the total number of days lost in this group was so small as to be almost statistically negligible, being only 0.24 out of 6.36 for the female worker, and 0.04 out of 4.01 for the male. The same applied to the 200% excess amongst female workers on account of dental disease. Respiratory diseases accounted for just about half the total of sick absenteeism, and here the female excess over the male was 75%. Only in respect of diseases of the locomotor system and of accidents were the male figures in excess of the female. Dr. Dobbie-Bateman's conclusion was that there was a consistently higher sickness rate among women employed in industry, that gynaecological conditions did not entirely explain the excess, and that a large part of the female disability was due to the fact that the working woman tried to do two things at once—to earn her living and to be responsible for her household duties. Miss F. I. Taylor, Deputy Chief Inspector of Factories, said that in peacetime the women working in factories were mostly young; the average life of a woman in a factory was reckoned at ten years, from school-leaving age until 24, but now there was a tendency for older and married women to be employed. One important consideration was the hours of employment. Peacetime restrictions in this respect could not be maintained, and longer hours were being worked than those concerned with factory welfare could approve, but, generally speaking, an endeavour was made to keep the working week below 60 hours and to ensure that every woman had one day off in seven or two in fourteen. A return from 5,000 factories showed that nearly half of them were working over 56 hours but under 60. The disadvantage of over-long hours was illustrated by the experience of a factory which had been working 54 hours and found it impossible to maintain production until every third week the hours were reduced to 48. Dr. L. S. Swanston, medical officer at one of the new ordnance factories, mentioned that the incidence of rejection on medical grounds among women applicants for employment was only 7% to 8%; on the other hand, the standard was not high. In her own department, during 1940, 52 women reported pregnant. As soon as this happened the woman was taken off night shifts and overtime, put on sedentary work, and examined every fortnight. She remained at work until the seventh month and was allowed to resume work one month after confinement. In the subsequent discussion it was urged by more than one speaker that women should not be allowed to continue until as late as the seventh month, and that to resume one month after confinement was far too soon, having in view the health not only of the mother but of the child. Dr. Swanston wanted to see the factory medical service extended to include ophthalmic and dental treatment; the amount of dental sepsis she had seen among these girls was astonishing. She also urged the appointment of a panel consultant in each district upon whom the factory medical officer could call in difficult cases. Dr. Graves Peirce described the work of women on the railways, which in peacetime is chiefly clerical or canteen, but now embraces many unfamiliar roles—porters, ticket collectors, van guards, even engine cleaners and loaders of goods trains, and, in one district in Scotland, platelayers. These women had not yet been working, he said, sufficiently long for sickness figures to be of any value, but the most outstanding thing in his experience had been the genuine enthusiasm of the women for this work, which, being mainly out of doors, was to many a welcome change from ordinary factory life, and their health did not seem to have suffered.

CHEST SURGERY IN WAR

This is one of a short series of articles based on lectures given at the British Postgraduate Medical School, Hammersmith

ABDOMINO-THORACIC INJURIES

BY

GORDON GORDON-TAYLOR, O.B.E., M.A., M.S., F.R.C.S., F.R.A.C.S.

Temporary Surgeon Rear-Admiral

Popular opinion is accustomed to associate penetrating injuries of the trunk with grievous mortality, and statistical inquiry only too truly confirms the fatality of wounds implicating the thoracic or abdominal cavity under conditions of modern warfare. The ancients knew the lethal character of wounds of this portion of the human frame; it suffices to mention here the wound of Eurymachus from the arrow from Odysseus's powerful bow, and the injuries inflicted upon Polydorus and Tros by the great Achilles or on Sarpedon by the spear of Patroklos—all these abdomino-thoracic wounds recounted in the Homeric epics proved fatal. The English stage and Scottish history also testify to the gravity of the abdomino-thoracic injury: in Shakespeare's drama, Macbeth unseamed Macdonald from "nave to chap" in the manner of one accustomed to wield the claymore. The backhand of the claymore could easily split a man from clavicle to thigh: many of General Mackay's soldiers perished in this way, endeavouring with their muskets to protect their heads and trunks in that fierce overwhelming rush of Graham of Claverhouse's men at Killiecrankie.

The surgery of those regions which adjoin the midriff is not entirely modern. The behaviour of wounds of the diaphragm received in warfare has been known to surgeons since the days of Ambroise Paré, and was accurately noted and discussed by Guthrie when writing of the war surgery of the Napoleonic era. The surgical treatment of thoracic wounds by Guthrie and by Baron Larrey, Napoleon's Surgeon General, has proved no inaccurate presage of the modern treatment of gunshot injuries of the chest. In respect of the repair of visceral injuries on the abdominal aspect of the diaphragm, over six centuries have rolled past since Henri de Mondéville counselled suture of the colon and affirmed the recovery of some of those who had received wounds of the large intestine.

Injuries which involve thorax, diaphragm, and abdomen may be of penetrating or of non-penetrating character. In the war of 1914-18 the first-named group completely overshadowed and outnumbered those which were subparietal lesions.

ON PENETRATING ABDOMINO-THORACIC INJURIES

In one series of cases from the war of 1914-18 (Sir Cuthbert Wallace, 1922) abdomino-thoracic cases constituted 12% of the abdominal cases which reached the casualty hospitals of an army; the operations performed on this group of patients also accounted for 12% of all the abdominal operations in that army. In the Spanish Civil War the proportion of abdomino-thoracic wounds in all wounds of the belly admitted to a hospital of first urgency was not dissimilar to that which obtained in 1914-18—i.e., 11% (Jolly, 1940). Abdomino-thoracic injuries formed 9% of a certain series of thoracic cases admitted to a "clearing station" (Gordon-Taylor) during 1918.

Statistics of abdomino-thoracic wounds culled from the Official History of the War of 1914-18 demonstrate that in a vast majority the abdominal lesion determines the gravity of the prognosis, and, further, that wounding of the hollow abdominal viscera greatly augments the fatality of the injury. The most fleeting glance at any anatomical atlas will demonstrate those organs most likely to suffer in abdomino-thoracic injury (Figs. 1 and 2). It will at once be apparent that the anxieties occasioned by a wound of the left dome of the diaphragm must greatly exceed those which are aroused by right-sided penetration of the midriff.

In a series of addresses on various aspects of the surgery of the chest by different lecturers it is obviously desirable to aim at some uniformity of nomenclature, classification of wounds, etc. I therefore make no apology for utilizing the excellent classification of penetrating abdomino-thoracic wounds given by my friend Tudor Edwards:

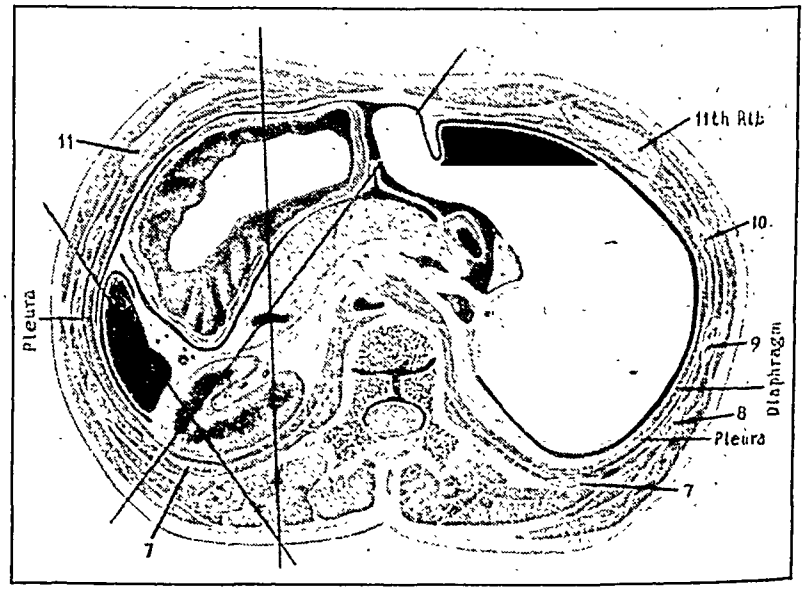


FIG. 1.—Horizontal section through abdomino-thoracic zone to demonstrate the organs liable to injury in penetrating wounds of this area.

1. The chest and abdomen may be penetrated by separate missiles, the wounded man sometimes becoming a veritable St. Sebastian, his abdomen and chest riddled with fragments of high explosive or machine-gun bullets.

2. Missiles may penetrate the chest, and may emerge through the abdominal wall or be retained within the belly; on the other hand, the track of the missile may be in the reverse direction—the wound of entry in the abdomen and the fragment retained within the thorax.

3. Traversing wounds of the lower chest, especially if inflicted during expiration, may pass through the diaphragm and occasion damage to the abdominal organs lying immediately subjacent to the midriff.

4. Tangential wounds of the lower thorax in which considerable damage, including diaphragmatic injury and perfora-

tion, is produced by the missile and in-driven fractured ribs ("stove-in chest").

The Diaphragmatic Lesion

The injuries of the diaphragm in abdomino-thoracic lesions are mostly in the sloping muscular portion, and are specially frequent where this lies in contact with the thoracic wall. In cases that come to operation the rent is usually small; in one series the linear tear was half an inch long or less in 50% of the cases. Many openings are mere punctures; larger irregular apertures in those suitable for surgery are seldom found to be more than one and a half to two inches in diameter.

Lockwood and Nixon (1918) compared the cardiac and respiratory embarrassment due to a rent in the diaphragm to that produced by an open pneumothorax; on the other hand, Sauerbruch writes that the importance of the diaphragm in relation to respiration and the circulation has been exaggerated. The great improvement in the recovery rate of abdomino-thoracic cases after the diaphragm began to be sutured by British surgeons in the last war may have been partly due to the repair of that muscle but also to the improved treatment of the thoracic condition and increasing familiarity with the many problems of war surgery. Small wounds undoubtedly heal spontaneously, and others are at least temporarily plugged by omentum, spleen, liver, stomach, etc.

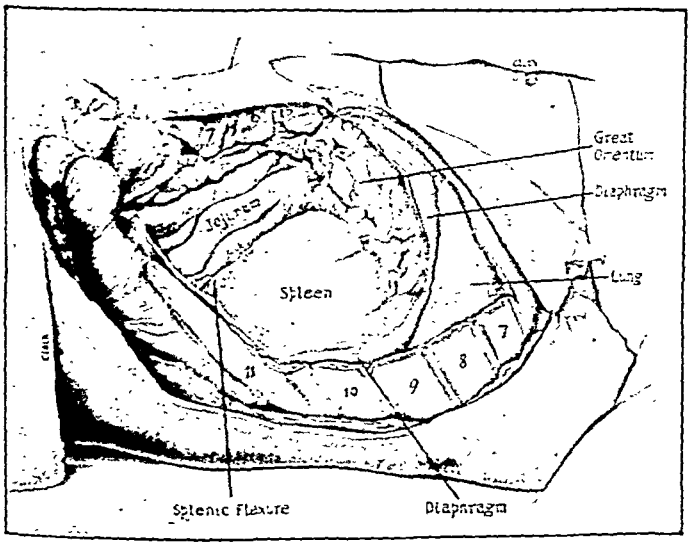


FIG. 2.—Dissection of the left-sided abdomino-thoracic region, showing viscera liable to injury in penetrating wounds. (Prepared by Prof. John Kirk, Middlesex Hospital.)

Wounds of the central tendinous part are obviously more serious than those at the periphery, but some survive. A century ago Guthrie published notes of a man with a wound of pericardium, left ventricle, lung, liver, and the tendon of the diaphragm. The man survived for four or five months; he suffered from palpitation and uneasy sensations in the chest, and died of bronchitis. Fuchsig (Sauerbruch and O'Shaughnessy, 1937) successfully operated upon a stab wound of the right ventricle which also perforated the central portion of the diaphragm. The track passed obliquely inwards from the fifth sterno-chondral articulation, and was thought before operation to implicate the stomach.

Diagnosis of Penetrating Abdomino-thoracic Wounds

Doubt may be felt at first whether the gravity of the condition of a man with an abdomino-thoracic wound is due to the thoracic, to the abdominal, or to other concomitant injury. Nixon (1919), who had great experience of these cases, writes that if there is a fair air-entry into the lungs thoracic injury is not to be held accountable.

The anatomical site of the aperture of entry and of exit of a traversing wound of the trunk limns the track of the missile with fair accuracy. The position of the patient at the time of injury also demands consideration; the structures probably damaged can then be readily adumbrated. In cases in which a fragment of metal, spicules of broken rib, etc., are retained, *radiological investigation* is indispensable; its necessity in estimating diaphragmatic movements and thoracic pathology cannot be overestimated. There are also clinical signs and symptoms which arrest attention and which may clarify, or may, on the other hand, obscure, the diagnosis.

1. *Abdominal rigidity* does not of necessity betoken involvement of the subphrenic viscera. It is well known that injuries of the pleura or lung, especially if situated in proximity to the diaphragm, may occasion abdominal rigidity and may arouse suspicion of an abdominal lesion: (*a*) The abdominal rigidity associated with an injury below the diaphragm is more likely to be bilateral; in the case of a thoracic wound rigidity of the belly wall is usually confined to one side. (*b*) The abdominal rigidity accompanying a chest injury tends to be intermittent, some relaxation of the rectus abdominis occurring during inspiration.

2. Sickness and vomiting have been known to occur in cases of lower thoracic injury, but are more frequent in abdominal lesions, as is eructation of gas.

Diaphragmatic injury is suggested by an almost entirely thoracic type of respiration, with a catch at the end of inspiration, sometimes a definite spasm or hiccup; yet the actual respiratory rate may be little altered. In the late stages of injury to the diaphragm there is fixed pain, exaggerated on exertion and referred to clavicle or scapula according to the position of the injury or location of the retained missile. Pain is induced especially by lifting, coughing, or even deep respiration. The diaphragm is kept motionless on the affected side.

The diagnosis of a wound of the diaphragm is not easy in subparietal injuries. The syndrome of tension pneumothorax may be simulated by the sudden irruption of stomach or colon into the chest. *Radiology* and the determination of the intrapleural pressure enable a correct diagnosis to be attained.

In the case of penetrating injuries the decision as to the time of operation, the type of surgical procedure, and the chronological sequence of the stages of the undertaking will depend upon: (*a*) the degree of shock and collapse of the patient; (*b*) collapse of the opposite lung, as suggested by intense dyspnoea, cyanosis, and respiratory retraction of the chest wall on the contralateral side (in such a case the administration of an anaesthetic and a thoracotomy in the last war usually proved fatal; (*c*) the experience and judgment of the surgeon.

The existence of blast-contusion of the lung is now well established on clinical and *x*-ray evidence and by post-mortem findings, yet it may be only the index of perhaps graver changes in the organs below the diaphragm. Other serious cases may have been in very close proximity to detonating bombs, and may be suffering from a dangerous and grave degree of saturation of the blood by explosive gases, such as carbon monoxide or nitric oxide. The

severity of the clinical state may even be due to such lesions as myocardial trauma. Such possibilities should not be overlooked amid the circumstances of this "total" war; their presence and the existence of other grave multiple injuries heavily load the scales against recovery.

Penetrating Injuries by Large Missiles

The injuries produced inside the abdomen by large fragments of metal or other foreign body are *almost always irrecoverable*; the result is scarcely likely to be different in those wounds if more than one cavity of the body is implicated. I have, however, figured elsewhere a piece of brass tubing, 4⅜ inches long, removed from a Greek soldier, who recovered after the simple extraction of the missile, which had passed from the middle of the right scapula and projected in the epigastrium (Gordon-Taylor, 1939).

Saint (quoted by Gordon-Taylor) had a successful right-sided abdomino-thoracic case, in which a fragment of shell weighing two ounces had traversed chest, diaphragm, and liver and produced two perforations of the duodenum and one in the hepatic flexure of the colon.

In one of my patients, the successful result of whose case is recorded elsewhere, a missile weighing nearly four ounces produced the most grievous damage inside the belly, and fractured the bony wall of the thorax (Gordon-Taylor, 1919). The diaphragm was apparently uninjured, and a strict observance of the approved nomenclature must therefore exclude this case from the category of the true "abdomino-thoracic."

(The second part of this paper will appear in next week's issue, and will contain a list of references.)

FEEDING IN WARTIME

No. 9 of the Wartime Nutrition Bulletin (May and June, 1941) summarizes the latest food facts and makes some observations and recommendations which merit attention.

Sugar and Jam

It believes, for instance, in the psychological value of the jam spread for the average child. The Ministry of Food, concerned to provide a scientifically balanced diet, may overlook these minor yet pressing questions of home life: "What can we have with our bread at tea-time to-day?" and "What is there to give the children for a treat?" The Children's Nutrition Council considers that it would have been well worth while to hold more stores of sugar in reserve. There are large West Indian surpluses available. Great Britain consumed before the war about 2½ million tons of sugar a year. Rationing has reduced this to less than 1½ million tons, of which half a million will probably come from home-grown sugar beet, leaving 1 million only to be supplied from abroad. When it is realized that 350,000 tons are available from Java and India alone, and that the Empire countries are capable of producing 1½ million tons, it will be seen that the world surplus of this commodity will be enormous.

Bread and Wheat

Wheat production is in a similar position. Most of the Australian wheat crop of 1939-40, which totalled 195 million bushels, was purchased for either export or home consumption; in fact, however, it has been possible to ship only 45 million bushels, and in December, 1940, there were 110 million bushels in hand for storage. In the last war Canada's wheat acreage was expanded from 10 to 17 million acres; in this war the position will probably be reversed. By August there is likely to be a surplus of 570 million bushels, and the total storage capacity of the country is only 470 million bushels. Storage on farms or in improvised elevators is not practicable owing to the numbers of mice and beetles that congregate in these places. Meanwhile in England we are assured that there is sufficient grain in the country and that bread is not likely to be rationed. It is not anticipated that barley or potato flour will be used, but if this should be necessary the new types of brown flour will have prepared the population for change.

The brown versus white bread controversy is still being influenced by milling and baking interests, and although the new standard loaf has become a familiar object there are areas where it is slow in making an appearance. The conflict between commercial and scientific interests is complicated by the movement away from the big mills, which are often situated in vulnerable areas, to the smaller inland mills, which are now being reconditioned. These small mills are often well fitted to produce good quality wheatmeal flour, but are at a disadvantage in manufacturing the highly processed modern white variety.

Milk

The most important factor influencing milk yield is the quantity of protein concentrates in the fodder. This is, unfortunately, higher in food coming from abroad than in home produce, so that the total milk yield is practically certain to diminish with the coming winter. It will, however, be a help if farmers can make good silage and hay from the reduced grassland now left to them. "Unprofitable" cows are being removed from the dairy herds in order to conserve food for the higher-yielding animals, but the lack of skilled farm labour may begin to have an effect upon the quality of the stock. Experience is needed in detecting abnormalities at an early stage, and if mastitis is allowed to flourish it will affect both the yield and quality of milk. It is an unfortunate result of the ploughing-up campaign that dairy farmers are obliged to spend much of their time on land cultivation. There is, too, a shortage of skilled labour in the pasteurization plants, and distribution is becoming increasingly difficult. For this reason particular care should be taken to prevent wastage through souring during the warm weather. Much of the surplus summer milk, an extra 10% beyond the normal spring flush, is being condensed, dried, or used for cheese-making. The Children's Nutrition Council considers it advisable to import during the summer as much dried milk and dried skim-milk as possible, so as to provide for the winter and early spring of next year.

Shortage of labour and difficulties of distribution are having an adverse influence on the amount of milk being made available for school children. School authorities are now acting on the recommendations of distributors that (a) the "sale or return" system is no longer justified; (b) milk should be delivered once only during the day and to one point in each school—not to several classes as formerly; (c) more care should be taken to return bottles. Board of Education Circular No. 1548, issued on April 17, admits that it will be necessary in many areas to supply milk in bulk rather than in third-pint bottles. Delivery in pint or quart bottles is, however, considered preferable to churns. Parents are asked to provide cups or beakers for the term, and the importance of cleansing these is stressed.

Vitamin C

The importance of vitamin C for children is being continually stressed. One South Midlands town is now ordering in bulk 10,000 synthetic tablets for each of ten welfare centres. If tablets are purchased in quantities of 50,000 the price is 23s. 6d. per 1,000. They are sold to mothers at a farthing per two daily doses of 12½ mg. each. It is pointed out that advertisements for products containing vitamin C are often misleading. Vitamin C may in fact be present, but in insufficient quantities.

Communal Feeding

A picture of communal feeding—the example being an East Anglian industrial town—is given by the Nutrition Bulletin. The town is an evacuation area but few people have left it. The Town Council has borne the primary cost of the five or six feeding centres which have been established, and the Ministries have now approved the scheme. The first established centre provided meals between 12 and 2 o'clock for shifts of 60 people. Numbers rose from 127 on the first day to a regular attendance of between 250 and 320. These figures were not affected by the opening of a second centre

close by, which was serving 200 people a day by the end of the first week, and many had to be turned away. Customers included a few children and an even proportion of men and women. These came mainly from factories, foundries and shops, and there were a few office workers. As a result of the success of these centres, the Feeding Committee hope to start a school feeding scheme—which this particular town has so far been lacking—if the Education Committee contributes towards the cost. Expansion of the present centres will be made to cover all school districts. The cost of meals, exclusive of overheads which cannot yet be estimated, is at present 4½d. to 4¾d. per head, the average payment being 3¾d. Children will be given a three-course meal for 4d. These low prices depend upon the purchase of bulk supplies of non-perishable foods such as dried apple rings. No tea is provided as the shift system of meals makes this difficult, but milk is sold at 2d. a cup and is popular. Local diet experts consider that the meals are well balanced, though there may be a deficiency of vitamin D.

Equipment has been expensive and there has been delay in delivery, apparently because the Ministry of Food will not help local authorities working on their own initiative so readily as they will help schemes working under their direct supervision. The limitations of the equipment and also the size of the available premises, mean that very large centres cannot be organized, and the scheme as yet covers a very small fraction of the population. But the Committee is confident that it will be possible to expand sufficiently to provide meals for all who require them, and official quarters have intimated that, if 40,000 of the population (mainly women and children) should have to be compulsorily evacuated, then the centres may be called upon to feed the workers for two meals per day. Clearly, therefore, the scheme may perform work of vital importance in maintaining health and efficiency during an emergency.

JUVENILE RHEUMATISM AND THE SIGNIFICANCE OF "GROWING PAINS"

LECTURE BY DR. JANET AITKEN

A holiday course in physical education was arranged by the Ling Physical Education Association at Bedford, when a number of lectures were delivered by various authorities, including Dr. Vaclav Benes of the Czecho-Slovak Ministry of Foreign Affairs, who spoke on education in his country, with special reference to the Sokol; Mr. Claude Bridges of the Middlesex Education Committee, who spoke on the gymnastic teacher and the law; and Miss P. C. Colson of the Government's Directorate of Physical Recreation, who described the manner in which physical recreation was being organized nationally. There were also practical classes and group discussions.

The first lecture in the course was on rheumatism in school children by Dr. JANET AITKEN, senior physician, Elizabeth Garrett Anderson Hospital, of which we give a brief summary.

The Question of Diagnosis

After referring to the very large amount of industrial incapacity resulting from diseases classed as rheumatism, and discussing the still obscure aetiology of the acute and subacute forms, Dr. Aitken took up the question of diagnosis, with special reference to "growing pains." At the beginning of the century growing pains were largely ignored by the medical profession, but during the last fifteen years perhaps an undue stress had been laid upon their importance, and in some quarters they were considered synonymous with juvenile rheumatism and the consequent danger of carditis. Limb pains in children were of two types: (1) pains which were felt in the various joints, associated in the acute phase with tenderness, swelling, and heat, and with limitation of movement in the affected part; and (2) pains which were felt in muscles or tendons, not usually tender to touch except where fibrositis was also associated. The pains in both types might be mild or severe. It was pains in the muscle which were commonly called "growing pains."

The lecturer agreed that there were numerous cases of limb pains in childhood which were not rheumatic, but she felt that the distinction was not always easy and that growing pains as opposed to arthritic pains, might be associated with juvenile rheumatism. In her series of cases, taking the rheumatic children with definite cardiac changes, the number who had muscular pains only was more than double the number who had joint pains only. It was argued sometimes that inasmuch as one-third of the children at out-patient clinics complained of growing pains, it might be expected, without associating growing pains with juvenile rheumatism, that a similar proportion of children with that complaint would also suffer from growing pains. But omitting purely joint pains which were probably included in the estimate of one-third), in her own series of cases of rheumatic carditis, at least 70% suffered from growing pains. It was also stated that young adults with mitral stenosis often affirmed that they had never had growing pains; but she had had opportunities of proving on a follow-up clinic how unreliable such histories might be.

Methodical Investigation

Dr. Aitken went on to describe in detail her method of investigation in a case of complaint of growing pains:

1. Careful consideration should be given to the possibility that some orthopaedic condition might be the cause of the pains.

2. If no cause was found and the general health was good, no treatment was necessary beyond general instructions about diet and hygiene.

3. If the general health was poor further search for the cause of the pains must be made, including the possibility of malnutrition, anaemia, and any chronic disabling disease. Should no definite cause be found the possibility of juvenile rheumatism remained, but the case should not be labelled rheumatic unless and until definite signs of that disease were present.

4. Should the growing pains persist and the health remain poor, a week or at most a fortnight in bed would very commonly result in cessation of pain and a sustained improvement in health.

5. If the pulse during sleep was raised after a week's rest and there had been even slight fever, further investigation should be undertaken. A sedimentation test was of value and an electrocardiogram might reveal some abnormality. Enlargement of the heart was, of course, of importance, but even with the help of *x* rays minor signs of enlargement were difficult to determine. Except in cases of gross cardiac disability, physical exercise was not contraindicated if under proper supervision, and massage and graduated exercise were very important during convalescence following an acute attack.

In conclusion, she said that juvenile rheumatism, though just as frequent in its occurrence, was not nearly so severe as it was ten or fifteen years ago. Gross cardiac lesions were rarely seen. This might be due to a natural cycle of severity and mildness, or, more probably, in part to an improvement in general hygiene and child welfare and in part to the greater interest taken in the prevention of disease by the medical profession and by workers in public health.

The May issue (No. 9) of *Tin and its Uses* contains a survey of the Tin Research Institute's report for 1940, describing recent technical and commercial developments in the use of tin. Important commercial applications may be found for a combined pickling and tinning process described in this issue. Another article describes the development of the Institute's chemical process for producing protective films on tinplate. The results of canning trials indicate that the film is effective in preventing sulphur staining when used for meat packs, and good results were obtained with some vegetables. *Tin and its Uses* is obtainable free of charge from the Institute, Fraser Road, Greenford, Middlesex.

Reports of Societies

TRICHINIASIS IN MAN

At a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on May 23, with Dr. J. A. GLOVER in the chair, the subject of discussion was "Factors Influencing the Presence of Trichiniasis in Man."

Aetiology and Clinical Features

DR. P. B. BEESON of Harvard University said that few cases of trichiniasis had been recognized in Great Britain until recently, but the disease was fairly widespread in many temperate regions, being commonest perhaps in the United States, but very well known also in Germany and Poland. The parasite *Trichinella spiralis* had been known for over a century, and as far back as 1860 trichiniasis was shown to be responsible for severe clinical illness in man, and it was discovered that the disease was contracted by eating the pork of infested swine. Almost any animal which ate meat was liable to the disease, and it had been discovered in at least twenty-five different species. But beef, mutton, poultry, and fish did not come from animals liable to contract the disease. In the United States, where up to 5% of swine had trichiniasis, the chief factor responsible was the feeding of swine with uncooked garbage. In Britain there was little opportunity for this means of swine infestation, and the probability was that the rare cases of swine infestation which did occur in this country were acquired by eating infested rats. Trichiniasis had been found in rats in several areas.

Within the past few months several human outbreaks had been reported in different parts of England and Wales and had evoked a new interest in the clinical and epidemiological aspects of the disease. Since the beginning of this year over 200 cases of fairly severe illness due to trichiniasis had been recorded. Sausage appeared to have been the meat responsible for these local epidemics. Rationing of meat and changes in the composition of sausages had brought about a condition whereby an unusually large number of people ate the meat of a single animal. Furthermore, in view of the fact that a partially protective immunity developed after the attack of trichiniasis, the comparative susceptibility of the British population might have led to the development of more clinical cases than would have resulted from similar exposure of a population previously exposed.

Cooking was a certain means of killing any parasites which might be present in meat, but it might be inferred from the number of cases which had resulted from the eating of sausage that the temperature level necessary for the killing of the parasite was not always obtained in the frying of sausage. Ham and bacon were less dangerous because they underwent some preliminary process of salting or smoking. Refrigeration was not such a certain means of killing the parasite.

During the process of digestion the larvae were set free in the upper part of the small intestine. Here the parasite matured and copulated, the female burrowing into the bowel wall and releasing the embryos, which went into the blood stream and eventually found lodgment, perhaps in the muscles, where they might live for many years, or in the brain, heart, or lungs, where they usually excited a rather acute inflammatory reaction which succeeded in killing the parasite. The clinical syndrome had four cardinal features—fever, oedema of the orbit, eosinophilia varying from 15 to 40%, and muscle pain, often very severe, most prominent at the back of the neck, around the elbows, in the lower part of the back, and in the calves of the legs. Irritation in the lungs could produce a clinical resemblance to pneumonia. Clinical recovery usually began about the second or third week. Complete recovery was the rule. Clinical manifestations were confined to the earlier period of the infestation. Many more cases of latent trichiniasis than of the clinical disease were recognized. Two important factors influencing the clinical manifestations were the size of the infecting dose of the parasite and the resistance or susceptibility of the host. The size of the infecting dose was perhaps more important in this parasitic disease than in bacterial and virus diseases because there was no possibility of multiplication in the body of the host. Once the female had deposited its embryos no further reproduction could take place. The disease which resulted depended upon the reaction of the individual to the invasion.

In a group of six persons all of whom had had apparently the same amount of contaminated meat, four might be entirely well, one mildly ill for three or four days, and the sixth suffer from severe illness lasting for weeks. It had been shown in the case of animals that one infestation protected to a considerable extent against subsequent infestations. The clinical cases in the United States numbered about 600 in a year. In this country there had lately been three outbreaks in different towns with fifty or more cases in each, and it was likely that many hundreds of other persons were mildly ill at the same time. The only factor which seemed partly to explain why the disease should crop up at the present time was the killing of older sows for sausage meat, such sows being more likely to have been infested than the younger pigs. The most important measures of prevention were to warn the public against the dangers of eating raw or underdone pork and to intensify the campaign against rats.

Sources of Infection

PROF. R. T. LEIPER agreed with Dr. Beeson that the cause of recent outbreaks was not the rearing of pigs on swill at the same time, the widespread collection of garbage was a danger to this country. At Wolverhampton, where there had been an outbreak, an examination of 145 rats brought in by ratcatchers showed 2 to be positive. At Penrith 164 rats were examined, and 9 were found to be infested; all the infested rats had been caught at the refuse dumps, none of those caught at the sewage works were infested. He gave figures for trichiniasis in Germany in recent years. In 1922 for example, 110 cases were notified, with 1 death; in 1930 95 cases with 13 deaths; in 1934, 44 cases with 1 death. Swine infestation in the Dutch East Indies was interesting: here from 5 to 7% of female pigs were infested, and very few male pigs, but in the Dutch East Indies, although the dog was markedly susceptible, there was no recorded trichiniasis in man or in the rat. In other parts of the world the susceptibility of the cat was evidenced.

Members of Prof. Leiper's "team" and others described special investigations. Miss M. YOUNG gave an account of the examination of cysts in a number of cases coming to necropsy in the Wolverhampton district; the cause of death had been generally some cardiac condition. In 6 out of 47 such examinations it was evident that there had existed a subclinical infestation with *Trichinella spiralis*, though never diagnosed in the life of the patient. It appeared from her investigation that a certain amount of trichiniasis was endemic in the Black Country. Dr. PHYLLIS CLAPHAM mentioned some experiments which suggested that the host species played some part in determining the rate at which the female parasite matured and the embryos were liberated. Mr. J. W. G. LEIPER described clinical manifestations of trichiniasis in the pig. Dr. W. P. ROGERS illustrated the metabolism of rats with trichiniasis, a study which indicated the possibility of a biochemical diagnosis.

Dr. R. H. H. JOLLY (M.O.H., Wolverhampton) said that actually there had been 98 cases in Wolverhampton, and the epidemic covered a period of thirteen weeks. The source was traced to meat supplied very largely by three wholesale dealers. Should these outbreaks be attributed to the habits of the people or to the fact that there was a residual trichiniasis in the pig farms in that part of the country? He was of opinion that both factors came in. In 280 families in Wolverhampton, or 37% of those investigated, an admission was obtained that raw sausage was eaten, either by the housewife or by other members of the family.

FORTY YEARS OF UROLOGY

The annual meeting of the Section of Urology of the Royal Society of Medicine was addressed by Sir HUGH LETT, P.R.C.S., on his forty years' experience in that specialty. In no branch of surgery, he said, had diagnosis been brought to such a high degree of accuracy. The outstanding factors in urological progress were the discovery of *x* rays and later the development of pyelography, the remarkable evolution of the cystoscope, the tests for renal



A MAN AGED SIXTY COMPLAINED of IMPOTENCE

"... He was a thoroughly healthy man with increased subcutaneous fat on his breasts, abdomen and buttocks. ... After a preliminary course of injections ... potency was regained ... and local inunction of an ointment was started.

"Apart from the maintenance of sexual function, the most obvious effects have been the new growth of hair and an increase in virility enabling this patient of 60 to play 36 holes of golf without undue fatigue."

See "Percutaneous Absorption of Male Hormone," Lancet, p. 1284

NEO-HOMBREOL

TESTOSTERONE PROPIONATE

Ampoules and Ointment

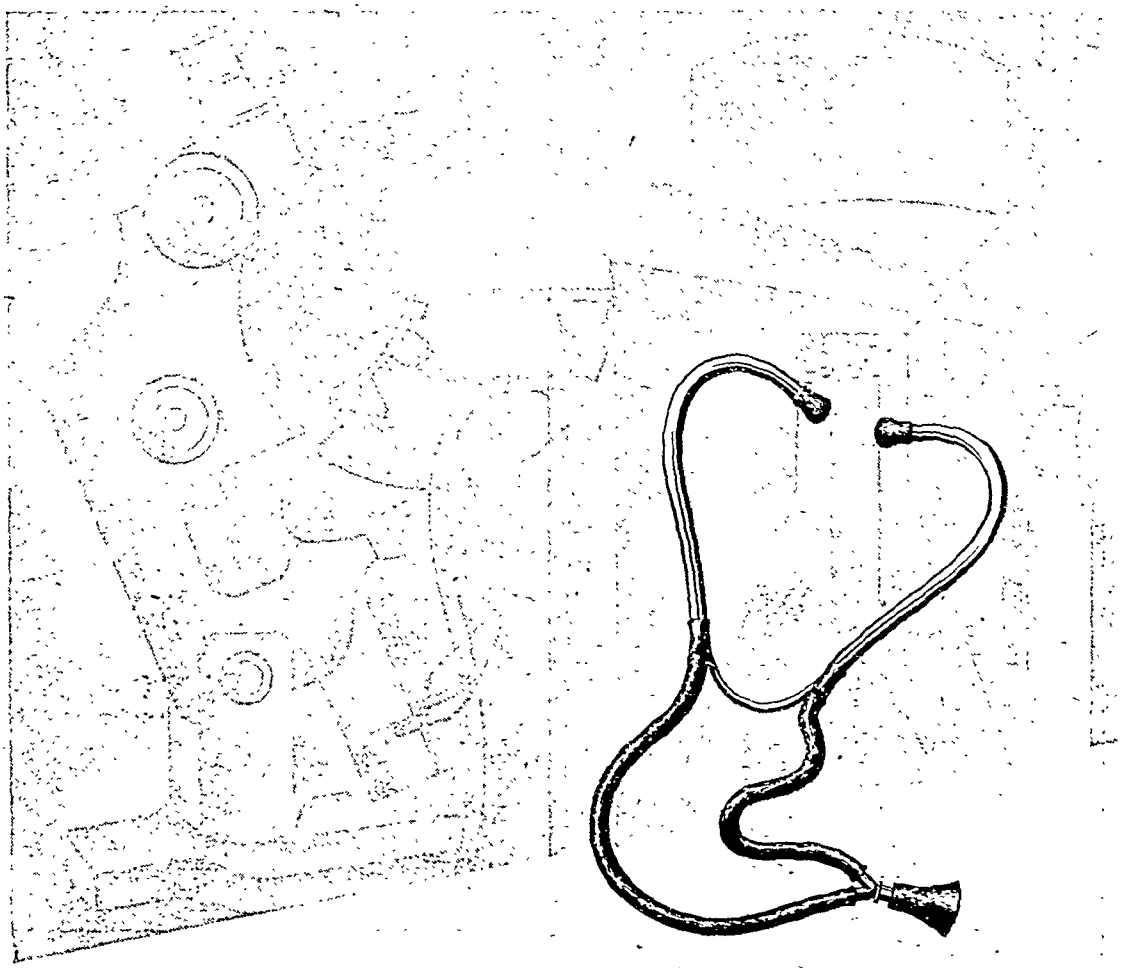
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FORTY YEARS OF UROLOGY

efficiency, and the advances in the medical treatment of urinary infections. In its early days pyelography was not devoid of risk, for collargol was employed as the opaque medium, and unfortunately it led to a fatal issue in certain cases in which the pelvis was overdistended, and as a result the calices ruptured and pyelo-venous backflow ensued. This difficulty was overcome by substituting for collargol a solution of sodium bromide or iodide, which was innocuous and proved satisfactory. But although ascending pyelography was of value in the diagnosis of obscure cases, it was not always applicable, necessitating as it did the passage of a catheter up the ureter to the renal pelvis. The discovery of intravenous pyelography was a great advance, and now the urinary surgeon would regard an operation on the kidney as unthinkable unless either intravenous or catheter pyelograms, or both, had previously been made.

Treatment of Prostatic Obstruction

The developments in the treatment of prostatic obstruction made one of the most interesting chapters in the progress of urinary surgery. For many years catheterization had been the routine. Catheter life, as it was called, was strongly condemned, and it had even been stated that patients who wholly depended on the catheter were not likely to survive for more than two years. This was not so provided that adequate precautions were taken and the patients kept under careful supervision. Sir Buckston Browne had two patients who lived to be a hundred, and for the last twenty years of their lives passed all their urine by catheter But there were cases in which catheter life was unsuitable or even impossible

Suprapubic prostatectomy was first performed by Belfield in the United States and McGill in this country In 1901 Freyer started his campaign, and by persistent advocacy made suprapubic prostatectomy the standard surgical treatment of enlarged prostate. The general mortality, however, was heavy, some patients dying from haemorrhage and some from infection, but most often the deaths were from uraemia Not until 1909 was attention drawn by Stillman to the value of preliminary decompression in these cases, either by catheter or through a suprapubic puncture but some years elapsed before its importance was generally realized The adoption of decompression in certain cases and the discovery of the tests for renal efficiency, particularly those for estimating the retention and excretion of nitrogen, stood out as landmarks in the history of prostatectomy. Any discussion on prostatectomy would be incomplete without a reference to resection by diathermy. In skilled hands this had proved particularly useful when the prostate was small or when the obstruction was caused by a middle lobe But, in this country at least suprapubic prostatectomy remained the operation of choice when the gland was much enlarged

One of the greatest triumphs in the history of bladder surgery was the destruction of vesical papillomata by diathermy, introduced by Beer in 1910. How great it was could only be realized by those who saw these cases when the only method of treating recurrences was by further operations, whereas now all that was needed was a simple treatment which could be given in the consulting-room or the out-patient department.

The Urethra and Urethroscopy

One of the considerable changes which had taken place in hospital practice during the last forty years was the decline in the number of patients who presented themselves with strictures of the urethra which were severe and almost impermeable or associated with important complications. At the London Hospital in 1897 no fewer than 50 cases of stricture were operated on, 45 by internal and 5 by external urethrotomy, but in 1937 there were only 4, all treated by internal urethrotomy. Again, in 1897 there were 19 cases of perineal abscess and 6 of extravasation, and in 1937 only a solitary case of perineal abscess. In addition, 27 cases were treated by dilatation under an anaesthetic in 1897 and 16 in 1937. These were remarkable figures. The great majority of strictures were due to gonorrhoea, the treatment of which forty years ago was limited almost entirely to drugs and local injections of astringent or antiseptic lotions by a hand syringe. It was not surprising that many patients were uncured, and only those who saw those cases and knew how difficult they were could fully sympathize with Ricord's remark, picturing hell as a place where he was surrounded by patients suffering from uncured gleet! Only when the urethroscope was modified to allow air distension did it become of real value. Then it became possible to diagnose and treat with far greater accuracy local lesions and also to discover areas of local infiltration which limited the expansion of the urethra under air distension and treat them by full dilatation with a Kollmann dilator. The value of the urethroscope in this respect was summed up by Frank Kidd, who said that with this instrument the course of a stricture could be followed from its birth until, at the hands of the Kollmann dilator, it met its death

Sir Hugh Lett concluded with some remarks on the difference between forty years ago and to-day in respect of antiseptic precautions The scanty regard paid to surgical cleanliness in those early days offered a ready explanation of the cases of perineal abscess and extravasation of urine and cellulitis that so often occurred. To-day adequate precautions were taken against infection, the urethra was carefully irrigated, and every instrument introduced into it was sterilized Instances of urinary fever were very rare in relation to the large number of cases now treated in urological clinics and out-patient departments, and the fact that so much instrumentation could be done without ill effects was a striking testimony to the progress made during the last forty years. He paid tribute to the work of British urologists—Thomson Walker, Frank Kidd, and Hurry Fenwick (the "wizard of the cystoscope"), among others.

Mr JOCELYN SWAN added a few remarks in the same vein of reminiscence Progress in urology, he said, had been due to three factors: cystoscopy, x rays, and chemistry. There had never been sufficient collaboration between the surgeon and the radiologist. Intravenous pyelography should not be entirely relied upon, because very often there was a rather doubtful shadow; it should be followed by an ascending pyelogram before the condition was determined In urological conditions, especially growths in the testes, but also in the bladder, x rays were of value in treatment as well as in diagnosis Contact therapy by the Chaoul apparatus had proved of service He uttered a word of warning against indiscriminate chemotherapy. He had seen two patients die after comparatively small doses of sulphapyridine, and he had seen other unfortunate, though not fatal, results. All cases which were given any of the sulphonamide drugs should have a forced fluid intake, and careful quantitative estimation should be made

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FATIGUE AFTER SKILLED WORK

The Ferrier Lecture on "Fatigue following Highly Skilled Work" was delivered before the Royal Society by Prof. F. C. BARTLETT, F.R.S., on May 29.

If the character and causation of fatigue following highly skilled work were to be understood, the first need, he said, was for the discovery of more relevant and experimentally controlled facts. Unfortunately almost all the investigators who had attempted to study fatigue of this type had adopted methods taken over with very slight change from those which had proved valuable in the study of simple muscular fatigue. They chose elementary operations usually considered to require some "mental" effort—such as easy calculations, word or colour recogniton, and naming and the like—repeated these operations over and over again for long periods, and tried to express the resulting fatigue in terms of the diminution in quantity or quality of the work done. The skill fatigue of daily life was not set up under such conditions. Routine repetition of simple actions was not a characteristic of any highly skilled work, and least of all of work having a strong "mental" component. The operations involved here were marked by complex, co-ordinated, and accurately *timed* activities. The stimuli in response to which these activities were set up were neither simple nor did they usually fall into an order of fixed succession. They had the character of a field, or a pattern, which had become very highly organized, and might retain its identity in spite of a great diversity of internal arrangement.

It was possible to develop fully controlled experimental situations in which these realistic considerations had full play. When this was done the picture of fatigue following highly skilled work which emerged had certain strongly marked characters. In such fatigue the "standards" accepted and followed by the central nervous system unwittingly deteriorated. The operator tended to think that he was doing better work, because errors treated as significant all the time got wider and wider limits. Until a stage of great fatigue was reached it was far more likely that the actions would be performed at the wrong times than that the wrong actions would be performed. If accurate timing was insisted upon, gross mistakes of action might appear. The stimulus field split up. Its pattern character altered. It became a collection of unconnected signals for action, with some of these predominant over all the others. Particularly stimuli which were in the margin of the pattern, not closely

organized with the central field, were ignored, "forgotten," and serious lapses of specific reactions occurred. There was a marked change in the effect of certain "distracting" or additional stimuli. Sensations of bodily origin, in particular, became more pressing and insistent and affected the performance in ways peculiar to the tired operator. Side by side with all these changes went constant subjective symptoms. Verbal reports about any circumstances connected with known failure of performance became increasingly inaccurate, and errors were regularly projected upon objective conditions, or attributed to the interference of other people. There was a tremendous growth of irritability.

In conclusion, Prof. Bartlett discussed the light thrown by this picture upon the relation of high-level central nervous functions to simpler neuromuscular mechanisms.

Correspondence

The Chronic Sick in Bombed Towns

SIR,—I am informed from absolutely reliable sources that there are still hundreds, if not indeed thousands, of "chronic sick patients" being maintained in institutions in those of our large towns which have been repeatedly bombed during the last few months. I am also informed that, despite the facts that many "chronic sick" patients have been killed and others seriously injured, and that in some instances the buildings in which they are housed have been seriously damaged with consequent great discomfort to both patients and staff, the Ministry of Health obstinately declines to remove these unfortunate bedridden patients to places of comparative safety and comfort outside our large towns.

If Hitler was our Minister of Health it would be easy to understand, but what are we to say when this sort of thing goes on unheeded in our own Christian country and yet no one makes any attempt to raise the question either in the Press or in Parliament? I may add that I have written to one of our prominent daily papers on the subject: they have simply refused to publish my letter. Why has it escaped the notice of our medical Members of Parliament, or are they afraid to raise such a ghastly injustice in the House? I am writing this letter to you, Mr. Editor, in the hope that the *British Medical Journal* will vigorously advocate immediate steps being taken to put an end to the agonizing apprehension from which these poor persons must be suffering from day to day and night to night.

Perhaps it might be worth while adding that the accuracy of the statements made to me can easily be tested by a question in the House as to the numbers of such persons still being housed in public health and public assistance institutions as well as voluntary hospitals and homes for incurables in London and other large towns.—I am, etc.,

Criccieth, May 22. FREDERICK MENZIES.

Control of Tuberculosis

SIR,—In these days of strain and hustle of war, tuberculosis is apt to be forgotten or shelved. Dr. James Maxwell's article (May 3, p. 665) on the dangers from the tubercle carrier is a timely reminder and warning, and should indicate that there are defects—serious defects—in our tuberculosis service. Are we on right lines? The facts outlined by Dr. Maxwell would seem to show that we are not. Year by year we spend large sums on sanatorium treatment—treatment which is costly and disappointing when compared with other standards in medicine. We patch up lungs and perhaps add a year or two to the life of the consumptive, but massive infection and bad home conditions still hold sway and account for thousands of cases of tuberculosis every year. The death rate has fallen certainly, but tuberculosis still attacks the person we can least afford to lose—the young adult. Yet we allow the open case or carrier to leave sanatorium, with or without consent, to return home to infect others. In time these contacts themselves become tuberculous and find their way to our orthopaedic hospitals and sanatoria; and so the vicious cycle is complete.

Our costs are increasing, taxation (local and national) is increasing, and our post-war commitments are likely to be on a colossal scale. Let us therefore direct expenditure on tuberculosis into channels most likely to produce results. Prevention is still the keynote to success. After twenty years' experience in tuberculosis I would suggest the following:

(a) Select a number of sanatoria up and down the country where up-to-date treatment and diagnosis can be carried out and pool the beds. Divide the country into regions and then invite local authorities to join together to share these beds. This would allow the smaller and poorer authorities to get over the difficulty of providing costly sanatoria of their own. If fresh air and rest is all that is required, this could be carried out at home under the supervision of the medical attendant. Confine admissions only to such cases as will respond to skilled treatment—that is, to some form of collapse therapy. Stop crowding our sanatoria with chronics and incurables.

(b) Adequate accommodation for the segregation of open and advanced cases. It should be incumbent upon every scheme-making authority to provide this in institutions near the homes of the patients and in the substandard sanatoria. Regard tuberculosis as an infectious disease and make the segregation of open cases or carriers compulsory until such time as they can be rendered safe. The present law requires amending to simplify its application.

(c) Compel local authorities to provide adequate housing accommodation for its tuberculous population—subsidizing the houses if need be.

(d) Introduce a pension scheme for tuberculosis. It is well known that poverty and privation lead to a furtherance of the disease in families. Link this scheme up with an extension of the training college and settlement scheme on Papworth principles, with at least one colony for each region.

(e) A stricter control of the milk supply.

It may be said that to carry out these proposals will add considerably to the cost of tuberculosis. The initial cost may be great, but I believe it would be money well spent and in time would reap its own reward and effect a considerable saving to the nation. I may add that these are entirely my own personal views.—I am, etc.,

Wakefield, May 14. G. E. JOHNSTON.

"Bureaucratic Surgery"

SIR,—The correspondence under this caption initiated by Mr. Norman C. Lake (April 19, p. 602) must be welcomed by all who are interested in the welfare of the E.M.S.

The improvisations of September, 1939, are evolving into a more organized service, and only those responsible for its efficiency can be fully aware of its many difficulties. These are inherent in the grouping together of varied medical services and their change over from a peacetime to a wartime basis. It is no doubt in these circumstances that "the latest orders" of which Mr. Lake complains have arisen—namely, that all head injuries should be transferred for treatment to special neurological units, the term "head injury" to include scalp wounds in which there is no evidence of bone involvement. In support of this instruction Mr. D. W. C. Northfield (May 10, p. 728) cites certain cases of bad surgery which have come to his notice as surgeon in charge of a special head centre. But, surely, ignorant surgery is not to be bettered by withdrawing all cases into special centres, but by spreading more knowledge to engender better surgery.

Without doubt, wherever it is possible to develop a highly organized service, then special centres are of the greatest value and surely welcomed by all. But, again, will either the public or even special centres be well served if it is they who are "to tackle everything"? There is surely a surgery, informed and restrained, which is immediate to the wounding, and which extends to the first hospital of reception. Few will suggest that an open extradural or sinus haemorrhage should be left to be transferred to a special centre, and, further, there is a surgery of knowledge, rather than immediate action, in the constant watch for neurological signs in the unconscious patient too ill to be moved. Again, cases of multiple wounding (and there are many of them)—say a scalp wound and a penetrating abdominal wound—immediately dispose of bureaucratic surgery and require investigation, judgment, and prompt treatment. Selection of suitable cases for transfer to special centres must vary somewhat with time and place, but with co-operation is not difficult. Selection is based on knowledge and not dangerous rule of thumb.

To the special centres the general surgeons should look for knowledge, research, instruction, and an understanding of both their difficulties and their opportunities. Good general surgeons will certainly not be made by depriving them of all their material—the *reductio ad absurdum* of the extreme specialization to which Mr. Lake refers.

The hard anvil of war has exposed many weaknesses, not the least of which, perhaps, is the unfortunate specialist who finds himself promoted "general surgeon," with many responsibilities for which he has had neither the training nor the experience. Amid the uncertainties of total war, the most generally useful tool will be the man who is well trained in the traumatology of all the systems, and his loss will be greater than any other. However, the general surgeon and the specialist are not mutually exclusive but complementary. The danger lies in promoting one at the expense of the other. Perhaps the best work of special centres will be in the training of more and better general war surgeons.

The Postgraduate School at Hammersmith has provided some excellent lectures on war surgery. Its work should be extended both in London and in the country, and its value would be greatly enhanced on the clinical side by the co-operation of the special centres. We badly need a school of military or war surgery for all who would aspire to the honour of treating the wounded.—I am, etc.,

J. M. CHRISTIE, M.B., F.R.C.S.Ed.

London, N.8, May 17.

Pulmonary Concussion

SIR,—The advantage of using the term "pulmonary concussion" for haemorrhagic lung lesions due to trauma is that it does not limit us by views on aetiology not generally agreed upon. This admission that I did not know what part blast played in causing the lesions reported (April 5, p. 506) makes the letters of Prof. S. Zuckerman and Dr. P. L. Krohn (April 26, p. 645) largely meaningless. It was shown that pulmonary concussion occurs more frequently in the victims from bombed houses—that does suggest that blast has been a factor. Necropsies on air-raid victims should be on unselected cases, as with road accidents the probability of lung lesions depends largely on the type of victim but cannot be foretold.

I hope that Prof. Zuckerman will not continue to detract from his valuable experimental work by making statements about humans which are almost nonsense—for example (1) To speak entirely in terms of wave motion in bombed houses, etc., is misleading; there has been a sudden addition of a large volume of gas which must escape. In many houses the thin dividing walls offer least resistance and probably go first. Such houses may go as a unit; I am sure I have seen some which did. The familiar mess makes the statement by Prof. Zuckerman comic relief (unless it refers to animal experiments). "If the explosion is insufficient to break the walls of an 'average' house (that is, if the explosion is a small one) the blast wave is reflected from wall to wall until its energy is absorbed and the pressure falls to that of the normal atmosphere." (2) The human factor is so variable that it would be surprising if the same lesions were found in different people after exposure to the same force (except that be, as Dr. Krohn reminds me within 10 feet of a 500 lb. bomb). Will an accurate history of the incident ever tell us if the lungs were in the inspiratory position at the time of the explosion? In bombed houses (with explosions) there will always be many unknowns. Prof. Zuckerman should realize, the extent to which he has forgotten the human factor from a fantastic comment he made on his Case 2 (*Proc. roy. Soc. Med.*, 1941, 34, 185). Case 2 was a woman in a steel shelter with three other people. A near miss displaced the shelter 30 feet. The only fatality was this woman, who sustained lung lesions. "After speculating on the cause of these lung lesions he says, "On the other hand, the possibility that she may have been directly affected by blast cannot be excluded, for it is conceivable that she was just within, and the other occupants of the shelter just outside, the cone of blast." (3) This idea of a force threshold cannot be accepted for human beings; it is how the force is applied that matters. If there is a force threshold, then the two strong men who died after simple falls (*Journal*, 1940, 2, 317) should not have done so, and a young sailor who was run over by a trailer weighing 5 tons 15 cwt. should have had pulmonary concussion but did not (case reported in *British Heart Journal* by Dr. Hugh Barber and myself).

Dr. Krohn makes the old mistake of thinking that animal results will be reproduced in detail by human beings when he speaks of the abdominal lesions. The compressive force sends the base of the lungs, etc., downwards and the abdominal organs upwards; they meet going in opposite directions; hence the lesions are typically of upper abdominal organs. Mere crushing is not the whole answer.

Many misunderstandings would be avoided if the pathology of the lesions were agreed upon. I suggest that "pulmonary concussion" be used in a broad sense for haemorrhagic lung lesions due to trauma. When, and if, a lesion caused by blast alone is proved "blast" should be in its name. Pulmonary concussion has primary, secondary, and reactionary lesions. The primary lesions are (1) phrenico-costal sinus contusion, (2) "rib markings," and (3) massive hilar contusions. These need not all be present and in severe cases may be confluent. The first two types are common in civil life, the third is rare—I believe it is brought about by a mechanism similar to the penny experiment (Sutherland, G. A., *Lancet*, 1940, 2, 641). Each alveolus with air locked in by glottic spasm and speed of compression acts as a penny and transmits the force until the immovable structures near the hilus are reached; here the alveoli are ruptured. I believe that it takes a very large force to cause massive hilar contusion and that this is the lesion Dr. Joan M. Ross (*Journal*, January 18, p. 79) speaks of as essentially a lesion of blast. The secondary lesion is multiple spots of inhaled blood; this may be so mixed with the primary lesions that it will be difficult to unravel them. Reactionary lesions still need much observation.

Further observations are much needed on:

(1) The reaction of the lung to inhaled blood. Ideal subjects for this study are suicides who shoot themselves through the head. The amount of congestion and fluid effusion into alveoli about some of these haemorrhagic spots is surprising—unlike the big primary lesions where the capillaries are compressed by the blood. This secondary lesion has been confused with the primary concussive ones in some cases which have been reported.

(2) The process by which the large lesions resolve—may cavitation follow pressure necrosis of alveolar walls?

(3) The incidence of lung lesions in minor cases.

(4) More radiological surveys similar to that of Dr. J. L. Livingstone (*Proc. roy. Soc. Med.*, 1940, 34, 90), where lesions are correlated with the "state of the patient."

Dr. Krohn shows that he does not understand the clinical problem when he says that pulmonary concussion is infrequent in hospital practice because Dr. A. M. M. Payne (*Journal*, April 12, p. 564) found no case in 226 admissions. Dr. Payne writes "from the point of view of the organizer," not the research worker. Pulmonary concussion is often a sub-clinical entity; it can frequently be overlooked with no danger to the patient; for example, a woman had a bomb injury of the brain which proved fatal after two and a half months; at necropsy I found a right phrenico-costal sinus contusion which had not been recognized and played no part in causing her death. These lung lesions are common in the wards just as they are in the post-mortem room, but they have to be hunted for in unselected cases. The subject is a research one to a very large extent, and for that reason I should like to see groups of pathologists, radiologists, and clinicians appointed to see the lungs of as many air-raid victims as possible.—I am, etc.,

G. R. OSBORN.

Derby, May 17.

Silk in the Darning of Hernias

SIR,—If Mr. Rodney Maingot, who writes on this subject in your issue for May 24 (p. 777), will refer to the *Journal* of November 25, 1922 (p. 1024), he will find a full description of the method, which I had then used for many years. It is, however, notorious that the employment of plain silk introduces a certain risk of infection even in the most careful hands, and I therefore used a method of preparation developed from that devised by Lange some thirty-five years ago. Briefly, floss silk is boiled for one hour in 1/1,000 biniodide of mercury in watery solution, transferred from this to 1/1,000 biniodide in alcohol for dehydration, and kept for storage in liquid parolein. The silk thus treated is soft and flexible, retains its full tensile

strength, and sets up no irritation in the tissues. The impregnation with a mercury salt renders it immune to early infection but does not prevent the ingrowth of tissue cells, which ultimately convert it into an inextensible structure closely resembling tendon in its histology. Lange used mercurialized silk for the construction of artificial tendons with great success, and I have myself employed it for this purpose on many occasions. It furnishes a surgical material of first-rate value and many applications, among which the treatment of difficult hernias is not the least important.—I am, etc.,

London, May 26. H. S. SOUTTAR.

Subcutaneous Ligature of Veins

SIR,—Critics of my method of subcutaneous ligature (April 26, p. 626) suggest that it is painful, dangerous, and unreliable. With your permission I shall try to correct these impressions.

Essentially, the method entails inserting one stitch in clean skin. Most doctors would agree that they can do this safely, and in fact do so on many occasions in their ordinary work. Mr. N. L. Eckhoff (May 10, p. 729) quotes cases of recurrence after saphenous ligation, but does not allow for the effect of the sclerosing injections. Combining injections and ligation enables the whole length of the affected vein to be completely blocked. Early recurrence in these circumstances appears most unlikely if venous pressure at the upper limit of the occluded portion is normal. This latter proviso must apply to any method of treatment. I agree with Mr. Eckhoff that the Trendelenburg operation is a serious business, with possibilities of disaster, and would suggest that it be reserved for the worst cases.

Dr. S. McAusland (May 17, p. 763) describes the method as "crude," and states, wrongly, that the needle is passed through the vein. The small Rotunda pattern needle is passed between the vein and the deep fascia, and with practice perforation of the vein does not occur. Using novocain as described, there is no more pain caused than an ordinary injection of sodium morrhuate would be expected to produce. "Crude" is the last word one would apply to any method which obtains the desired result with the maximum economy of effort.

My excuse for writing to you at this length is simply this. Dr. Sicard described his method of treating varix by injection in 1923. In spite of the efforts of surgeons and general practitioners, there are still thousands of people in need of effective treatment. In my own practice in two years I have found nearly forty cases requiring ligature. One can only guess at the total number in the country, but it is apparent that all the theatre staffs available could make very little impression on it.

I would urge, therefore, that general practitioners should grapple with the problem, using the method they find best, and make a determined effort to abolish varicose veins.—I am, etc.,

Bradford, May 19. H. S. RUSSELL.

Adrenal Grafts in Addison's Disease

SIR,—In their article on the treatment of Addison's disease by adrenal graft (April 26, p. 617) Drs. F. Katz and F. Mainzer say that a transplantation should not be looked upon as successful "unless there is definite improvement over a period of months in a case of undoubted Addison's disease." They could find only five cases in the literature which fulfilled these requirements, the periods of observation varying between five and twelve months. Their own case was observed for fifteen months after the operation, but, as Dr. J. J. Conybeare rightly pointed out (May 3, p. 688), the diagnosis could not be regarded as indisputable, as there was never any pigmentation of the skin or mucous membrane.

The following case shows that even an extreme degree of pigmentation of skin and mucous membrane does not make the diagnosis certain, nor does improvement lasting for two years prove that an adrenal graft has effected a cure of the disease. A man of 41 was admitted under my care at Guy's in November, 1920, for increasing asthenia with occasional vomiting since January. During this period his skin had become deeply pigmented, and there were numerous dark patches and black spots in addition to the general brown colour. Patches of brown pigmentation were present in the mucous membrane of his mouth. On admission his systolic blood pressure was 120 mm. Hg, but it fell to 80 mm. during his stay in hospital. He was readmitted in April, 1921; he was so weak that he could neither walk nor stand. Mr. W. E. Tanner then grafted into the patient's testicle the adrenal gland of an eight-months infant immediately after its death, which occurred during parturition. The patient's blood pressure rose in the next four weeks from 75 mm. to 120 mm., the vomiting ceased, and he regained his strength sufficiently to be able to do light work, but the pigmentation remained unaltered. He was shown at a meeting of the Clinical Section of the Royal Society of Medicine in February, 1922, when he was accepted as a typical case of Addison's disease apparently cured by an adrenal graft.

He remained at work for another year. His symptoms then gradually returned, and he was found to have anaemia with a high colour index, achlorhydria, and a slightly enlarged and hard spleen and liver. It was now thought that he might have Addison's (pernicious) anaemia simultaneously with Addison's disease. On June 12, 1923, his condition suddenly deteriorated, his blood pressure fell to 90 mm., and he died in July—two years and three months after the operation and three years and eight months after the onset of symptoms.

At the post-mortem the adrenal glands were found on macroscopic and microscopical examination to be perfectly healthy. His liver was cirrhotic and contained excess of iron. There can be little doubt that he died from Addison's anaemia and that this was the cause of his pigmentation. Some excess of fibrous tissue, but no trace of adrenal tissue, was discovered on microscopical examination of his testicle.

I may add that among the numerous physicians who saw the patient during the two years he was under observation, the only one who even questioned the diagnosis of Addison's disease was Dr. J. J. Conybeare.—I am, etc.

Oxford, May 21. ARTHUR HURST.

SIR,—With reference to the paper by Drs. F. Katz and F. Mainzer (April 26, p. 617) and subsequent correspondence, may I state that, although it is obviously prudent to question the diagnosis in a case of supposed Addison's disease without pigmentation, such an apparent absence of pigmentation does not signify the incorrectness of the diagnosis. Obvious pigmentation of the buccal mucous membrane is not an essential feature of Addison's disease, and pigmentation of the skin may be inconspicuous in acute cases or in fair-skinned patients. Nevertheless, a case of supposed Addison's disease without pigmentation and without the characteristic biochemical changes in sodium metabolism is not an ideal one to illustrate the apparent benefit from an adrenal graft. In my limited experience of the effect of adrenal grafts in Addison's disease the result is either negative or temporary, but others may well have been more fortunate.

The implantation of tablets of desoxycorticosterone in the subcutaneous tissue under local anaesthesia is a procedure which is effective for a period of some four or more months and can be repeated. In this connexion one must remember that desoxycorticosterone is not the only essential hormone of the adrenal gland, but the clinical effect is usually satisfactory.

Although Dr. H. M. Stanley Turner (May 24, p. 798) gives theoretical reasons for suggesting that the prognosis in women with Addison's disease would be less unfavourable than in men, in actual fact this does not appear to be the case, although occasionally one meets with a woman patient who seems to make a recovery following the climacteric, the assumption here being that the adrenal cortex, as well as the pituitary, undergoes hypertrophy in this phase.—I am, etc.,

London, W.1, May 23. S. L. SIMPSON, M.D., F.R.C.P.

Acute Abdominal Pain after Opium

SIR,—The experiences which have been recorded under the above heading are probably explained by the experiments carried on for several years at the Mayo Clinic on the mode of production of biliary colic, especially by W. L. Butsch, J. M. McGowan, and W. Walters (*Surg. Gynec. Obstet.*, 1936, 63, 451). These experiments have received less attention than they deserve. When a meal is taken the gall-bladder contracts, the sphincter of Oddi relaxes, and the bile runs into the duodenum. The pressure necessary to overcome the

resistance of the sphincter is usually low—about 20 mm. of water. It was found that in normal animals morphine causes contraction of the sphincter. A subcutaneous injection of 1/6 grain of morphine sulphate caused the pressure in the common bile duct in man to rise to 200 to 300 mm., the rise starting in a few minutes and lasting several hours. In those patients who had previously had colic a similar pain occurred, but in others only discomfort; yet it would not be surprising if more severe symptoms were met with in an occasional case. These experiments explain the common clinical observation that biliary colic is often made worse by a small injection of morphine, the drug being ineffective until the dose is so large that its dulling action on the higher centres overrides the increased spasms of the sphincter of Oddi and the rise of intrabiliary pressure which is the origin of the pain. Atropine causes relaxation of the sphincter normally, but has little or no effect in counteracting the action of morphine. Inhalation of amyl nitrite may produce an instant fall of pressure and relief of symptoms, but the action is temporary. Glyceryl trinitrate grain 1/100 placed under the tongue has a similar action—slower in onset but more lasting. These results have been confirmed by H. Doubilet and R. Colt of New York (*Surg. Gynec. Obstet.*, 1937, 64, 622).—I am, etc.,

London, W.1, May 25. H. LETHEBY TIDY.

Capillary Fragility and Vitamin C

SIR,—The conclusion of Drs. N. U. Khan and M. Minn (May 17, p. 752) that capillary resistance decreases as diet deteriorates is hardly justified on a basis of forty children (even were it shown that the eight children with high petechial counts had persistently high counts before ascorbic acid was given to them). Although some authors consider capillary resistance a dependable test of vitamin C intake, others disagree. Greene (*J. Amer. med. Ass.*, 1934, 103, 4) found that lowered capillary resistance did not necessarily denote low vitamin C intake in children. He found much variation in capillary resistance when the same children were tested at different times. Rapaport *et al.* (*J. Pediat.*, 1940, 16, 624) titrated the vitamin C in the blood plasma of children. They found no correlation between low capillary resistance and hypovitaminosis C.

Positive-pressure capillary resistance tests should be done simultaneously on both arms, as the difference between the number of petechiae on each arm may be large. Subjects with low capillary resistance should be tested repeatedly, and it should be noted that healthy persons on the same diet may show marked differences in capillary resistance (for example, Davis, *Lancet*, 1940, 2, 312).—I am, etc.,

London, S.E.10, May 21. ELI DAVIS.

Laryngitis in Secondary Syphilis

SIR,—In your issue for May 24 (p. 798) there is a letter from Major H. S. Sharp describing a case of "secondary syphilis is one of its rarer manifestations—that is, laryngitis." According to this letter, the "points of interest are: (1) The only complaint was hoarseness; the appearance of the larynx suggested the diagnosis. (2) Mucous patches on the tongue only."

The laryngitis described in this case is most certainly not a rare, but an exceedingly common, manifestation of the secondary phase of syphilis. In my book *Venereal Diseases* (p. 147) is set out a table showing that in a series of 500 consecutive patients of both sexes sore throat and hoarseness occurred in 54 per cent. Where the vocal cords show only hyperaemia and no mucous patches or eroded areas the condition is usually quite painless. The peculiar type of hoarseness is practically pathognomonic. The presence of mucous patches upon the tongue only is not in the least degree uncommon in secondary syphilis. Before the patient reported sick, however, such patches may have been present on other parts of the buccal mucous membrane. Such lesions are often very evanescent—here to-day and gone to-morrow.

From the description of the voice, the larynx, the tongue lesions, and the cervical adenitis, the diagnosis of syphilis was much more than merely suggested, and hardly required—except in the interests of completeness—the discovery of anal condylomata lata, a positive blood serology, and a history of a penile sore.

When I was director of the L.C.C. (Whitechapel) Clinic and lecturer in V.D. at the London Hospital Medical College, I would have been very disappointed in any medical student or postgraduate who regarded the conditions set forth in Major Sharp's letter as being rarities in the acute (secondary) stage of syphilis.—I am, etc.,

Paignton, Devon, May 24. E. T. BURKE.

Loss of Vision following Haemorrhage

SIR,—In his article on loss of vision following haemorrhage (May 24, p. 774) Colonel H. L. Tidy states that only one case of severe loss of vision occurring in pernicious anaemia has been recorded in the literature. This statement appears to be at variance with recent reports of optic atrophy occurring in this disease.

Prof. Henry Cohen has reported cases in which the earliest clinical feature of this disorder was optic atrophy (*Lancet*, 1936, 2, 1202). Similar cases demonstrating the association of pernicious anaemia with optic atrophy have been recorded by Kampmeier and Jones (*Amer. J. med. Sci.*, 1938, 195, 633), and Aldren Turner (*Brain*, 1940, 63, 225). That the visual loss in such cases is not directly attributable to the anaemic state of the blood is shown by its occurrence when the blood count and haemoglobin content are but little altered.—I am, etc.,

London, S.W.6, May 29. L. HARRIS, M.B.

Scabies Epidemic in a Civil Population

SIR,—In the last months of the year 1918 there was an outbreak of scabies in Vienna which spread rapidly. The Ministry for Public Health therefore decided, on the advice of M. Oppenheim, to open a special centre for the treatment of scabies, which was attached to the Department for Skin Diseases of the Wilhelminen-Hospital. The expenses were paid partly by the Government and partly by the panel for workmen. While in the time from 1918 to 1929 27,413 patients were treated, their number fell steadily in proportion to the improvement of the social conditions, especially of the housing accommodation. In 1925 there were 1,031 and in 1930 only 276 patients. After 1931 there followed a sharp rise, and in 1935 (last available figure) 2,539 patients had to be treated. There can be no doubt that that increase was caused by the economic crisis prevailing at that time in Central Europe.

The treatment carried out at the centre was as follows. After the patient had been rubbed with soft soap he got a bath for about half an hour. After the bath the body was dried and rubbed with Hardy's ointment (pot. carbonate 1 drachm, sublimed sulphur 2 drachms, petroleum jelly 1½ oz.). The patient was covered with blankets and had to stay for two hours in a warm room. The treatment ended with a bath and the application of Lassar's zinc paste. The whole treatment lasted for about four hours, and therefore it was possible to work in two or even in three shifts a day.

The excellent results obtained with the work of the centre seemed to depend on several factors: Diagnosis and treatment were concentrated at one place, where a trained staff was available. It might be pointed out that the diagnosis of scabies can be very difficult sometimes—for example, early scabies of people who live hygienically, cases masked by a dermatitis or an eczema following improper treatment, and, especially among children, cases with secondary infection. No patient was admitted to treatment until all members of his family or all persons living with him had been examined. Cases in which the diagnosis was doubtful were treated. After diagnosis each patient was given a leaflet embodying the necessary information—namely, to bring a change of underwear to the treatment centre and to disinfest, by boiling, his bedding and underwear after coming home from the treatment. Patients who seemed to be unsuited to the treatment at the centre because the scabies was too far advanced or they had a dermatitis, etc., and all children under the age of 10 were taken into the hospital and treated, according to age and clinical signs, with Wilkinson's ointment or with sulphur ointment. This treatment lasted from three to seven days. Infants were taken in with their mothers. One of the principal rules was to treat the whole family at the same time.

The treatment used at the Vienna scabies centre compared with modern cures (rotenone, benzyl benzoate) had the disadvantage that it could not be done at home and that it

took a few hours' time. Working men had usually to take a day off. Its advantages were that only one treatment was necessary and that the drugs used were cheap and easily obtainable. Provided the cases were carefully selected the number of recurrences was small.

There were many reinfections, caused chiefly by the fact that not all members of the family were brought for examination or that the directions about disinfestation of bedding, etc., were not obeyed. A close co-operation with a social welfare centre would be of the greatest value to overcome these difficulties. It ought to be especially stressed that group examination and group treatment, disinfestation, and improvement of housing conditions are the most important factors in dealing with a scabies epidemic. The mere treatment of single cases, however effective the treatment might be, will never be sufficient to extinguish the epidemic. Simultaneously with the scabies epidemic among men there was a scabies epidemic among animals, first among horses. There were many cases of scabies among cats, goats, etc. From grazing goats scabies was transmitted to chamois and did considerable damage among game in some districts of the Alps. The animal scabies was interesting; even as late as 1930 people were infected with scabies from their pet cats. The signs of scabies transmitted from animal to men are different from the ordinary scabies and the diagnosis is often difficult. Reinfection occurs till the source—for example, the infected cat—is treated too.—I am, etc.,

Belfast, May 8. A. FESSLER.

Physical Medicine, Orthopaedics, and the Services

SIR,—The controversial views which pervade both your annotation of April 26 (p. 633) and the letters in the correspondence columns criticizing this make it clear that all is not well with the status of physical medicine. In its present form it appears to be no more satisfactory to the physiotherapists than acceptable to his colleagues—the orthopaedist in particular. That this should be so could not possibly come as a surprise to anyone who has watched the trend of events over a period of years. The truth is that the physiotherapist of to-day occupies an untenable position inasmuch as he desires to rank as a universal clinician specialized in a particular group of therapeutic measures. Such a combination invites suspicion and must result in his extinction.

From the letters signed by some orthopaedic surgeons (May 24, p. 791) it is obvious that physiotherapy is looked upon by them as their own rightful "sphere of influence." Such a conception also has objectionable features, for it would lead to a monopoly which might create an anomalous situation such as a gynaecologist having to refer cases requiring intrapelvic diathermy to the orthopaedic department for this type of treatment.

The only other alternative is one where the medical man whose main interest is in the development of physical methods assumes a position somewhat similar to that of the pharmacologist, his programme being the application of physical principles to the diagnosis and treatment of pathological conditions. This, of course, implies investigation of the action of physical agents and the elaboration of technique and posology. For such an ambitious scheme to be successful a number of conditions would have to be satisfied. The physiotherapists, who incidentally should have made a thorough study of physics and mechanics, would have to be in charge of physiotherapy departments in hospitals so as to have access to the clinical material essential to the advancement of this science. At the same time some degree of decentralization should obtain as regards the treatments which have been accepted as valuable, for which the indications are clear-cut, and of which the technique and posology have been established. The importance of close and continued collaboration between the physiotherapist and his colleagues cannot be sufficiently stressed, since without this a wholesome critical element of the patient's progress would be wanting.

It is not possible in a letter of this type to embrace every facet of what must be considered a revolutionary idea, but I feel that such a change would be for the better and would put an end to strife, which must otherwise continue on account of the insoluble nature of the problem.—I am, etc.,

London, W.1, May 26. P. BAUWENS.

SIR,—The recent correspondence in your columns discusses and criticizes the work and status of physical medicine. Some orthopaedic surgeons and others claim that physical medicine should be ancillary to the field of orthopaedic surgery and should be controlled by them with the help of technicians or similar personnel.

It must be recorded that the apparatus and agents employed in physical medicine have biological or physiological actions which include: (1) the counteraction of shock; (2) analgesia and relief of pain; (3) the production of heat, including fever —that is, artificial pyrexia; (4) augmentation of the capillary circulation—counter-irritation; (5) stimulation of metabolism, vitamins, and cell growth; (6) bactericidal effects and surface sterilization; (7) the increase of local and general immunity, prophylactic measures (preventive medicine); (8) the excitation of movement, massage, physical exercise, manipulation, rehabilitation, etc.; (9) psychological effects. These reactions can only be successfully obtained by the training and employment of skilled physicians, who have obtained specialized knowledge of the most suitable apparatus or agent necessary, of the method of application of that apparatus or agent, and of the dosage to be administered by the qualified personnel under their supervision.

Only 10% of the work of physical medicine falls within the scope of the orthopaedic surgeon; about 35% is devoted to the treatment of rheumatic diseases and arthritis, etc.; the remainder is equally divided between the dermatologist, the gynaecologist, the neurologist, and others. It is impossible to conceive the true position of physical medicine as one which is ancillary to orthopaedic surgery alone. In support of Sir Morton Smart's remarks (May 24, p. 792), the position of the orthopaedic surgeon is little different from that of the neurologist, the ophthalmic surgeon, or other specialized department which needs to employ physical medicine. The ideal method must be co-operation between the physiotherapeutist and the personnel under his supervision. The system by which the general practitioner, physician, or surgeon refers his cases to the department of physiotherapy (usually accompanied by inadequate prescription) must have serious deficiencies. In practice the treatment is left to the discretion of the technician or personnel attached to this department. With the best will in the world they cannot give full justice to the patient or obtain the results to be expected from the help and advice of the specialist. The fallacy of such methods is seen in the administration of prophylactic treatment to industrial workers in factories. The general adoption of such policy must finally lead to the complete disappearance of the specialist in physical medicine, since he cannot survive without the recognition of his special knowledge or without support from his colleagues.

In my own opinion manipulative treatment should be carried out solely by orthopaedic surgeons; after-treatment may need the correct co-operation between the orthopaedic surgeon and the physiotherapist.

The present position of physical medicine is unhappy and does not encourage special training or specialization. The department of physical medicine usually treats a high percentage of the total number of patients who attend the outpatient department, but often it has no working specialist. Too much is left to the discretion of the technician, and as a result treatment is often inadequate, disappointing, or unduly delayed. It is practically impossible for the consultant in physical medicine to give his service to more than one or two hospital departments. His work calls for regular attendance in the department for many hours so that he can supervise the treatment carried out by the personnel; it is frequently necessary for him to carry out the treatment himself. Full collaboration with his colleagues is essential, and in special cases the combined effort is needed—for example, in conditions affecting the larynx or the eye, and in gynaecological cases. I hope that in the near future all departments of physical medicine will be directed by an actively working consultant specialist, who will devote regular and adequate time to his duties; in addition, the teaching of nurses and training of students and doctors must be organized. I cannot see any future for specialization or the successful organization of the work of physical medicine unless such plan and programme are rapidly supported.—I am, etc.,

London, W.1, May 26. ALBERT EIDINOW.

Medical Planning Commission

SIR,—I have noticed, with some little regret criticism of the Medical Planning Commission. This commission does represent all that is best in our profession, and we should be grateful to its members for giving up so much of their time to work from which they can derive no possible personal benefit. Much has been said and much written lately on the establishment of a State Medical Service, but whether or not such a service shall be established is for Parliament and not for us to decide. All that we can do is to attempt to safeguard the advancement of medicine and the interests of our patients and protect our own professional life. We have learned during recent months from bitter experience what dire results panic legislation can have, and it is undoubtedly in the national interest that the future of medicine shall be discussed now so that we may not be caught unprepared in a difficult post-war period. It is to be hoped that the Medical Planning Commission and the medical profession generally will see the terrible dangers of the deification of the State—this dread paganism which is overrunning the world, a paganism more dangerous and more evil than any previously known in the world's history, a paganism which is demanding for its god—the State—human sacrifice on a scale hitherto undreamed of.

Much of the influence exercised by the Church has passed away, but medical practitioners individually and collectively still do exercise some influence on public opinion, and the Medical Planning Commission will have to face and consider great sociological problems affecting the lives of millions.

It is the plain duty of all who wish to see a better world for the next generation to give their utmost support and assistance to this commission.—I am, etc.,

JOHN ELIOT

New Barnet, May 25.

Obituary

DUGALD REVIE, M.B., C.M., D.P.H.

The death occurred at Dumfries on May 13 of Dr. Dugald Revie, who had been for many years a well-known figure in Newcastle-upon-Tyne and Northumberland B.M.A. circles.

Born in Glasgow (writes "W. S.," a pupil and admirer) as long ago as 1862, Dr. Dugald Revie was until quite recently the moving spirit of the Morpeth Division of the B.M.A., and engaged in active general practice until a few weeks ago. He received his early education at the George Square Academy, Glasgow, and went on to Glasgow University, where he graduated M.B., C.M. in 1889. In the same year, after a theological course, he was ordained a minister of the United Free Church of Scotland, and sent to India as a medical missionary. He spent twenty very fruitful years (1889-1909) at Wardha, Central Provinces, doing a great work during the plague which ravaged those districts in 1898. For this he received Government recognition, as also for the devoted work he did for the leper asylum at Wardha during the years 1894-1909. Dr. Revie entered into the municipal life of his district (as well as being guide, philosopher, and friend to the people in his capacity as missionary) by serving as vice-chairman of Wardha Municipality 1891-1900, and chairman 1900-4.

After twenty years' service in India Dr. Revie retired to the homeland on account of his wife's health, and began a second long and useful career in this country. He practised at Blairgowrie in Perthshire for about three years, taking in 1912 the St. Andrews D.P.H. and becoming M.O.H. of the neighbouring district of Rattray with the control of Strathmore Hospital 1910-13. Dr. Revie bought a practice at Ashington, Northumberland, in 1913, and gave his services in a voluntary capacity, as captain in a Northumberland Field Ambulance to the R.A.M.C., acting also as a surgeon attached to Ashington Hospital during the last war. He quickly identified himself with medical and medico-political activities on the Northumberland coalfield, and soon became a force in North-Eastern B.M.A. circles, being instrumental in carrying out agreements between the doctors and the miners' lodges on various occasions. It was largely due to Dr. Revie's influence that the Ashington Public Medical Service was founded in 1927. Of this very successful venture he was honorary secretary until his death. He served the Morpeth Division of the B.M.A. in many capacities from 1914 to the present time, being hon. secretary from 1931 to 1938, when he retired on account of failing health. He acted as delegate at several Representative Meetings of the B.M.A., his advice being often asked on medico-political and medico-ethical subjects by doctors in Newcastle-upon-Tyne and Northumberland. He was also a member of the Northumberland Panel Committee and an authority on N.H.I. matters. His last public service was as hon. secretary of the Morpeth (Northumberland) Local War Committee, which post he held from 1938 until his death. In addition to being universally beloved as a family physician in his adopted district, Dr. Revie was well known and respected in Church circles, especially amongst North of England and Scottish Presbyterians. He had the unique distinction of holding a seat in both English and Scottish Presbyterian Assemblies. He used to recall as one of his pleasantest memories his taking part in the historic march through Edinburgh at the time of the Union of the United Free Church with the Established Church of Scotland in 1929.

JOHN W. C. GUNN, M.A., M.B.

Professor of Pharmacology, University of Capetown

We regret to announce the death on May 4 of Dr. John William Cormack Gunn, professor of pharmacology and dean of the faculty of medicine in the University of Capetown. During his early years in South Africa he had been honorary secretary of Cape of Good Hope West Branch of the British Medical Association, and at the Centenary Meeting in London in 1932 he was vice-president of the Section of Pharmacology and Therapeutics.

John Gunn, like his elder brother Prof. J. A. Gunn, M.D., of Oxford, was a native of Kirkwall, Orkney, where he was born on January 29, 1889. From Kirkwall Burgh School he went to the University of Edinburgh and distinguished himself as a student, winning the Neil Arnott Prize on graduation as M.A. in 1908. He took the M.B. and Ch.B. degrees in 1912, and after some months as assistant in materia medica in the University laboratory at Edinburgh was appointed assistant in the Department of Pharmacology at University College, London. He held that post for six years and then went to Belfast as lecturer in pharmacology at Queen's University, and taught there until his election in 1919 to the chair of pharmacology at Capetown. During the last war he served in Egypt as officer in charge of the Medical Division of the 19th General Hospital at Alexandria with the temporary rank of major R.A.M.C., and was mentioned in dispatches.

Besides his work as professor of pharmacology and dean of the faculty of medicine at Capetown Prof. John Gunn undertook the duties of curator of the Wernher and Beit medical laboratories and head of the Medical Students' Residence. He published several papers on pharmacological subjects in the *Journal of Pharmacology* and the *Transactions of the Royal Society of South Africa*.

H. O. NICHOLSON, M.D. Aberd., F.R.C.P.Ed.

Past President, Edinburgh Obstetrical Society

Dr. Harry Oliphant Nicholson died at a nursing home in Edinburgh on May 26. The second son of Prof. H. Alleyne Nicholson, M.D., D.Sc., who held the chair of natural history in the University of Aberdeen, he was born on March 13, 1870, and from Gordon's College went to study medicine at his father's university, where he graduated M.B., C.M. in 1891, and was awarded highest honours and the Strathcona Prize for his M.D. thesis some years later. His early clinical experience was gained as house-physician and house-surgeon at the Royal Hospital for Sick Children, Aberdeen. This was followed by post-graduate obstetrical work in Berlin. He then practised for eight years at Kirkcaldy, moving at the end of the century to Edinburgh, where he spent the rest of his life.

Dr. Oliphant Nicholson was made a Fellow of the Royal College of Physicians of Edinburgh in 1904, by which time he had been appointed to the staff of a number of medical institutions. For twenty years he worked as senior assistant physician to the Royal Maternity Hospital, retiring in 1924. He was also lecturer on clinical obstetrics in the University of Edinburgh, and examiner in midwifery at his own university and for the Scottish Midwives Board. Dr. Nicholson was a

popular teacher, with a gift for imparting the practical side of his subject. Throughout his working life he combined general practice with the specialties of midwifery and gynaecology. As a colleague has written in the *Scotsman*: "He represented the type of practitioner who in some ways is characteristic of one of the most attractive aspects of Scottish medicine—the family doctor who plays a multitude of parts." He was a kind and generous man, devoted to his patients, and in turn they looked upon him as their friend. He had been a member of the British Medical Association for nearly fifty years.

SIR D'ARCY POWER

Dr. J. D. ROLLESTON writes:

The excellent survey of Sir D'Arcy Power's life and work in the *Journal* of May 31 (p. 836) contains one slight error and two omissions. The International Congress held in London in 1913 was an International Congress of Medicine and not an International Historical Congress as stated by the writer of the obituary, though its Section XXIII, to which Sir D'Arcy contributed a paper on the lesser writings of John Arderne, was devoted to the history of medicine. The International Congress of the History of Medicine held in London, of which Sir D'Arcy was vice-president of honour and I was general secretary, did not take place until 1921. The omissions, which are not unimportant, as they are concerned with Sir D'Arcy's interest in public health, are as follows. First, there is no mention of his having been a nominee of the Ministry of Health on the Metropolitan Asylums Board from 1921 to 1927, during which period he served as chairman of the Pinewood Sanatorium, Medical and Nursing Subcommittee, and member of the Tuberculosis Subcommittee, Infectious Hospitals Committee, and North-Western Hospitals Subcommittee. Secondly, some mention should surely have been made of his interest in venereal disease, on which he gave evidence before a Royal Commission as representative of the Royal College of Surgeons and the Royal Society of Medicine in 1914, and contributed many articles to periodical literature, as well as being co-editor with J. Keogh Murphy of a *System of Syphilis*.

We regret to announce the death by enemy action of Dr. R. EDMUND SYMES-THOMPSON at the early age of 28. The son of Dr. H. E. Symes-Thompson, consulting physician to the Royal Chest Hospital, and grandson of the late Edmund Symes-Thompson, M.D., F.R.C.P., Richard Edmund studied medicine at Cambridge and at St. George's Hospital, graduating B.A. in 1934 and taking the M.R.C.S. and L.R.C.P. diplomas last year. At St. George's he won the Sir Charles Clarke prize and the Thompson medal, and since qualification he had been resident anaesthetist there and house-physician at St. Luke's Hospital, Chelsea.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The Committee for Medical Radiology and Electrology has fixed dates for the D.M.R. and E. examinations in 1942 as follows: Part I, February 10 and July 8; Part II, July 7 and October 6.

At a Congregation held on May 24 the following medical degrees were conferred:

M.B., B.CHIR.—(By proxy) I. B. Mackay, A. R. P. Ellis.

UNIVERSITY OF EDINBURGH

The University Court has approved the following recommendations of the Faculty of Medicine:

(1) That psychiatry be added as a subject in the final professional examination in medicine in the fourth year: a written paper and an oral examination, conducted by the professor and lecturer, with an external examiner.

(2) That candidates for the Diploma in Medical Radiology be required to have had at least two years' postgraduate experience: six months as resident surgeon in a hospital and eighteen months' general clinical experience; and that it is desirable that they should have had postgraduate experience in morbid anatomy and morbid histology.

The Services

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Surgeon Lieut. IVOR MCNEIL DRYSDALE, R.N., was killed on active service in March. He was the youngest son of the late Mr. Drysdale and Mrs. Drysdale of Glasgow, was educated at the University of Glasgow, where he graduated M.B., B.Ch. in 1935, and entered the Royal Navy in 1936. He leaves a widow.

Surgeon Lieut. JAMES OXENHAM FIELDING, R.N., was killed when H.M.S. *Hood* was sunk last month. He was the only son of Dr. and Mrs. S. J. Fielding of Norwich, and was educated at Queens' College, Cambridge, and St. Thomas's Hospital, qualifying M.R.C.S., L.R.C.P. in 1938. He had held the posts of clinical assistant in the ophthalmic, psychological medicine, and ear, nose, and throat departments, and senior ophthalmic house-surgeon, at St. Thomas's Hospital before entering the Royal Navy in 1938. He leaves a widow. He was a member of the British Medical Association.

Wounded

Temporary Surgeon Lieut. Alexander Watt, R.N.V.R.

ROYAL ARMY MEDICAL CORPS

The death is reported on active service in the Middle East in May of Captain DONALD STARR. He was the only son of Mr. and Mrs. J. Starr of Wigan and graduated M.B., Ch.B. of the University of Manchester in 1926. He had held the posts of house-surgeon at the Manchester Royal Infirmary and medical officer at the Kent County Mental Hospital, Chartham Down. He leaves a widow. He joined the British Medical Association in 1928.

Lieut. ALASTAIR HAIR died in April of wounds received in action. He was the elder son of the Rev. James and Mrs. Hair of Edinburgh, and was educated at the University of Glasgow, where he graduated M.B., Ch.B. in 1931. He resided in Edinburgh for a time after graduation and then moved to Presteigne in Radnorshire until 1935, when he was appointed medical officer of health for Llandrindod Wells.

Medical Notes in Parliament

Diphtheria Immunization

In a reply on May 29 to Prof. Hill, Mr. BROWN said it was estimated that if three-quarters of the number of children at each year of age below 15 were immune against diphtheria and this level were maintained year by year the disease would be practically abolished. It would be premature to forecast the result of the steps now being taken to promote immunization. He trusted the good sense of parents would in the great majority of cases lead them to secure for their children this vital protection.

Answering Mr. Leach on the same date, Mr. BROWN said the number of deaths from diphtheria in the 126 great towns during the first quarter of 1941 was greater than in the corresponding periods of 1939 and 1940. The number of notifications in the same period was greater than in the first quarter of 1940, but less than in the first quarter of 1939. He had no figures, as yet, to show the increase in the number of children immunized during the first three months of 1941. This could not be related to the total of deaths from diphtheria in persons of all ages. Nor could the effects of the disease over a short period be related to the number of inoculations carried out in that same period, immunization being essentially a prospective and long-term safeguard. He was not aware of any facts which suggested that immunization caused outbreaks of diphtheria, but there was ample evidence that in places where it had been widely applied to children under 15 the disease had been practically eliminated.

Hospital Physiotherapy Departments

General Sir GEORGE JEFFREYS asserted that there were hospitals staffed with one or more masseuses acting under the direction of surgeons who had no specialized training in this branch of medicine, and that physiotherapists were appointed to the staffs of hospitals only in the event of an application being made for such an appointment by the medical superintendent of the hospital. He asked Mr. Brown to direct that physiotherapists be appointed whether the medical super-

intendent applied or not. Mr. BROWN said on May 28 that the policy of advocating the provision of physiotherapeutic departments in all Class I hospitals with 300 or more casualty beds was announced in a circular of June 25, 1940, and in subsequent statements. The existing methods of staffing these departments were generally satisfactory. His department had in a number of cases invited hospital authorities to consider the appointment of physiotherapists. It would not be wise to insist upon such appointments against the wishes of the clinical staff of the hospital. No alien physiotherapist had yet been appointed to a post under the Ministry.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

With the exception of measles, the incidence of all the common infectious diseases decreased during the week. The notifications of measles, which fell by nearly 3,000 in the previous week, rose by 989. The increase was fairly general throughout the country, the returns from Buckinghamshire, Herefordshire London, and Sussex being the highest of recent weeks. In Scotland the notifications were less than half those for the preceding week, which had been exceptionally high Edinburgh is the only area which did not report a decrease

Whooping-cough

The notifications of whooping-cough for the counties of England and Wales showed only minor fluctuations from the totals returned for the preceding week The relatively large rise in the prevalence of the disease in Buckinghamshire Durham, and Suffolk West was contributed by the rural districts; the increase in Essex was general throughout the county. In Glasgow 403 fresh cases were notified during the week, as compared with 714 in the preceding week

The notifications of scarlet fever in England and Wales declined by 47 and by 43 in Scotland Approximately one-seventh of the total cases were recorded in Lancaster

Diphtheria

The fall in the northern region, and Wales was responsible for the decrease of 73 in the notifications of diphtheria; the tendency was to an increased incidence in other parts of the country. The lowest figure—171—of recent months was recorded in Scotland. The intensive drive by the Ministry of Health for immunization against diphtheria has been well supported by local medical officers, and their reports show that a large number of children have already been treated

Enteric Fever

Forty-one cases of enteric fever were notified in England and Wales, a reduction of 9 compared with the preceding week From the scattered outbreak in Middlesex 17 fresh cases were recorded, an increase of 4. The next largest total was received from Lancaster, 7, an increase of 5 cases The total of 40 cases reported from Scotland was 9 below that of the previous week. Dundee, with 27 cases, is still the principal centre of the disease.

Dysentery

The incidence of dysentery declined by one-third in England and Wales during the week reviewed. A further 8 cases were notified in Lancaster, Whiston R.D., and in the two London outbreaks 7 new cases occurred in Islington and 10 in Wandsworth. A decrease of 8 was recorded in notifications from Scotland, but in the city of Aberdeen the figure rose from 7 to 12.

Cerebrospinal Fever

The number of new cases of cerebrospinal fever notified in England and Wales during the week was 266, a decrease of 61 on the total of the preceding week, and was the lowest weekly total since the second week in January. Small increases were reported in some areas; the highest of these was 6 and was recorded for Cheshire and Devonshire. In London there were only 16 notifications, as compared with 37 in the preceding week. In Scotland 65 cases were notified during the week, an increase of 28 compared with the preceding week. The largest returns were from Glasgow, 20; Edinburgh, 9; and the County of Ayr, 8; the remaining 28 were from twenty-two areas.

Typhus Fever

An outbreak of typhus fever was reported as occurring on May 17 in the Clogher district of West Clare One death has occurred.

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 10.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland

A dash — denotes no cases, a blank space denotes disease not notifiable or no return available

Disease	1941 (a)	(b)	(c)	(d)	(e)	1941 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever Deaths	266	16 4	65 3	3	24	313	29 1	73 3	1	15
Diphtheria Deaths	858 20	45 2	171 5	41 1	22	657 23	24	257 6	45 2	37
Dysentery Deaths	69 6	18 2	32	—	—	33	3	39 2	—	—
Encephalitis lethargica, acute Deaths	3	—	2	—	—	8	—	2 2	1	—
Enteric (typhoid and paratyphoid) fever Deaths	41 2	3 1	40 1	17 1	—	28	1	13	5	1
Erysipelas Deaths	—		50	9	—	—	—	42	8	2
Infective enteritis or diarrhoea under 2 years Deaths	39	5	9	5	2 3	34	11 25	10 508	4	5 121
Measles Deaths	11,993 13	464	66 2	1	—	6,223 2	105	3 29	—	4
Ophthalmia neonatorum Deaths	80	2	24	—	—	79	33	10	3	1
Pneumonia, influenzal* Deaths (from influenza)	1,002 19	52 29	11 3	1	2	25	1	261	8 10	9 16
Pneumonia, primary Deaths		29	235	10 11	5		33			
Polio-encephalitis acute Death		—	—	—	—		—	1	—	—
Poliomyelitis, acute Deaths	6 1	1	—	2	—	6	2 1	12	3	—
Puerperal fever Deaths		1	15	—	—	2	13	25	—	2
Puerperal pyrexia Deaths	119	8	22	—	—	151	—	—	—	—
Relapsing fever Deaths	—	—	—	—	—	—	—	—	—	—
Scarlet fever Deaths	1,012	51	142 1	54	13	829 1	34 1	116	45	43
Small-pox Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever Deaths	—	—	—	—	—	—	—	—	—	—
Whooping-cough Deaths	4,081 27	127	432 17	—	—	601	13	37	2	10 2
Deaths (0-1 year) Infant mortality rate (per 1,000 live births)	377	29	91	27	15	342	48	95	23	23
Deaths (excluding still-births) Annual death rate (per 1,000 persons living)	5,705	648	710 15.5	216 14.3	229 20.1	4,614	731 13.0	703 13.6	203 15.7	179
Live births Annual rate per 1,000 persons living	4,983	433	878 17.9	335 22.2	181 15.9	7,172	1,109 20.4	1008 27.6	414 24.3	277
Stillbirths Rate per 1,000 total births (including stillborn)	203	14	40 44			275	38	45 43		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Medical News

Mr. F. C. R. Douglas, M.A., M.P., Chairman of the Housing Committee of the L.C.C., will read a paper on "Economic Aspects of Soil Fertility and Nutrition" before the Royal Society of Arts on Wednesday, June 11, at 2.30 p.m., at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.

A meeting of the Section of Proctology of the Royal Society of Medicine will be held on Wednesday, June 11, at 5 p.m., for a discussion on "Factors which make for Safety in the Pre-operative and Post-operative Treatment of Carcinoma of the Rectum," to be opened by Prof. E. R. Flint, Surgeon Rear-Admiral G. Gordon-Taylor, Dr. Cuthbert Dukes, and Mr. C. Naunton Morgan.

The B.B.C. announces that on Friday, June 13, at 10.15 p.m., "Blitz Doctors," a programme of incidents in the life of the Emergency Medical Services in wartime, will be heard in the Home Service. This is based on material collected by a doctor. The programme, divided into four parts, tells the story of the "doctors of the blitz" (medical men, nurses, ambulance drivers, stretcher-bearers) from their inception through the earlier war days, through the arduous waiting period right down to the moment when they went into action. The programme has been prepared in consultation with medical personnel who have been in the blitz since it started.

A meeting of the Bristol Division of the B.M.A. will be held in the Physics Lecture Theatre at the Royal Fort, University of Bristol, on Thursday, June 12, at 3.30 p.m. All members of the Association and medical non-members will be welcome. A symposium has been arranged on "Experiences of First Aid in Air Raids." Dr. J. N. Nixon, chairman of the Division, will preside, and Dr. H. M. Golding will open the discussion, followed by Prof. R. H. Parry, M.O.H. Bristol, and eight other medical men. Tea will be served after the meeting. Those intending to stay for tea should inform the hon. secretary, Dr. J. A. Hooker, before June 10.

Dr. I. Frost has been appointed medical secretary to the British Social Hygiene Council—the position recently vacated by Sir Drummond Shiels, who is now devoting his whole time to his work on the Empire Parliamentary Association, but remains the Council's medical adviser.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Post-herpetic Neuralgia

"M.B., B.S." writes: I am at present attending an elderly gentleman who is suffering from severe post-herpetic neuralgia following an attack of herpes zoster affecting his cervical plexus. I shall be grateful for hints regarding any treatment which is likely to relieve his pain. The worst of the pain actually seems to have passed off, but the relatives are anxious that something further should be done. Would any of the forms of physiotherapy or electrotherapeutics be of any use in these cases?

Treatment of Night Sweats

"J. R. E." writes: Has "J. N. T." (March 8, p. 389) considered the possibility of undulant fever?

Income Tax

Cost of Board and Lodging of Assistant

"P" claims to deduct £2 per week in respect of a locumtenent, but the inspector of taxes considers £1 per week to be sufficient. Has he a good case for appeal to Commissioners?

* * So much depends on the precise facts of each case that * it is difficult to advise. Certainly £1 a week seems a low estimate to cover not only cost of food but also the locumtenent's share of domestic service, rent and rates, light and heat, etc. We think "P" may have a good chance of increasing the £1 per week on appeal, though the Commissioners might not go so far as to allow £2 per week. If there are no special circumstances we should advise an appeal unless the Inspector is prepared to compromise at, say, 30s. or 35s. per week.

LETTERS, NOTES, ETC.

Evening Temperatures and "Midsummer Time"

Dr. W. H. PALMER (Hayle, Cornwall) suggests that the present two hours' difference between clock-time and sun-time may be leading to many errors where the old times of taking evening temperatures are adhered to. He writes: A preliminary test of this theory, in both private and hospital practice, has shown that quite a proportion of cases have not actually reached the end of their febrile stage, though the charts (kept at clock-time) indicate that they have. In some cases—for example, operation for appendicitis and peritonitis, mucopurulent bronchitis in elderly patients—there was as much as two degrees' difference between the 6.30 and 8.30 evening temperatures, and it is just in these cases that getting up too soon may have unfortunate results. Not having seen or heard this subject referred to as yet, I am drawing attention to it in case others would like to make some comparative tests for themselves.

Opalescence of the C.S.F. after Sulphapyridine

Dr. W. LEES TEMPLETON (London, N.6) writes: Some time ago I reported a peculiar opalescence of the cerebrospinal fluid in cases of pneumococcal meningitis during the administration of sulphapyridine. In each case nothing abnormal was then present in the fluid, but the appearance on naked-eye examination was disconcerting when seen for the first time. Drs. D. F. Johnstone and P. Forgacs (May 24, p. 772) describe the same appearance. One wonders if the pathologists have any explanation for this phenomenon and if it is present in any other condition. Incidentally, with reference to the article mentioned in which cerebral symptoms are, it is suggested, produced by the drug, might I be allowed to point out that, if it is so, then it would seem to support the view that in meningitis sulphapyridine may act by virtue of its homoeopathicity—in other words, that the drug which can produce symptoms may in smaller doses cure the same condition.

Hips and Vitamin C

Mr. A. V. WADSWORTH writes: Quite an interesting correspondence has been taking place on the above subject. No one seems to have gone into the question of the true vitamin C content of rose-hips confection. Last year I made from the hips of *Rosa rugosa* a confection by the following method. The ripe hips were boiled with a little water and strained through a sieve, an equal quantity of sugar was added, and the whole boiled until it formed a jelly on cooling. This made a very pleasant confection. The vitamin C content of the pulp of the original rose-hips was equivalent to 777 mg. of ascorbic acid per 100 grammes, and that of the final conserve was equivalent to 378 mg. of ascorbic acid per 100 grammes. These figures are far in advance of the vitamin content of the much-vaunted orange, and there is no doubt that as a source of vitamin C rose-hips cannot be ignored. The pulp of the very large hips of the *Rosa rugosa* can be eaten when ripe; it has a pleasant flavour of tomatoes. Two of these are practically equal to an orange.

Lobar Pneumonia at 100: Recovery

DR. C. E. H. MILNER (Reigate) writes: A spry and voluble old Dublin lady of a hundred summers (who says she has had two attacks of pneumonia in the past) had a rigor six days ago, and was found to have a temperature of 102.4° F. Pulse and respiration were not unduly hurried—92 and 24. Marked dullness was discovered at the left base, and the diagnosis of lobar pneumonia was obvious. The only treatment was by sulphapyridine, 1 gramme four-hourly, together with 2 drachms four-hourly of John Jamieson's best. The result was dramatic. The temperature fell, step by step, during twenty-four hours to the normal line; pulse and respiration also. Physical signs only now became elicited by auscultation, and the whole of the left lower lobe was found to be consolidated. Recovery in six days is complete, and the patient's appetite is voracious.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY JUNE 7 1941

General Council of Medical Education and Registration

PRESIDENT'S ADDRESS

In his opening address to the one hundred and fifty-third session of the General Medical Council, which met at the house of the Royal Institute of British Architects on May 27, Mr. T. L. EASON, the president, referred to the damage to the Council's premises through enemy action. The material loss, he said, was much less than might have been expected in the circumstances. The Royal Institute of British Architects had extended their hospitality not only to the Council but also to the officers of the Council and of the Dental Board. Moreover, they had found room for the material without which the business of both bodies as registration authorities could not be carried on for a day.

It would be the pleasure of the Council that he should convey to Sir Ian MacAlister, the secretary of the Royal Institute, and through him to his colleagues, a warm expression of the Council's appreciation of all that he and they had done at a critical moment.

Personal Matters

Mr. Eason continued:

Since we met in November Prof. Robert Howden who represented the University of Durham on the Council from 1918 to 1928, has died. When he first took his seat among us he was welcomed by the President as "the accomplished editor of Gray's *Anatomy*," and the minutes show that when he retired from our ranks ten years later he had become a familiar friend and had been a loyal helper in our business.

I am sure that all the members of the Council will hear with the deepest regret that, owing to grave illness, Sir Norman Walker has found it necessary to resign his seat on the Council. When he retired from the presidency in November, 1939, I expressed the hope that we might have his advice and counsel for many years to come. That hope has not been fulfilled, and we shall all regret that Sir Norman's long and distinguished services to the Council have now so sadly come to an end. Sir Norman Walker sat on this Council as a direct representative of the registered medical practitioners of Scotland, and by the provisions of the General Medical Council (Temporary Provisions) Orders, 1940, any vacancy in the office of a direct representative is to be filled by the election, as soon as conveniently may be, of a successor by the Council. It will be our duty, therefore, at a later stage in this session, to elect a direct representative to fill the vacancy caused by Sir Norman Walker's resignation. The person so elected will hold office until December 31, 1941.

His Majesty, with the advice of his Privy Council, has been pleased to nominate Professor Lowry to take the place of the late Colonel Thomas Sinclair. This translation of a colleague and friend from the representation of the Queen's University, Belfast, to the position of Crown nominee for Ireland involves the appointment of a new representative of the University.

Supply of Students and Practitioners

The Council will note with satisfaction that in the Schedule of Reserved Occupations as revised in April it is provided that all persons who have been admitted, or duly accepted for admission, as students by recognized medical schools shall be reserved. It is, however, a condition of their reservation that, except in the clinical years, they shall join a Senior Officer Training Corps or an Air Training Squadron, or undertake some alternative form of national service approved by the university authorities, and that their reservation is subject to periodical certification of satisfactory progress in their studies. Medical schools are also to undertake not to admit, in ordinary circumstances, a quota of students higher than the average entry for the three years preceding the war. It will be possible, therefore, to maintain the supply of medical practitioners at its normal level. Meanwhile the Medical Register for 1941 shows that there were 1,319 more registered medical practitioners at the end of 1940 than there were at the end of 1939. The number of persons added by registration to the Register was 584 less in 1940 than in 1939, but this reduction was primarily due to a fall of 410 in the number of registrations in the Colonial and Foreign Lists.

With the object of using to the best advantage the professional services of volunteers from the Empire outside the United Kingdom, or from Allied or friendly countries, and of friendly refugees from enemy countries, a new Order in Council—the Medical Register (Temporary Registration) Order, 1941—has been made since the last meeting of this Council. Under Defence Regulation 32B and this Order the Council may register temporarily in the Colonial or Foreign Lists of the Register practitioners from the following territories: (i) The several States and territories of the Commonwealth of Australia, Burma, the several Provinces of the Dominion of Canada (to which the Order of 1940 also applied), India, Newfoundland, New Zealand, and the several Provinces and territories of the Union of South Africa; (ii) His Majesty's Colonies, Protectorates, and Mandated Territories; (iii) Belgium, Czecho-Slovakia, France, Greece, Holland, Norway, and Poland; and (iv) Germany and Italy.

The President then reminded the Council of the prescribed conditions for registration under this Order.

The numbers of practitioners who had at the end of last week been registered by virtue of Imperial qualifications granted outside the United Kingdom was 44, and by virtue of qualifications granted in the United States of America or in Continental countries 250, of whom 20 were serving in the Armed Forces, and 230 were in civil employment approved under the Order of 1941. More recently Mr. Roosevelt, in response to a telegram sent to the American Red Cross, of which he is president, has appealed for 1,000 young American doctors to volunteer for professional service either in the Armed Forces of the Crown or in the civilian Emergency Medical Service, an appeal to which there has already been a splendid response.

Another instance of the sympathy of the United States with the difficulties which may beset medical students in schools which have been damaged in air raids is the offer of the Rockefeller Foundation to provide a two-years course of clinical instruction free of cost in medical schools of repute in the United States or Canada for twenty-five selected candidates. This offer has been gratefully accepted, and a committee presided over by the Chairman of Business will shortly be making the necessary selection from among the applicants. A number of licensing bodies have already agreed that the studies which they pursue during their two years' absence will be recognized here as part of the curriculum. The Council has intimated that it will raise no difficulty to this.

Medical Reciprocity

The severance in October of the reciprocal relations between the United Kingdom and Italy has set us free to make it known that the view of the law on which an important provision of the Anglo-Italian agreement of 1925 as to professional practice in the two countries was founded has since proved to be mistaken. The view which in 1925 had prevailed since 1886 was that every practitioner whose name was in the Medical Register was a registered medical practitioner of the United Kingdom. The later, and the authoritative, view is that only practitioners registered by virtue of qualifications granted in the United Kingdom or in Eire are registered medical practitioners of the United Kingdom. That is to say practitioners registered in the separate lists of Colonial and foreign practitioners in the Register in pursuance of Section 14 of the Act are not registered medical practitioners of the United Kingdom, and no territory is required to afford privileges of practising to Colonial or to foreign practitioners as a condition of the establishment or maintenance of reciprocal relations between that territory and the United Kingdom.

Certificates by Practitioners

It has recently been made to appear to me by informati and evidence received from competent authorities that i

number of instances there has been a relaxation of the vigilance with which certificates are being signed. I have therefore, after consultation with the Penal Cases Committee, issued, on behalf of the Council, an announcement in the medical press drawing attention of registered medical practitioners to the terms of the Warning Notice issued by the Council with regard to the granting of medical certificates. (See *British Medical Journal*, April 19, 1941, p. 600.)

EDUCATIONAL BUSINESS

Colonel H. L. TIDY, chairman of the Education Committee, stated that a complaint had been received, through the Secondary Schools Examination Council, from the Joint Committee of the Associations of Headmasters and Assistant Masters and Headmistresses and Assistant Mistresses, concerning the action of certain medical schools in allowing only a limited number of students who had obtained exemption from the first medical examination on the result of the higher school certificate to enter second-year courses. The Examinations Council had been given to understand that the difficulty was largely one of the existing pressure on accommodation at medical schools. The complaint stated that candidates wishing to pursue a medical course were being advised to enter the medical schools so soon after matriculation as their age allowed and to take the first-year courses there instead of remaining at school for two more years to take the higher certificate with a view to obtaining exemption from the first medical examination. The masters and mistresses viewed this tendency with much concern because the withdrawal of intending medical students from the schools soon after matriculation must inevitably have a harmful effect upon sixth-form science work. The medical schools, moreover, recommended that between matriculation and entry to the University intending medical students should pursue courses of study in subjects other than those bearing on their medical studies in order to acquire a general cultural and educational basis on which to build their medical education. The masters suggested that the medical schools had overlooked the fact that in hard times pupils would not wish to stay at school to take a course which bore no relation to their future studies, nor would they wish to offer for the higher school certificate examination, particularly if they were candidates for State scholarships, subjects in which they had no special interest. There was no valid reason, in the opinion of the masters' association, why the medical schools should bring pressure to bear upon candidates to adopt an alternative procedure which would not only involve them in greater expense but would induce them to enter college at an earlier age than was desirable.

The Education Committee of the Council, after considering the matter, felt that it was not one in which any intervention on the part of the Council was called for, but trusted that compliance would be secured with the recommendations of the Council in regard to preliminary general education which had been in operation since 1938.

The Council endorsed this view.

The report of the Examination Committee, presented by Dr. R. J. BROCKLEHURST, consisted of a summary of the annual returns of professional examinations held in 1940. The highest percentage of passes at the final examinations in medicine was at St. Andrews (90.32), and the lowest at Cambridge (59.41); the highest in surgery was also at St. Andrews (95), and the lowest at the Apothecaries' Society of London (42.86).

The Public Health Committee, under the chairmanship of Mr. JOHN RITCHIE, embodied observations of the Universities of Durham and of Glasgow on the report on the visitation made by representatives of the Council of examinations for diplomas in sanitary science, public health, and state medicine.

The Pharmacopoeia Commission

Dr. DAVID CAMPBELL, chairman of the Pharmacopoeia Committee, presented a report from the British Pharmacopoeia Commission concerning the work done during the past six months, which had been concerned principally with the adaptation of the existing standards of the *Pharmacopoeia* to the changed conditions of wartime, and with the preparation of monographs on new substances for which it is evident that pharmacopoeial standards are required. A Fourth Addendum to the *British Pharmacopoeia, 1932*, is in preparation. This will include amendments already made official by notices in the *Gazette*, new monographs prepared for the next volume but which it is now considered should be forthwith made official, and amendments relating to glycerin made in accordance with the recommendations of the Committee on Substitutes for Glycerin and Sugar. In this work the Commission has been in close association with the Therapeutic Requirements Committee of the Medical Research Council and the War Emergency Formulary Committee of the Ministry of Health, and certain of the amendments and new monographs are proposed for inclusion in the Addendum in order that materials required for the prescriptions of the War Emergency Formulary shall have proper official definitions.

Appointments

The Council nominated Mr. C. G. Lowry for appointment by the Minister of Home Affairs, Northern Ireland, as a member of the tribunal constituted under the Dangerous Drugs Regulations, 1938. This tribunal deals with cases in which it is suspected that a practitioner is supplying or prescribing drugs or preparations for himself or other person otherwise than is properly required for medical treatment. The tribunal consists of three medical practitioners with a legal assessor, one of the members to be appointed on the nomination of the Council, the others to be appointed by the Minister.

Under the Temporary Provisions Order whereby in the event of the office of a direct representative becoming vacant the Council itself may fill the vacancy, Dr. Thomas Fraser of Aberdeen, President of the British Medical Association, was elected a direct representative for Scotland to the seat recently vacated by the resignation of Sir Norman Walker.

Prof. Sydney Smith was appointed by the Council a member of the Dental Board.

The chairmen of the Education, Examination, and Public Health Committees—namely, Colonel H. L. Tidy, Dr. R. J. Brocklehurst, and Mr. John Ritchie respectively—were reappointed for 1941-2.

Prof. J. S. B. Stopford was re-elected chairman of Business.

DISCIPLINARY INQUIRIES

Conviction for giving False Information

The Council considered the case of ARTHUR JOHN IRELAND, registered as of Tunstall, Staffordshire, who was summoned on the charge that he was convicted at Chester Assizes in February last of the following misdemeanours: (1) of giving false information concerning a birth, contrary to Sect. 4 (1) (*a*) of the Perjury Act, 1911; (2) of making a false statement in a notice required to be made by a Public General Act of Parliament, contrary to Sect. 5 (*b*) of the Perjury Act, 1911; and was bound over in the sum of £25 to be of good behaviour for two years and to come up for judgment if called upon. Dr. Ireland was present, accompanied by Mr. George Bankes, counsel, instructed by William Gorringe and Co., solicitors.

Mr. Winterbotham, the Council's solicitor, said that these proceedings concerned the alleged birth of a son to Mrs. Ireland on May 13, 1939. Dr. Ireland at this time was not living with his wife, although he saw her at times; and she helped him in his practice by keeping his accounts. She had, however, some years after their formal parting, gone through a form of marriage with another man, and she was accustomed to describe herself as "Lady Haldon." Lord Haldon died in August, 1938, so that if she had a son born subsequently he would inherit the title. It was alleged at the trial that with the help of her secretary, Isabella Blackett, she arranged with a woman in the neighbourhood to take away a baby. "Lady Haldon" was sentenced to three years' penal servitude on the charge of making a false claim about the baby's birth and on two charges of bigamy. Dr. Ireland's part in the affair was to send to the registrar of births and deaths at Knutsford a letter dated March 17, 1939, stating: "I beg to inform you that Lady M. Haldon gave birth to a male child (living) on March 13 at 7 p.m." It was the duty of persons attending a confinement to send a statement to the medical officer of health, and the fact that the statement in this instance was sent to the registrar caused inquiries to be made. When inter-

viewed by a detective superintendent Dr. Ireland said: "I was present at the delivery; at least I delivered the afterbirth. I was the time at approximately 7 p.m.; I could not tell to a moment." In binding over Dr. Ireland, who was a captain in the R.A.M.C., Mr. Justice Croom-Johnson indicated that he might have dealt with the case by way of imprisonment, but he said: "I think the public interest will be best served by allowing you to go back and continue your duty. I have been struck by your military record." There was no evidence that Dr. Ireland was concerned in arranging for a baby to be brought to the house.

Mr. Bankes said that when in 1917 Dr. Ireland married this lady she described herself as 23 years of age, but evidence was called at the trial which showed that she was born in 1878, so that she would have been over 60 at the time of this alleged birth. He had apparently been told that she was going to have this baby; later he saw the baby, and he wrote the letter which formed the substance of the charge. He was unaware at the time that the lady was still legally his wife. He was completely deceived by this woman, and accepted her word that the baby was hers.

After deliberation *in camera* the Council found the conviction proved and instructed the Registrar to erase from the Register the name of Arthur John Ireland.*

Cases following Convictions at Courts-Martial

Several cases came before the Council on convictions from courts-martial. The first was that of JOHN ALEXANDER TOLMIE, registered as of Anlaby Road, Hull, who was charged that being a registered medical practitioner and a captain in the R.A.M.C. he had been guilty of infamous conduct in a professional respect in being found guilty at a general court-martial held at Reading on September 20 last of being drunk at Botley when on active service, and was sentenced to be dismissed from the Army.

Dr. Tolmie was present and was represented by Mr. A. A. Pereira, counsel, instructed by Messrs. Le Brasseur and Oakley, for the London and Counties Medical Protection Society.

The Council's solicitor handed in the certificate of the conviction, and said that Dr. Tolmie had been previously before the Council in 1922 on petty sessional convictions on two occasions of driving a motor-car or of being in charge of a car while under the influence of drink. Dr. Tolmie in evidence admitted the charge and expressed his great regret. Since his previous conviction until the Botley incident he had given no cause for complaint on the ground of insobriety. At the time of the incident he was worried about his private affairs and was induced by a friend to take more drink than was good for him.

The Council put Dr. Tolmie on probation for twelve months.

The next case was that of OLIVER WATSON, registered as of Caledon, Co. Tyrone, who had been found guilty by general court-martial held at Dunblane on September 11 1940, of having been drunk in the field when on active service on the previous March 24 and May 24. He had been sentenced to be dismissed from His Majesty's service.

Dr. Watson was represented by Mr. R. S. Carden, solicitor, who said that Dr. Watson denied having been drunk on these occasions. His Irish brogue might be mistaken for indistinctness of speech due to drink. He also complained that five or six months had elapsed between the occurrence which had led to the charge and the date of the court-martial. The occurrences took place in France before the Dunkirk evacuation and the court-martial in Scotland. If there was any substance in these charges he should have been dealt with on the spot. The interval seriously handicapped the defence in getting evidence. The tradition in the British Army that an officer should not say anything against an N.C.O. had also worked unfortunately against Dr. Watson in this instance.

In this case also the respondent was placed on probation for twelve months.

In two other cases in which a charge of drunkenness had led to a court-martial and dismissal from the Service there appeared to be some doubt as to whether notice had been served on the practitioners, and both were postponed to a later session.

Charge of Canvassing and Advertising

The case of HORATIO MATTHEWS, registered as of 30, Harley Street, London, came again before the Council. In May, 1940, the Council found that this respondent had canvassed and advertised for the purpose of obtaining patients and promoting his own professional advantage (*Supplement*, June 8, 1940, p. 90) and he was placed on probation for twelve months.

Dr. Matthews did not now appear before the Council, but a letter from him was read in which he said: "Six months' deliberation has confirmed my opinion that the G.M.C.'s action in publishing in the daily press that it had been proven against me that I advertised for eye patients was both unjust and illegal. As appeal against it is beyond my power I am now, after this letter reaches you, regarding myself as in your Council's judgment guilty of infamous conduct in a professional respect on this account. I shall accordingly hereafter conduct my calling as if removed from the *Medical Register* . . . In a later letter he wrote: "I will not recognize the proceedings of the Council of May last, and . . . I hold them to be both illegal and unjust. Therefore I shall not appear before the Council again."

The Council judged Horatio Matthews to have been guilty of infamous conduct in a professional respect and instructed the Registrar to erase his name.

Convictions for Drunkenness

A large number of the remaining cases arose out of police-court convictions of drunkenness or cognate offences. REUBEN DENNY, registered as care of a firm in Jermyn Street, S.W., against whom judgment had been postponed at a previous session after convictions for driving a car under the influence of drink and for being drunk and incapable had been proved, was called but did not appear. It was stated that he was serving in the Royal Navy, and the case was again postponed.

*This is the first case of false certification with which the Council has had to deal since the issue of the President's memorandum drawing attention to the necessity for extreme care in such certification.

E.M.S.: CLASS III PRACTITIONERS' FEES

THE following circular (No. 2394) has been sent by the Ministry of Health to county and county borough councils and other authorities with hospitals in the Emergency Medical Service and to voluntary hospitals in the scheme.

1. I am directed by the Minister of Health to refer to Circular 2176 dated October 19, 1940, which announced certain modifications in the terms of service of Class III officers of the Emergency Medical Service and in the method of payment for medical services remunerated on the accepted bed basis at voluntary hospitals, and to Circular 2329 dated April 19, 1941, which specified the conditions under which payments of one guinea were to be made for Service out-patients in accordance with paragraph 3 (*e*) of Circular 2176.

2. The following further arrangements have now been agreed, after consultation with the Advisory Emergency Medical Service Committee, and in so far as they modify existing practice will take effect, as regards paragraphs 3 and 4, as from March 1 last, and as regards paragraph 5 from June 1 next.

3. *Method of calculating sessional fees of Class III practitioners at hospitals at which the sessional method of payment is in operation.*

(*a*) In accordance with existing practice, short sessions of less than one hour each occurring in any week running from Saturday midnight to Saturday midnight are to be aggregated and the total hours so ascertained divided by two, the result being the number of sessions to be paid for. If the remainder is half an hour or more it is counted as a full session. If it is less than half an hour it will be disregarded, but if the total time worked in a week is less than half an hour it will be carried forward to the next week in which further service is given. Sessions lasting between one and two hours are counted as one session. Where a practitioner attends continuously for more than two hours, the same principles are applied to the excess over two hours. It is proposed to incorporate this system in the contracts of Class III officers.

(*b*) Where the sessional fee is, owing to distance from the practitioner's home or consulting-room, in excess of 2½ guineas or 1½ guineas as the case may be, the excess is payable for each session, however short. In other words, the principle of aggregation applies to the basic fees and not to the additional sums which represent an allowance for time and mileage. Thus, if a practitioner attends for twenty minutes on each of four occasions in one week at a distance for which the scale fee is £2 12s. 6d., plus 5s., he will be entitled in all to £2 12s. 6d., plus four times 5s.—total £3 12s. 6d.

(*c*) Where a Class III practitioner is specially summoned to attend a particular patient owing to some urgent condition and out of the normal course of his visits to the hospital, a basic fee of 1½ guineas for a specialist and 1 guinea for a general practitioner will be payable where the period of attendance at hospital is less than one hour. Where the period is between one and two hours the full fee of £2 12s. 6d. or £1 11s. 6d., as the case may

be, will be payable. If the period exceeds two hours, the same principles will be applied to the excess over two hours. Where, however the practitioner is so summoned at night—i.e., between 9 p.m. and 6 a.m.—payment at the full sessional rates will be made irrespective of the length of the period of attendances. Special calls to which this paragraph applies would not be included in the process of aggregation.

4 *Administrative Sessions.*

The arrangements referred to in paragraph 2 (3) of Circular 2176 normally apply only in the case of Class III officers attending hospitals where the sessional method of remuneration is in force. When in an occupied bed basis hospital a Class III consultant or specialist who does not normally visit the hospital is required by the hospital officer to undertake administrative work exceptionally, the appropriate sessional fee will be payable.

5 *Payments for second opinions or special investigations.*

As from June 1, 1941, the conditions for the payment of the fee of 1 guinea referred to in paragraph 3 (*e*) of Circular 2176 will be as follows:

(*a*) The fee will be payable where the medical officer sending the patient desires a second opinion or special investigation (or both) by a physician or surgeon or other medical officer in clinical charge of patients on the visiting specialist staff of the hospital, and submits a statement of the patient's condition or other relevant facts together with an indication of the matters on which he desires a consultant opinion or investigation. The specialist will be required to state his opinion on the result of the special investigation in writing, and a copy of the report must be retained by the hospital. Where the patient is referred for admission—if that should be considered advisable—the fee of £1 1s. 0d. will not be payable, but if he is referred for a second opinion and as a result of the examination by the specialist is admitted to the hospital, the fee of £1 1s. 0d. will be payable in the usual way.

(*b*) In certain hospitals it is the custom for the medical officer of a special department—e.g., a radiologist or pathologist—to make a special investigation and report within the scope of his specialty, without any examination of the patient by a specialist in clinical charge of patients as defined in (*a*) above. Where a medical officer sends a patient to one of these hospitals for an investigation of this kind the fee payable will be on a scale which is being drawn up in consultation with the Central Medical War Committee and not at the flat rate of 1 guinea. The scale will be communicated to you in due course. In other respects the conditions specified under (*a*) will apply.

(*c*) Not more than one fee of £1 1s. 0d. will be payable in respect of services to any one patient in connexion with the same disability. Where the services of more than one practitioner are involved, these will be covered by the fee, the apportionment of which will be a matter for the medical staff of the hospital to decide (see (*g*) below).

(*d*) Payments as set out above may also be made under the same conditions for references of civilian patients from other hospitals within the Emergency Hospital Scheme, and for Service patients, whether sick or injured, sent from another hospital. They may also be made in the case of recruits to the Women's Auxiliary Services in respect of whom the Service Department, after examination by members of medical boards, desires specialist advice before deciding whether the recruit is to be accepted.

(*e*) The fee will not be payable where the practitioner responsible for the second opinion or special investigation, or all the practitioners, if there are more than one, is or are in receipt of a full-time salary from the hospital.

(*f*) The patients in respect of whom fees are payable must be clearly identifiable in the hospital's registers, so that the particulars may be available for audit purposes where required.

(*g*) Subject to the above, the fees will be repaid to the hospital and the subsequent disposal of the moneys to individual members of the hospital staff will depend upon the scheme approved by the medical staff. These special fees should be shown at the foot of the monthly statement of out-patient attendances and included in the total in the periodical claim from the hospital on Form A.G.136.

(*h*) Where Service or other patients are sent to out-patient departments for treatment and not under the foregoing procedure, the normal capitation fees will be payable—i.e., 1s. 6d. (with the guaranteed minimum of 1 guinea) if the patient is admitted and 6d. if it is decided to give out-patient treatment.

The Home Office announces that Drs. Henry Scott Buckland and Clifford Gordon-Wilson are once more authorized persons for the purposes of the Dangerous Drugs Act, 1920.

Correspondence

Bedside Manners

SIR,—Dr. S. F. Marwood in his paper, "Free Choice of Doctor" (*Supplement*, May 17, p. 66), advocates teaching students the art of "handling people" or "bedside manner," although he does not like this term. I suggest that the student might be advised to peruse the following extract from Burton:

"'Tis an ordinary thing with us to account honest, devout, orthodox, divine, religious, plain-dealing men idiots, asses, that cannot or will not lie and dissemble, shift, flatter, adapt themselves to the station in which they were born, make good bargains, supplant, thrive, fawn upon their patrons, learn the usual methods of getting on, be scrupulous in the observance of laws, manners, customs, praise in glowing terms, defend with vigour, adopt others' opinions, doubt nothing, believe everything, endure everything, resent nothing, and do all the other things which lead to promotion and safe position, which make a man fortunate beyond all question, and truly wise, according to our notions; that cannot temporize as other men do, hand and take bribes, etc., but fear God, and make a conscience of their doings. But the Holy Ghost, that knows better how to judge, He calls them fools."—*The Anatomy of Melancholy*, vol. I.

Dr. Johnson said of Fitzherbert, in whom he considered that there was no sparkle and no brilliancy: "He was an instance of the truth of the observation that a man will please more upon the whole by negative qualities than by positive; by never offending than by giving a great deal of delight. In the first place, men hate more steadily than they love; and if I have said something to hurt a man once, I shall not get the better of this by saying many things to please him."

The young doctor may find a brusque manner an expensive luxury, but an invariable courtesy so readily extends itself to obsequiousness, and then favours exploitation and oppression of the profession of which we now have sufficient.—I am, etc.,

Gloucester, May 17. C. DE W. GIBB.

Postgraduate News

The Fellowship of Medicine announces the following courses for Final F.R.C.S. candidates: (1) Clinical demonstrations, 2 p.m., Wednesdays, July 2 to 23; (2) Revision course, daily 10 a.m., July 7 to August 1; (3) Practical operative surgery, Mondays, Thursdays, and Fridays, 2 p.m., July 7 to August 1; (4) Urology course, Thursdays, 2.30 p.m., August 7 to 28.

WEEKLY POSTGRADUATE DIARY

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.—*Brompton Hospital*, S.W.—Mon. and Thurs., 5 p.m., M.R.C.P. course in Chest Diseases. *West End Hospital for Nervous Diseases.*—Tues. and Fri., 3.30 p.m., M.R.C.P. course in Neurology. *Royal Chest Hospital*, City Road, E.C.—Wed., 3.30 p.m., M.R.C.P. course in Heart Diseases.

EDINBURGH POSTGRADUATE LECTURES.—At Edinburgh Royal Infirmary, Thurs., 4.30 p.m. Prof. Sydney Smith: Wounds from Firearms.

DIARY OF SOCIETIES AND LECTURES

ROYAL SOCIETY OF MEDICINE

Section of [illegible].—Wed., 4.30 p.m. Dr. A. P. Cawadias.
General Meeting.—Fri., 5 p.m. Candidates for Fellowship.
Section of [illegible].—Annual general meeting. Discussion: Factors which make for Safety in the Pre-operative and Post-operative Treatment of Carcinoma of the Rectum.
Sections of Laryngology and Otology.—Fri. Combined summer meeting at Horton Hospital, 10 a.m., 11.30 a.m., Discussion: Relationship of to Thoracic Surgery, 2.15 p.m., Mr. V. E. [illegible] Ear, Nose, and Throat Department in the E.M.S.

APPOINTMENTS

MCINTYRE, D. M., M.B., Ch.B., Examining Factory Surgeon for the Scalbergh District (Yorkshire, West Riding).

B.M.A.: Branch and Division Meetings to be Held

BATH, BRISTOL, AND SOMERSET BRANCH: BRISTOL DIVISION.—At Physics Lecture Theatre, Royal Fort, University of Bristol, Thursday, June 12, 3.30 p.m. Symposium: "Experiences of First Aid in Air Raids." Opener, Dr. H. M. Golding; other speakers, Prof. R. H. Parry, Dr. I. G. Davies, Dr. A. M. Fraser, Dr. M. E. J. Packer, Dr. J. Morton Evans, junior, Dr. W. Woolley, Dr. W. H. Hayes, Dr. H. D. Pyke, and Dr. R. J. Stephen. All medical practitioners are welcome to attend the meeting.

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

BIRTH

ROBINSON.—On May 13, at Denison Hall, Leeds, to Joy (née Portlock), wife of Lieut. G. B. Robinson, R.A.M.C., of Woodside, Knaresborough, a son.

'HYPOLOID' BRAND SULPHANILAMIDE L.S.F.

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and
TISSUE REPAIR
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Whilst promoting cell mitosis, Allantoin in no way retards or interferes with amoeboid cell-movement.

Allantoin is non-toxic and non-irritant.

Mode of Application

Allantoin may be used as a powder, or in aqueous solution by means of gauze packs steeped in the liquid. Alternatively, the 2% ointment may be applied to the lesion; in the case of deep wounds, gauze impregnated with the ointment may be packed into the cavities. Sulphanilamide with Allantoin should be employed in cases of gross infection.

Preparations

The following forms are now available: pure substance; sterile solution in n. saline; 2% ointment in special 'Fissan' base; 2% ointment with 5% or 10% sulphanilamide for cases of infection; also Allantoin powder 4% with sulphanilamide 96%. The medical profession is invited to send for literature and further information to the manufacturers: Genatosan Ltd., Loughborough.

ALLANTOIN
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 14 1941

THE BACTERIOLOGICAL INVESTIGATION OF WOUNDS TREATED BY THE CLOSED-PLASTER METHOD

BY

JEAN ORR-EWING, B.M. J. C. SCOTT, M.S., F.R.C.S.

AND

A. D. GARDNER, D.M., F.R.C.S.

Although the last war left us with a good general knowledge of the bacterial flora of open wounds, the present increasing use of the closed-plaster method of treatment calls for more information about the special characters and changes of the flora under these peculiar conditions; and it is this type of information that we have aimed at obtaining.

At the outset it was clear enough that completely covered wounds cannot be adequately investigated without devising some means of bacteriological access to the wound as often as desired; and our investigation therefore began with the invention of a transparent window, easy to open and to close again hermetically, which could be incorporated in the plaster casing of any limb. In this we had the advice and collaboration of Prof. Seddon and Messrs. Corry, Foley, and Elliot Smith. One of the results of the work has been the development of a type of window more satisfactory than the first one, which was found to have a bad effect on the surface of the wound directly under it; and we hope that our experience may be of use to other workers in this field.

At the outset we expected a large number of air-raid casualties to be available, but it has been our happy misfortune to have instead only a slow trickle of compound fractures and lacerations such as occur at all times in civil life, with one or two aerial wounds from the surrounding district. Nevertheless, frequent examinations of a few wounds have given some information not available by rarer examinations of many. Up to the present we have made 73 complete analyses from the flora of 10 cases (often with two wounds), first at excision whenever possible, and then at short intervals after the application of the plaster. In the later stages examinations were made at plaster changes and usually, at less frequent intervals, between changes. Windows were not fitted to patients who were up and about.

The subjects investigated all had injuries to the limbs received in road, aeroplane, or machinery accidents (8) or shell-splinter and gunshot wounds (2). All but one had compound fractures. Five of the cases followed from the beginning were operated upon within eight hours of the accident, two at sixteen hours, one at forty-eight hours. Clinical notes are given towards the end of the paper.

Methods

Access to the Wound.—Various types of window have been tried. The ideal opening should fulfil the following conditions: (1) it must not admit extraneous bacteria to the wound either at the time of opening or at intermediate periods; (2) it must allow representative specimens of the wound flora to be obtained; (3) it must not interfere in any way with the treatment of the wound. To fulfil this last condition it was found by experience that free drainage must be allowed and that an even pressure on the tissues must be maintained: for example, if the under surface of

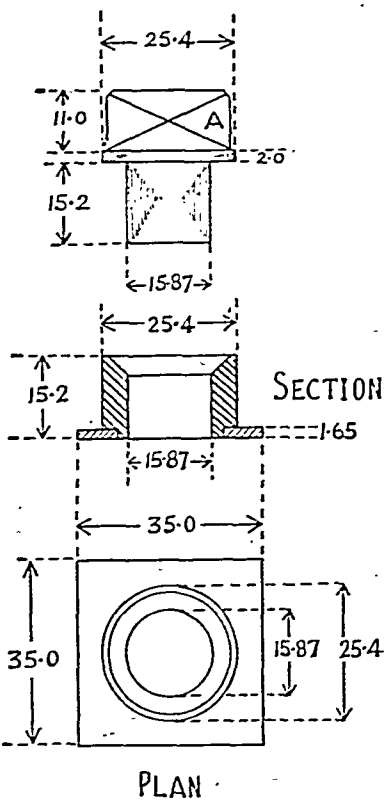


Diagram of apparatus giving access to the wound surface (measurements in millimetres)

the apparatus is not flush with that of the plaster, oedema occurs in the part of the wound immediately beneath the window. The most satisfactory apparatus so far devised (see diagram) consists of a small cylinder (internal diameter 1.5 cm., height 1.5 cm.) mounted on a square plate cm.) bored with a central hole (diameter 1.5 piston fits closely into the cylinder; its upp

so as to cover the cylinder rim, and a rectangular handle is attached. The whole apparatus, which is made by Mr. S. W. Bush of the School of Pathology, Oxford, consists of "perspex," the parts being cemented together with "perspex" cement. (No doubt other plastic material could be used.) The apparatus is sterilized by immersion in 10% formalin, washed in saline, and applied directly over a portion of the wound. Underlying gauze packing is, if necessary, split just beneath the cylinder in order to give access to the tissues. Plaster is then applied as usual, the cylinder being surrounded but not covered. Samples are obtained by momentary removal of the piston and insertion of a swab. We have always scrubbed up and used sterile gloves, masks, and overalls while taking samples. These samples have proved to be representative of the flora, provided that (1) direct access is obtained to the wound surface; (2) the apparatus lies over the most dependent part of the wound. In all respects the apparatus has proved quite satisfactory.

Bacteriological Methods

Direct microscopical observation of the discharge was made at every examination, and was used both as a check of the cultural methods and as a basis for a rough estimate of the absolute and relative richness of the flora.

Cultivation.—In general the methods of isolation recommended in the Medical Research Council War Memorandum No. 2 have been followed: plating on blood agar incubated aerobically and anaerobically, and cultivation in Robinson's cooked meat medium and in litmus milk. We have, however, modified and extended the methods recommended for the detection and isolation of organisms in the presence of *Proteus*. Samples are plated on two horse-blood agar plates containing 0.04% potassium tellurite and on one nutrient agar plate containing crystal violet (1/50,000). One tellurite plate is incubated anaerobically. On this plate haemolytic streptococci and *Staph. aureus* have been found to develop satisfactorily, usually within twenty-four hours. *Proteus* is either completely inhibited or grows in discrete colonies. This is the lowest concentration of tellurite which we have found to prevent spreading growth with certainty. On one or two occasions it has been necessary to replate the picked coccal colonies on further tellurite medium, but the separation from *Proteus* has nearly always been complete at the first pick. Colonies of *Str. pyogenes* after twenty-four hours' anaerobic incubation are small, black, and haemolytic; hence they are readily defected and picked off. In preparing the medium care should be taken to bring all the ingredients to a temperature of about 45° C. before mixing and pouring. Spontaneous haemolysis often takes place in medium mixed at a higher temperature.

Diphtheroids, as is well known, develop, often in pure culture, on the aerobic tellurite plate. Some strains of *Staph. aureus* and very occasionally other micrococci may also appear, but we have usually been unable to isolate the non-pathogenic micrococci in the presence of *Proteus*. This organism is completely inhibited on the crystal-violet plate, on which *Ps. pyocyanea* grows well, as do some members of the genus *Bacterium*.

Findings

Presence of Pathogenic Organisms.—Toxigenic *Cl. welchii* (Type A toxin) was present in one case (No. III). It was first isolated at the fourth examination, which was made a few days after the first change of plaster. It was re-isolated on two occasions during the succeeding month. Four weeks later it had disappeared, and was not found again. The patient never at any time showed any clinical evidence of gas gangrene.

Haemolytic streptococci belonging to Group A and *Staph. aureus* were each found in seven cases; five of these patients harboured both cocci. Both these microbes have invariably persisted in the wound from the time they were first observed to the end of the plaster treatment—in one case for a period of nearly seven months. Dr. F. Griffith kindly typed the streptococcal strains on repeated occasions. All but one belonged to well-recognized types of Group A. The remaining strain, which persisted in the wound for six and a half months, reacted to a group serum, F 69. The type originally isolated persisted in each case throughout the period of observation. One Group B strain was isolated from Case X. It disappeared within a few days, and evidently had no pathological significance. It is of some interest that it was detected in the wound within three hours of injury.

Saprophytic Organisms.—A complete list of the organisms isolated in each case, with the period during which they were observed and an estimate of the approximate duration of the infection, is given in Tables I (persistent microbes) and II (microbes tending to disappear from the wound).

TABLE I.—*Organisms isolated from Wounds. Pathogens and Persistent Organisms*

Organism	Case and Period of Observation[1]	No. of Cases	Approximate Duration
Str. pyogenes, Group A[2]	I (19–240), III (8–86), IV (90–115), V (95–117), VII (1–81), VIII (1–51), X (4–65)	7	Indefinite
Str. pyogenes, Group B	X (1–8)	1	< 16 days
	I (3–172), V (1–117), VI (50–89), VII (1–81), IX (18–31), X (1–65)	7	Indefinite
Staph. aureus	I (1–51), III (26–46), II (7–84), III (8–207), IV (50–100)	1	4–6 weeks
		3	Indefinite
Cl. welchii		1	Indefinite
Proteus	V (1–117), VI (50–89), VII (11–81), VIII (23–51), X (4–65)	4	Variable; few weeks; indefinite
Diphtheroid Type I ..	I (70–205), II (15–28), III (8–207), VIII (11–33)	4	Variable; few weeks; indefinite
Ps. pyocyanea		1	Indefinite

[1] Roman numerals are case numbers. In brackets are the periods of observation in days; day 1 being the day of the excision operation.
[2] Types of streptococcus: Case I, Type F 69; Case III, Type 12; Case IV, Type 11; Case V, Type 11; Case VII, Type 11; Case VIII, Type 27; Case X, Type 12.

TABLE II.—*Non-persistent Organisms*

Organism	Cases	No. of Cases	Duration
Str. viridans	VI	1	< 7 days
Staph. albus	I, III, VI, VII, VIII	5	< 7 days
Micrococcus	I, III, V, VI, VII, VIII	6	< 3 weeks
Diphtheroids other than Diphtheroid Type I	I, III, V, VI, X	5	< 7 days
Bacterium	I, II, V, VIII	4	1–6 weeks
Chromobacterium	II	1	< 7 days
Ps. fluorescens	I, II, III, V, VII, VIII, IX, X	1	< 7 days
Bacillus	II	8	1–4 weeks
Cl. sporogenes	II	1	< 3 weeks
Cl. bifermentans	I, II	1	< 3 weeks
Plectridia (various)		2	Variable

Since wholly harmless microbes usually disappear within a few days or weeks, it is curious to note the persistence of the diphtheroid "Type I." This is in marked contrast with all the other diphtheroid types, which disappear within a few days. This organism ferments glucose, saccharose, and galactose, but not maltose, lactose, or mannitol. It appears to conform to the Type I of the M.R.C. Committee's list of unclassified corynebacteria (Andrewes and others, 1923). In general, the flora of these plaster-treated wounds does not appear to differ materially from that of open ones of similar type which receive early treatment. The incidence of anaerobic infections (from both sporing and non-sporing organisms) is low in comparison with battle casualties in 1914-18 and in 1940. Anaerobes are not, however, commonly found in air-raid casualties, and such wounds, which receive comparatively prompt treatment, appear to have a flora similar to that observed in our series (Douglas, Fleming, and Colebrook, 1920; Miles and others, 1940).

Time of Introduction of Organisms

"*Hospital Infections.*"—We are satisfied that in normal circumstances no infection of the wound takes place through

the plaster casing. Infection has, however, been shown to occur fairly often during plaster applications. Evidence for these statements is based upon observations made on wounds fitted with windows so that the nature of the flora can be repeatedly observed both before and after the change of plaster. Thus, at the first examination made after changing plaster, species new to the wound were detected in 7 out of 12 samples—11 new species being found. On the other hand, 21 samples taken at subsequent examinations before the next plaster change showed no new species. Of our 10 patients, 4 were proved to have been infected in this way. A fifth also acquired new species during a period when he had no window, and the source of infection could not be tested. The bacteria so acquired are listed in Table III. These observations apply only to examinations

TABLE III.—*New Species appearing after First 15 Days of Treatment*

Organism	Case	Plaster No.	Fate of Organism
A. In Patients fitted with "Window" in Plaster			
Str. pyogenes (Group A)	I	2	Persisted > 7 months
Cl. welchii	III	2	Disappeared < 63 days
Str. viridans	VI	2	" < 19 "
Staph. albus	VI	2	" < 21 "
Micrococci (1)	VI	2	" < 21 "
" (2)	VI	2	Persisted > 40 "
Bacterium	I	2	Disappeared < 50 "
Ps. pyocyanea	I	3	Persisted > 133 "
Plectridium	II	2	" > 63 "
Bacillus	III	3	Disappeared < 57 "
	VI	2	" < 39 "
B. In Patients without "Window" in Plaster			
Diphtheroids	V	3 (?)	Disappeared < 39 days
Str. pyogenes	V	Uncertain	Persisted
Str. viridans	V	"	Disappeared < 48 days

made after the fifteenth day following the accident. During the first fortnight new species appear in the wound, often in considerable numbers. For reasons given below we believe these to have been introduced before or during the first plaster application.

Pre-hospital Infection.—Our observations throw no light at all upon the sources of pre-hospital infection—i.e., whether this is acquired at the time of the accident or by first-aid treatment, etc., as suggested by Hare (1940). We are, however, inclined to think that the majority of infecting organisms in our series were introduced during this period in spite of the fact that they were often not detected in the wound for seven or even occasionally for fifteen days after admission. In other words, there appears to be a very considerable lag in development of many species in wounds which have been thoroughly excised and cleansed within a few hours of the accident. Some species appear to have been permanently removed by this procedure: thus 12 strains of various organisms isolated from the tissues removed at operation never reappeared at subsequent examinations. These were *Proteus* (Case V); *Staph. albus* and other micrococci (Cases I and III, four species; Case V, one species; Case X, three species); diphtheroids (Cases I and III); *Ps. fluorescens* (Case II).

The progressive development of new species during the first fifteen days is shown in Table IV (cases treated within eight hours of the accident) and Table V (cases treated sixteen to forty-eight hours after the accident).

Most of the delayed development takes place in the group treated early. The appearance of new species on the third or fourth day is to be expected in this group, for many species of organisms introduced at the time of injury are likely to be present in numbers too small to be detected at the first examination, carried out only two or three hours later. It will be seen, however, that six species appeared between the third and seventh or eighth days, one between the fourth and tenth, and four between the seventh and fifteenth days—a total of eleven species. (Technical difficulties unfortunately prevented specimens from being

TABLE IV.—*New Species first isolated at Various Times during First 15 Days*

Case	Day 1	Day 3	Day 7	Day 12
I (Debridement 2 hours after accident)	Staph. albus	0	0	0
	Diphtheroid (1)	0	0	0
		Staph. aureus	+	+
		Diphtheroid (2)	+	+++
		Micrococcus (1)	+	+
		Micrococcus (2)	0	0
			Micrococcus (3)	+
			Diphtheroid (3)	++
			Plectridium	++
			Bacillus	+
				Day 15
II (Debridement 3 hours after accident)	Bacillus	+	+	+
	Cl. bifermentans	+	+	+
	Cl. sporogenes	+	+	+
	Ps. fluorescens	+	0	0
	Bacterium Sp.	+	+	0
		Chromo-bacterium	0	0
			Proteus	+
				Diphtheroid
				Pyocyaneus
				Plectridium
III (Debridemen 3 hours after accident)	Diphtheroid (1)		0	0
	Diphtheroid (2)		0	0
	Micrococcus (1)		0	0
	Micrococcus (2)		0	0
	Staph. albus		0	0
			Str. pyogenes (Group A)	++
			Enterococcus	0
			Proteus	+
			Ps. pyocyanea	+
			Diphtheroid (3)	+
IX (Debridement 2 hours after accident)	Sterile			Staph. aureus
				Diphtheroid Type I
				Bacillus
		Day 4		Day 16
X (Debridement 2 hours after accident)	H. strep. (Group B)	+	+	0
	Staph. aureus	+	+	+
	Diphtheroid (3 types other than I)	0	0	0
		Diphtheroid Type I	+	+
		Bacillus	±	+
			Enterococcus	+
		H. strep. (Group A)	+	+

Persistence or disappearance shown by + or 0
The numbers in brackets refer to the different types of the microbe

TABLE V.—*New Species first isolated at Various Times during First 15 Days. Cases operated upon late*

Case	Day 1	Day 4	Day 10	Day 14
V (43 hours)	Staph. aureus	+	+	+
	Micrococcus	0	0	0
	Proteus	0	0	0
	Diphtheroid Type I	+	+	+
	Bacillus	+	+	+
			Bacterium	+
				Day 23
VII (16 hours)	Str. pyogenes		++	++
	Staph. aureus		++	++
	Bacillus		+	+
			Micrococcus	0
			Diphtheroid Type I	+
VIII (16 hours)	Str. pyogenes		+	+
	Staph. aureus		+	+
	Micrococcus		+	+
	Bacterium		+	+
	Bacillus		+	+
			Ps. pyocyanea	+

Persistence or disappearance shown by + or 0

obtained from all patients during this period.) Although it is possible that these microbes may have been introduced during the process of opening the window, it seems more probable that they were in fact present but undetected at previous examinations. For, on the first assumption, we should have introduced eleven new species in the course of eleven examinations made between the third and tenth days, while no new species has been detected as a result of twenty-one similar examinations made at later periods. The point needs further investigation, for any delay in

bacterial development at this time, when the barrier of granulation tissue is being built up, may be of great benefit to the patient.

Our reasons for thinking that most (though doubtless not all) of the flora is introduced before and not during débridement are that (1) the number of new species is far greater in the early than in the comparatively late cases, and (2) such infection is by comparison rare at subsequent plaster changes.

Pseudomonas pyocyanea

We have paid some special attention to this organism since the suggestion has recently been revived that it may have a beneficial effect upon wounds and, in particular, that it may inhibit the growth of *Str. pyogenes* and *Staph. aureus* (Trueta, 1939). It has been present in four of our cases (I, II, III, VIII), and three of these have persistently harboured haemolytic streptococci in large numbers; two patients had in addition a *Staph. aureus* infection. The evidence does not suggest that the growth of any other organism is influenced by the presence of *Ps. pyocyanea*.

This question is complicated by the existence of many different strains of the species, which differ in colony form, pigment production, and autolytic action. Only one of our strains (Case III) was highly coloured and strongly autolytic. This strain was not associated with a coccal infection. Very large numbers of observations would be required to show whether this was or was not a purely chance connexion.

The following are the clinical notes of the present series of cases.

Case I

Persistent microbes: *Staph. aureus, Str. pyogenes* (from day 19), diphtheroid Type I, *Plectridium, Ps. pyocyanea* (from day 70).

27/6/40.—A man aged 45 sustained compound fracture of right leg in motor-cycle accident. Admitted to W.M.O.H. 11 a.m. General condition satisfactory; grossly compound fracture, junction of middle and lower thirds of right tibia and fibula. 11.15 a.m., operation: Wound 3 in. × 2 in. on anterior medial aspect; deep wound 2 in. × 1 in. antero-lateral aspect; skin cleaned with soap and water, antiseptic applied to margins of wounds; wound excised, and enlarged to allow removal of extremely lacerated underlying muscle; wound dressed with dry gauze; fracture reduced by manipulation; plaster applied.

8/7/40.—Patient has had a mild serum reaction, with slight rise in temperature. Leg is satisfactory. Plaster changed; wounds show healthy granulations. Slight discharge.

12/7/40.—Temperature elevated. Patient has pain over indurated area in perineum. This area gradually subsided without incision. Patient continued to run a mild evening temperature, up to 100°. Leg satisfactory.

30/7/40.—Plaster changed. Both wounds smaller in size, full of healthy granulation tissue. Fresh plaster applied. Two days following change of plaster patient had temperature up to 102° and general malaise.

2/8/40.—Temperature normal. No complaints.

29/8/40.—Plaster removed. Wounds healing well. Moderate discharge. No local inflammation. Again, following this change of plaster, patient had brief period of temperature up to 102°, which rapidly subsided.

5/9/40.—Patient allowed up, with crutches.

16/12/40.—Plaster removed. Clinically, union sound; both wounds almost completely healed. Radiographs show small sequestrum, which was removed.

16/1/41.—Wound healed. Union firm. Patient up with crutches, bearing weight.

Case II

Main persistent bacteria: *Proteus*; two clostridia ? non-pathogenic; diphtheroid Type I; also, intermittently, haemolytic streptococcus (seen four times but never isolated), and *Ps. pyocyanea*.

Man aged 21, injured in bomber crash. Compound fracture of lower third of tibia; also compression fracture of fourth cervical vertebra (discovered later) and minor injuries.

20/7/40.—Operation 2½ hours after accident. Cleansing and débridement of leg wound 6 in. × 3 in. in size, exposing 5 in. of tibia; full of dirt. Suture of upper third; plaster, with window. Sulphapyridine, 1 gramme i.m. 4-hourly.

21 and 22/7/40.—No significant rise of temperature. Sulphapyridine continued by mouth (0.5 gramme 4-hourly on 22nd), then discontinued.

29/7/40.—Steady improvement without fever. Plaster smelly.

9/8/40.—Plaster changed; good progress in healing.

28/8/40.—" Zimmer distraction " under spinal anaesthesia. Good position of bone achieved (plaster presumably renewed). No subsequent fever.

28/9/40.—Progress has been smooth; pins removed (plaster presumably renewed).

6/10/40.—Plaster removed. Wound healing well.

8/10/40.—Clinical evidence of bony union. Radiological report: " No sound union; some osteitis."

15/10/40.—Transferred.

Case III

Persistent microbes: *Str. pyogenes, Proteus, Ps. pyocyanea.*

At about 6 p.m. on August 23, 1940, a man aged 24 was involved in a motor-cycle accident and sustained injuries to the right leg. He was admitted to Radcliffe Infirmary and found to be suffering from compound fracture of right patella, compound supracondylar fracture of right femur into knee-joint, and extensive laceration of skin and muscles of lower part of thigh. There were no other injuries.

Operation was carried out at 8.45 p.m. under general anaesthesia. The skin was scrubbed with soap and water and shaved. The edges and all devitalized tissue were then excised, including the patella, which was in many small fragments and impregnated with road dirt. The cavities created by this thorough excision of the wound were lightly filled with dry gauze and the limb was encased in a plaster spica.

For about forty-eight hours the patient's condition was very good. He had little pain in the limb and no pyrexia. Then his temperature shot up to 104° and he began to complain of pain around the knee. He was immediately put on sulphapyridine and given 16,000 units of anti-gas-gangrene serum intravenously. A small window was cut in the plaster above the wounds so that the condition of the leg could be seen. There was more than an inch between the skin and the plaster, but no suggestion of gas in the tissues. The temperature settled a bit, but continued to swing up to 101° in the evenings. The plaster was removed on September 9 and a large pocket of pus was found tracking well up on the posterior aspect of the thigh. The large abscess was drained by a postero-lateral incision into its most dependent part.

Since that time the problem has been entirely one of drainage. The patient has had repeated changes of plaster and three operations for removal of sequestra and for drainage. Since the first three weeks his general condition has never given rise to any anxiety. At the time of writing his wounds are reduced to two sinuses, which are healing. The union of the fracture is unsound because of the removal of a large sequestrum.

Case IV

Persistent microbes: *Str. pyogenes, Proteus.*

17/5/40.—A man aged 34 sustained a technically compound fracture of the right femur following a bomb explosion. Was operated on at Bruges three hours later. Wound was sutured without exploration and plaster spica applied.

29/5/40.—Admitted to Pembury Hospital. Skeletal traction with Kirschner wire through lower end of femur on Thomas splint.

8/6/40.—Plaster spica applied.

10/6/40.—Admitted to W.M.O.H. Ill man; high temperature. Toes swollen.

17/6/40.—Plaster removed under general anaesthetic. Original wound opened. Large abscess evacuated. Sequestrum removed. Counter-drainage effected. Thomas splint, with strong traction, applied.

27/6/40.—Drainage improved. Plaster applied.

5/8/40.—Plaster changed under general anaesthetic. Wound healing. General condition satisfactory.

5/9/40.—Plaster removed. Pin inserted through tibial tubercle. Traction and Thomas splint to correct slight overlap.

9/9/40.—Position satisfactory. Plaster spica applied.

7/11/40.—Plaster changed. Wound clean; healing.

20/12/40.—Dressings changed. Two sequestra removed.

10/1/41.—General and local condition satisfactory.

NOTE.—This has been a problem of drainage from the beginning; each rise in temperature and deterioration in general condition has been associated with retention of pus, and has improved following the institution of adequate drainage.

Case V

Persistent microbes: *Staph. aureus*, *Str. pyogenes* (from day 95), diphtheroid Type I.

11/9/40.—9 a.m.: This patient, a youth aged 16, caught his arm in a machine, and was lifted up by the limb. Admitted to High Wycombe Hospital, and found to have compound dislocation of left elbow and compound fracture of both bones of forearm. 1 p.m.: Dislocation reduced under general anaesthetic; excision of wound; vaselined gauze, dressing, and plaster applied. 5 p.m.: Admitted to W.M.O.H. On examination, mild shock. Plaster splint; wound 4 in. long inner medial side of lower end of humerus. Apparently little loss of skin, but wide separation of edges. First dressing and bivalved plaster applied.

13/9/40.—General condition satisfactory. Plaster removed under general anaesthetic. Wound cleaned. Small wound on ventral surface of forearm opened. Some necrotic muscle excised. Dry dressing applied to both wounds. Fresh plaster.

1/10/40.—Discharged home in plaster.

24/10/40.—Plaster removed. Both wounds healing well, and filled with clean granulation tissue. Moderate discharge. Radiograph shows good alignment and early union of forearm fracture. Loss of joint space. Apparently beginning destruction of elbow-joint.

21/11/40.—Plaster changed. Condition as above, with further progress of healing.

17/12/40.—Patient readmitted with fever and some pain in the arm. History: On 3/12/40, while in quarantine for scarlet fever, he had a sore throat and pyrexia, and complained of pain in the elbow. Plaster was split and the wound inspected. He was given sulphanilamide for three days, and condition subsided. On 15/12/40 he again complained of pain, and had a rise of temperature.

On admission the temperature was 104°, with some swelling of the hand; no other signs with regard to the arm. The throat was inflamed and the right tonsil large and oedematous. Plaster changed; wounds healthy; no increase in discharge; no retention of pus. Fresh plaster applied.

19/12/40.—Temperature normal. No complaints. The administration of sulphanilamide was discontinued.

15/1/41.—Seen as out-patient. Has been free from pain and pyrexia since discharged from hospital. Plaster off. Wound of forearm healed. Good progress of healing of elbow wound. Radiographs show firm union of forearm fracture. Increase in destruction of elbow-joint. Plaster reapplied.

5/3/41.—No complaints. Plaster removed. Elbow wound healed except for small sinus. Little discharge.

Case VI

Persistent microbe: *Staph. aureus*.

16/8/40.—5 p.m.: Patient, a man aged 40, had left leg injured as result of enemy action. Admitted to Radcliffe Infirmary. Found to be suffering from very extensive lacerations of calf of left leg, from popliteal space to lower part of tendo Achillis. Large area of skin and underlying muscle shot away. 9 p.m., operation: Skin cleansed with soap and water; antiseptic applied to margins of wound; normal excision of wound, which involved excision of greater part of gastrocnemius, leaving soleus fascia exposed; following excision, dry gauze applied to wound and plaster to mid-thigh. Patient had no rise in temperature, with exception of 100.2° on 17/8/40, and made no complaint of his leg. Plaster was left untouched for seven weeks.

5/10/40.—Plaster removed. Some pus inside plaster; the gauze was removed with difficulty from wound, owing to granulations having grown into it. Wound was clean, granulating well. Fresh plaster was applied. Following this change of plaster there was no rise in temperature and no pain in the leg. Skin graft applied.

25/11/40.—A section of full-thickness skin 3 in. × 1 in. was taken from posterior aspect of left thigh. This wound was sutured, and the piece of skin removed was cut into a large number of small pieces and applied to the granulating surface. Vaselined gauze dressing applied.

18/12/40.—Whole area covered with thin layer of skin.

Case VII

Persistent microbes: *Staph. aureus*, *Str. pyogenes*, diphtheroid Type I.

20/10/40.—Motor-cycle accident, 10.30 p.m., to schoolmaster aged 21. Admitted to Wantage Hospital. Injuries to face, right hand, and right leg. Sterile dressings applied to wound. Laceration of face sutured.

21/10/40.—Admitted to W.M.O.H. General condition satisfactory. Marked contusions of right hand without fracture. Abrasions on dorsum. Oblique compound fracture right tibia and fibula, junction of middle and lower thirds, with wide separation. 3 p.m., operation: Wound 2½ in. × 1¼ in on postero-medial aspect of leg, with muscle protruding; skin carefully cleaned with soap and water, and margins of wound painted with antiseptic; wound enlarged to permit exploration of surrounding muscle; all dead muscle excised; wound dressed with dry gauze, fracture reduced by manipulation, and plaster applied with a perspex window over wound.

25/10/40.—No complaints re leg. Some cough and physical signs in left chest. Temperature 100°. Given sulphapyridine; 2 grammes initial dose, then 1 gramme four-hourly.

30/10/40.—Condition satisfactory. Slight rash over arms and trunk. Sulphapyridine discontinued.

15/11/40.—General condition good. Temperature within normal limits for past fifteen days. Plaster changed under general anaesthetic. Wound clean and granulating well.

18/11/40.—Patient allowed up with crutches.

24/11/40.—Patient had two days' fever, general aches and pains. Diagnosed influenza. Temperature again normal, no complaints.

13/12/40.—Plaster changed. Wound clean, granulating well. Slight excoriation of skin. Radiograph shows some callus formation.

21/12/40.—Discharged from hospital.

6/2/41.—Plaster changed. Wound almost healed. Clinically, fracture has united in satisfactory position. Radiograph shows good callus. Short plaster applied.

Case VIII

Persistent microbes: *Staph. aureus*, *Str. pyogenes*, diphtheroid Type I, *Ps. pyocyanea*.

20/10/40.—Motor-cycle accident to man aged 26. Admitted to Cottage Hospital with injuries to left hand and right knee. Sterile dressings applied to wound.

21/10/40.—Admitted to W.M.O.H. General condition satisfactory. Multiple abrasions dorsum of left hand. Large open wound right knee, with fracture lateral margin of patella. 3 p.m., operation: Wound about 4 in. × 3 in., ragged, with considerable loss of skin, skin of leg and thigh cleansed with soap and water; margins of wound painted with antiseptic; wound excised, including damaged muscle and fragment of patella; following excision of wound, knee-joint was closed with interrupted catgut sutures; wound dressed with dry gauze, and rubber drain inserted through stab wound to effect dependent drainage.

22/10/40.—Following the operation, the plaster was applied from high up in the groin to the ankle. Sulphapyridine, 2 grammes initial dose, 1 gramme four-hourly, was started. No complaints. Temperature 100.8°.

25/10/40.—Temperature normal. No complaints. Sulphapyridine discontinued.

14/11/40.—Plaster removed. Wound clean, granulating well. No infection in knee-joint. Fresh dry dressing and plaster applied.

22/11/40.—Since last change of plaster, patient has made no complaint. Temperature has been normal. Plaster changed. Wound healing well.

17/12/40.—Plaster bivalved. Local dressing of sulphanilamide powder applied.

20/12/40.—Secondary suture of wound. Following plastic operation and suture, moderate rise of temperature for four days, which settled down when a haematoma was evacuated from lateral side.

25/12/40.—Temperature normal. No complaints.

11/1/41.—Wound healed. Patient walking well.

Case IX

Persistent microbes: *Staph. aureus*, diphtheroid Type I.

14/11/40.—A man aged 45 had his right leg injured in a motor-cycle accident. Admitted to W.M.O.H. 5 p.m. with compound fracture of right tibia and fibula at junction of middle and lower thirds. At 5.30 p.m., under general anaesthesia, the wound was exposed. It was found to be a puncture about 2½ in. × 1 in. The skin was cleansed in the usual manner and the wound edges excised; all underlying muscle was viable, and only a small quantity of subcutaneous tissue was excised. Dry dressing; fracture reduced by manipulation; plaster applied.

16/12/40.—Since the operation the general and local condition of the patient has been satisfactory. No pain in leg and no pyrexia. Plaster changed; wound almost healed; little evidence of union of fracture. Fresh plaster applied.

4/1/41.—No complaints. Up on crutches without weight-bearing.

5/2/41.—Plaster changed; very small area not covered by skin. Union progressing; plaster applied below knee.

Case X

Persistent microbes: *Staph. aureus, Str. pyogenes,* diphtheroid Type I.

20/1/41.—At 7.45 p.m. patient, a man aged 61, was knocked down by a bus. Admitted to W.M.O.H. at 8.5 p.m. Found to have compound fracture of upper third left tibia and fibula, with extensive violence to the skin, and a large wound in the popliteal space. No loss of skin on posterior aspect. Medial dislocation of left ankle. General condition satisfactory. 9.50 p.m., operation: Skin cleansed with soap and water; antiseptic applied to margins of wound; the extensive wound of the back of the leg was excised and the skin sutured; the fracture and dislocation of the ankle were reduced by manipulation; dependent drainage was effected by means of rubber tubes through the stab wound. Plaster was applied.

26/1/41.—Patient has had no pain in the leg. Rise in temperature and respiration rate and some sputum. Has been on sulphapyridine for the past five days. General and local condition now satisfactory.

5/2/41.—Plaster changed because of profuse discharge. On removal it was found that the posterior wound was satisfactory, but that a large area of damaged skin on the upper anterior surface of the leg had separated and was lying as a free slough. This was removed. Wound dressed and fresh plaster applied.

21/2/41.—Patient has been running slight evening rise of temperature, but has made no complaint with regard to the leg. Considerable discharge from plaster. Plaster removed. Posterior wound well healed, anterior wound shows large clear area of granulations, about 6 in. long by 4 in. wide. No surrounding infection. Following change of plaster patient had no rise of temperature. General and local condition satisfactory.

Discussion

The cases investigated were selected from a much larger series as being suitable for complete bacteriological examination from the earliest stages to the final healing. One of us is in process of analysing the clinical aspects of the larger series as a whole. Neither the general composition of the wound flora under closed plasters nor the changes of its composition in the early or later stages have given any clear explanation of the virtue of the closed-plaster method of treatment. We have found no striking difference in flora between our wounds and the open wounds described (Miles and others, 1940) during the present war. We have not seen, as we thought we might see, a disappearance or diminution of pathogenic bacteria under the influence of saprophytic anaerobes or of relatively harmless Gram-negative aerobic rods such as *Proteus* or *Ps. pyocyanea.*

Although it is impossible to assert that *Str. pyogenes* (Group A) is completely innocuous in properly immobilized and protected wounds, it is clear enough that this microbe may be present from first to last in wounds which, under these conditions, heal without obvious complications or gross delay; and the same is true of *Staph. aureus.* But these phenomena, it seems, may also be seen sometimes in open wounds.

The method of treatment, we feel, owes its efficacy rather to its physical and physiological effects than to any specific influence on the bacterial flora (Trueta and Barnes, 1940).

The window-sampling method has proved satisfactory when true access to the tissues is provided, and has enabled us to observe changes in the flora at all periods of treatment and to form provisional views about the reasons for the appearance and disappearance of species, and about the protection afforded by the plaster against gross infection.

Summary

A satisfactory method has been devised for securing bacteriological samples from wounds encased in plaster without interfering with the treatment.

The flora of wounds treated in closed plaster does not appear to differ from that of open wounds, and neither its character nor its fluctuations explain the efficacy of the closed-plaster method. Infection of such wounds during the period of hospital treatment occurs fairly often during changes of plaster, but no cross-infection has been detected at any other time.

It is suggested that the multiplication of bacteria is delayed for some days in wounds which are excised and cleansed within a few hours of the accident. Some organisms appear to be permanently removed by this procedure.

No evidence has been found that *Ps. pyocyanea* or any other organism inhibits the growth of haemolytic streptococci or of *Staph. aureus* in wounds.

The Medical Research Council has provided a part-time grant for one of us (J. O.-E.) and a whole-time salary for a laboratory assistant (W. Fincham), as well as money for expenses. Prof. Gardner owes his leisure for research partly to the University of Oxford and partly to the Nuffield Trust. Prof. H. J. Seddon and Prof. H. W. Florey played a large part in launching the research, and Mr. Elliot Smith collaborated on the surgical side during the early stages. Dr. F. Griffith, whose death we lament, kindly typed our streptococci, and Prof. A. A. Miles struggled nobly and successfully with our anaerobes.

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DIABETIC COMA IN A SERIES OF YOUNG DIABETICS*

BY

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This clinical study of diabetic coma is based on a series of 24 young diabetics who have attended Addenbrooke's Hospital during the last twelve years. Some of these cases have already been referred to (Cole, 1934). In 23 the disease came on before the age of 15, and in one patient, aged 18, coma was the first symptom. After standardization as in-patients they have attended as out-patients at intervals of from one to three months until the time (1939) when this study was completed (or in fatal cases until death). With the exception of Case 24 they are unselected and comprise all the diabetics attending my department between 1927 and 1939 who were under 15 at their first attendance. Four live in Cambridge and the remainder in towns and small villages within a radius of fifty miles, often at considerable distances from their doctors, and when complications such as infections or coma develop there is often some delay before they can be treated or be admitted to hospital. A series of young diabetics has been chosen for this study because in youth the results are less likely to be complicated by chronic intercurrent disease.

Incidence of Coma

Table I shows that in 24 diabetics coma occurred 13 times: 7 patients had one attack and 3 had two. In 6 coma was the first recognized symptom of diabetes, and in 7 it occurred during the course of treatment. The whole series covers a period of 165 diabetic years, giving an average of approximately one attack every thirteen years for all cases, including patients who had had no treatment before coma. In cases under treatment with insulin the average was one attack every twenty-three years. These figures are quoted to show the incidence in a small group of patients living under somewhat similar conditions and treated on similar lines.

Table II indicates the possible causes of coma. In 6 out of 13 instances the attack occurred in patients in whom diabetes had not been previously diagnosed, and in 4 of these its onset coincided with an infection. In the remain-

*A communication given to the Ulster Medical Society at Belfast in November, 1940.

TABLE I.—*Incidence of Coma in 24 Young Diabetics*

Case No.	Sex	Year of Onset	Age at Onset	Age in 1939	Insulin Dose[1] in 1939	Carbohydrate in 1939	No. of Times in Coma
						gm.	
1	F.	1925	7	21	90	200	0
2	M.	1925	12	26	60	250	0
3	M.	1926	7	20	50	120	2
4	F.	1931	14	22	70	125	1
5	F.	1929	12	23	50	150	1
6	M.	1933	10	16	70	250	2
7	M.	1929	6	16	32	150	0
8	F.	1929	7	17	50	120	0
9	F.	1926	11	24	40	200	0
10	M.	1927	9	16 D[2]	16[3]	90[3]	0
11	F.	1929	5	13	40	200	0
12	F.	1926	13	25	55	140	0
13	M.	1931	13	21	75	150	1
14	M.	1932	12	19	110	250	0
15	M.	1933	9	15	75	200	0
16	F.	1935	12	16	65	230	1
17	F.	1931	4	5 D	40[3]	110[3]	2
18	M.	1931	13	13 D	—	—	1
19	M.	1932	13	16 D	48[3]	120[3]	0
20	F.	1938	13	14	90	200	1
21	F.	1938	14	15	56	200	0
22	F.	1938	12	13	50	180	0
23	M.	1934	14	19	56	160	0
24	F.	1939	18	18 D	—	—	1

D = died.
[1] Total units per day. Soluble or P.-Z.-I. Usually in two injections.
[2] Also congenital heart disease.
[3] Before death. [6] died. Cause: Coma 3, congenital heart 1, unknown 1.)

TABLE II.—*Details of Coma*

Case No.	Time after Onset of Diabetes	Insulin Dose before Coma	Cause of Coma	Blood Sugar at Onset*	Units of Insulin in Coma	Result
3	(1) 4 yrs.	25	Vomiting; insulin stopped	—	70 in 6 hrs.	Recovered
	(2) 4½ ,,	40	Maxillary antritis	—	60 in 6 hrs.	,,
4	6 ,,	70	*Acute enteritis*	—	200 in 12 hrs.	,,
5	3 ,,	?	Bronchitis; insulin stopped	0.38	160 in 6 hrs.	,,
6	(1) At onset	None	Scalded foot	0.41	55 in 12 hrs.	,,
	(2) 5 yrs.	50	"Cold in head": insulin stopped	1.13	800 in 24 hrs.	,,
13	6 ,,	35	No cause	—	460 in 12 hrs.	,,
16	At onset	None	Very septic mouth and throat	0.73	210 in 24 hrs.	,,
17	(1) ,, ,,	,,	*Feverish cold*	0.5	50 in 6 hrs.	,,
	(2) 1 yr.	36	Bronchitis; insulin stopped	1.37	Died 1 hr. after admission	Died
18	At onset	None	Mumps 5 weeks before? cause	1.4	190 in 12 hrs.	,,
20	,, ,,	,,	No cause	0.7	270 in 24 hrs.	Recovered
24	,, ,,	,,	Bronchopneumonia; septicæmia	0.8	1,370 in 23 hrs.	Died

* Hagedorn-Jensen.

ing 7 instances, when it developed during insulin treatment, an infection was also present in 5. In 4 of the latter the normal dose of insulin had been discontinued on account of either vomiting or failure to take food.

These cases, few as they are, indicate the great importance of infection in precipitating diabetic coma. Occasionally it may develop suddenly in a hitherto unrecognized diabetic (Cases 18 and 20), and rarely in a patient on insulin, without any accompanying signs of infection (Case 13), but in the greater number an acute or chronic infection is a prelude. The most certain way of inducing coma when an infection develops is to stop or reduce the regular dose of insulin.

Usually coma does not occur without some warning history or symptoms to suggest diabetes. Joslin (1935) records 12 cases in a series of 55 in which the diagnosis had not been made before the onset of coma. In children and young adults symptoms may not be present for more than a few days before and may be slight enough for an intelligent parent to ignore. In those who had reported to their doctors, failure to examine the urine in the face of slight but suggestive symptoms was the cause of disaster. The fact that some of these patients were children made the diagnosis more difficult when the essential urine tests were ignored.

Diagnosis of Coma

Some factors which suggest a diagnosis of coma are: previous attacks of coma, untreated or badly controlled diabetes, recent chronic or acute infection, and reduction or stoppage of the regular dose of insulin. The more important warning signs and symptoms are: vomiting, abdominal pain, signs of dehydration, alteration of breathing, sugar in the urine, a positive Gerhardt test, and a raised blood sugar. The incidence of these symptoms in the 13 cases of coma in this series is shown in Table III.

TABLE III.—*Signs and Symptoms in 13 Cases of Coma*

Inability to take regular diet at onset	10
Vomiting at onset	7
Abdominal pain at onset	5
Dehydration	13
Altered breathing (sighing 7; hyperpnœa 6)	13
Sugar in urine (heavy reduction)	13
Rothera's test (strong; 1 weak for 6 hours)	13
Gerhardt's test (absent for first 6 hours in 1)	13
Blood sugar at onset	0.33 to 1.4%

This table shows the importance of vomiting and abdominal pain as early symptoms of coma. If these were more widely recognized as such, insulin would be less often stopped or reduced at the onset. Inability to eat the usual food may be a symptom of coma, and is not an indication to reduce insulin.

The urinary findings were almost constant. Rothera's and Gerhardt's tests were strongly positive in all but Case 6, which is unusual enough to quote.

Case 6.—The patient developed diabetes in 1933 at the age of 10, when he was admitted in early coma after scalding his foot. Diabetes had not been previously diagnosed. He recovered, but for the next five years he was always difficult to control, and mild infections were very apt to upset him. He was tried on various diets and did best on: C. 180, F. 56, and P. 105, with 70 units of insulin daily. He was a sensible boy, with anxious but not very intelligent parents.

His second attack of coma occurred in 1938. Five days before admission he developed a cold in his head. The day before admission nausea and later vomiting came on, and because of this no insulin was given on the morning of admission. He was admitted at midday almost unconscious, with all the classical clinical signs of coma (see Table III). His blood sugar was 1.13%.

The urinary and blood-sugar findings were as follows:

	Rothera	Gerhardt	Blood Sugar
Midday	Faint positive	Negative	1.13%
3 p.m.	Positive	,,	
6 p.m.	,,	Faint positive	
7 p.m.	,,	Positive	0.58%

At 4 p.m., two hours after 100 units of insulin, the CO_2-combining power was 15 volumes %, the blood urea 39 mg. per 100 c.cm., and the blood chlorides 500 mg. per 100 c.cm. Throughout the whole coma there was no marked diminution of urine.

After 800 units in twenty-four hours (700 in the first ten hours) and a continuous intravenous-drip saline, 3,000 c.cm. in twelve hours (the last 1,500 c.cm. contained only 5% glucose), the blood sugar was normal, Gerhardt's test was negative, and the patient had recovered.

This patient, although a very severe case of diabetic coma, showed only a faintly positive Rothera and a negative Gerhardt test on admission, and the latter did not become strongly positive until he had been in coma for at least six hours.

Joslin (1935) states that in coma the urine almost invariably contains a large quantity of diacetic acid, as shown by a positive Gerhardt test, and that only in cases with an associated renal block does one see a negative test for acetone bodies. Richardson (1932) describes a case with a CO_2 of 7 volumes % which had no diacetic acid or acetone in the urine. Payne and Ponlton (1925), Oliver (1926),

and Graham *et al.* (1929) also describe cases. In this patient there did not appear to be renal block, and the explanation of the slow appearance of diacetic acid in the urine is not clear. In diagnosis it is important to remember that although a positive Gerhardt test is present in nearly all cases of coma there are occasional exceptions to this.

Blood-sugar readings of over 1% occurred in three patients: one (Case 6) recovered, the other two (Cases 17 and 18) had both been unconscious for many hours before admission and died. The blood-sugar readings were 1.13, 1.37, and 1.4% respectively. In Case 24 (bronchopneumonia and septicaemia in a hitherto undiagnosed diabetic) the blood sugar was 0.8% on admission. 1,370 units of insulin in twenty-eight hours reduced it to normal, but death occurred a day later. Joslin states that in a series of 293 the blood sugar was over 1% in 11, and of these 4 died. Curtis and Dixson (1928) describe a patient with a blood sugar of 1.68% who recovered, and Haines and Davis (1932) 3 others of over 1%, with recovery.

Treatment of Coma

Diabetic coma is one of the most acute emergencies in medicine, and an hour lost may mean death. The indications are: insulin and glucose to make possible the complete oxidation of fats, fluid for dehydration, sodium chloride for salt deficiency, and warmth and ephedrine for circulatory failure and shock. Symptomatic treatment, which includes gastric lavage for severe vomiting and enemas for constipation, is also important.

Insulin cannot work without glucose, but in the early stages the blood sugar is usually above 0.4% and there is no likelihood of glucose deficiency. When the blood sugar is known to be high it would seem unnecessary to give additional glucose. In the later stages of treatment, when the blood sugar is falling, and particularly when it cannot be watched by frequent readings, it is important to give extra glucose. This also ensures that there is no overshoot into hypoglycaemia. In practice the decision whether to give glucose or not in the early stages depends on the experience of the doctor and the biochemical facilities available. If no blood-sugar reading can be obtained, or if the doctor is inexperienced, glucose should be given from the start.

The dose of insulin is difficult to judge, as there is great variation in the requirements of different patients. Dosage depends on the depth and duration of the coma, the severity of any infection present, the previous dose of insulin and whether this had been discontinued, and what is known of the patient's response to insulin in the past. A patient who goes into coma while balanced on a certain dose of insulin (usually because of an infection) tends not to need such a large dose. Insulin should be given as soon as possible in a dose of from 20 to 100 units, but usually not less than 50, repeated every one or two hours according to the clinical and biochemical progress. In these patients the average dose needed in the 10 who recovered was 236 units in from twelve to twenty-four hours. This average was raised by 1 patient who needed 800 units. Of the 3 fatal cases, 1 died at once, 1 had insufficient insulin, and 1 had 1,370 units in twenty-eight hours.

The early administration of fluid and sodium chloride in the form of normal saline is as important as insulin. This may be given by the mouth to patients who are still able to swallow, and also rectally, subcutaneously, or by intravenous drip. The last method is the one of choice in all patients with severe dehydration. 5% glucose should be added when it is considered necessary. In this way 6 pints or more may be given in twelve hours. Root and Riseman (1938) emphasize the importance of very large amounts of fluid intravenously in severe cases, particularly after a history of prolonged acidosis, unconsciousness for more than six hours, repeated vomiting, excessive dehydration, and suppression or diminution of urine, and quote cases in which 8,000 c.cm. and 6,800 c.cm. were given intravenously in eight and thirty hours respectively, in addition to large amounts of subcutaneous saline. In our series continuous intravenous drip was given to severe cases in which the patients were unable to swallow fluids. When the initial blood sugar was very high glucose was not added until it had fallen. In milder cases, when fluid was given orally, rectally, or subcutaneously only, glucose was added from the start.

Prevention of Coma

In diabetes, even under the best conditions, some attacks of coma are inevitable. The series quoted here, although it cannot be regarded as a random sample of the diabetic population, does indicate how far in one area the management and treatment in the home fall short of the best that could now be obtained. There are two causes for this: (1) failure to diagnose diabetes before the onset of coma (6 cases, 2 fatal); (2) failure to treat diabetes properly during an infection, or when for any reason the usual diet cannot be taken (6 cases, 1 fatal).

Thus in this series of known diabetics under treatment coma occurred only once without an obvious cause. In the remainder proper treatment of infections or failure to take food, by rest, warmth, fluids, glucose, and continuation or increase of the regular dose of insulin, would almost certainly have prevented coma.

The remedy lies, first, in more thorough teaching of the medical student at hospital on the routine management of diabetes. In many teaching hospitals diabetes tends to be treated in separate clinics, and if, as is often the case, a student clerks for a physician who is not interested in the subject, he may fail to receive any practical instruction. Secondly, there must be more thorough teaching of the patients or, in young children, of their relatives. Failure here is often due to insufficient trained staff at the diabetic clinic. Thirdly, co-operation between the patient, the family doctor, and the specialist at the clinic must be closer. It is unfortunate that many diabetics who attend clinics regularly tend to lose touch with their home doctors. This is unsatisfactory, because when an emergency arises at home their doctors are not in possession of the necessary facts.

Diabetes is still, twenty years after the discovery of insulin, one of those conditions in which there is a great lag between knowledge and its application.

Summary

The incidence, causes, symptoms, and treatment of diabetic coma in a series of 24 young diabetics are analysed.

13 attacks occurred in these patients. In 6 of these diabetes had not previously been diagnosed. In 7 which came on during treatment insulin had been discontinued in 4 on account of vomiting or failure to take food. An acute infection preceded the onset of coma in 9.

Most attacks could have been prevented either by earlier diagnosis of diabetes or by proper management of infection during its course.

I should like to thank Dr. J. F. Gaskell, under whom 3 of the cases were admitted, and Dr. R. J. Twort for his help with several severe cases of coma.

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DIFFERENTIAL DIAGNOSIS OF CONTUSION OF THE BRAIN AND PSYCHONEUROSIS

BY

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The Personal Injuries (Emergency Provisions) Act provides that compensation to civilians injured by enemy action shall be payable only for disablement caused by physical injuries. The diagnosis between contusion of the brain following concussion and psychoneurosis accordingly becomes of great importance, and as it is clear that the distinction presents some difficulty in the certifying of these conditions, it is hoped that the following account of cases I have examined recently for the Ministry of Pensions may be helpful. I have to thank the Director-General of Medical Services for permission to publish the record. The observations are based on an examination of some 300 persons injured in air raids whose disorders had been diagnosed as "shock," "nerve shock," "bomb shock," "concussion," "anxiety neurosis," and "neurasthenia." These people were seen after an interval of three to five months from the incident alleged to have been responsible for their condition, but the notes of those who had been taken to hospital at the time were available. They included persons of all ages from 15 to 82, and of both sexes, with a slight preponderance of women. This long series of consecutive cases afforded an excellent opportunity of comparing the two conditions.

The term "nervous shock," the diagnosis most often used, possesses no medical precision, though it may be convenient and non-committal as a temporary description in the early stages, but its use had been continued in weekly certificates long after accurate diagnosis had become possible. Actually the cases fell into three groups: those showing a typical post-concussional syndrome or chronic cerebral contusion, forming about 30% of the total; those equally clearly suffering from some form of anxiety state—about 50%; and the remainder showing a combination of these two conditions. There was, however, very little correspondence between the diagnoses made at the time of the injury and those which could be made with assurance at a later date.

Influence of Physical Injury

Since the publication of Trotter's papers on head injuries it has been universally accepted that the syndrome of which headache is the most prominent symptom, so often seen after concussion, is the result of physical injury —i.e., contusion of the brain. On the other hand, there is no evidence that physical injury will produce a psychoneurosis, although the contrary view is widely held. If we listen to the evidence constantly given in the county courts we find that many doctors regard it as almost axiomatic that a physical injury may produce or precipitate an anxiety state, which is variously described as "traumatic neurasthenia," "nerve shock," etc., and this is the teaching of at least one of our leading textbooks on medicine. Nevertheless, experience under the Workmen's Compensation Act and in the treatment of ex-Service men suffering from war neurosis has convinced me that where neurotic symptoms become manifest immediately after a physical injury the effect has been produced not by the physical injury itself by the psychic concomitants of that injury. The influence of fear and suggestion may be exercised at three stages: before the accident, when the person is in a state of terror, if only for a brief period; immediately after the physical impact, when he finds himself lying on the ground bleeding and in pain, and, for all he knows, may be going to die at once; and at a later stage when, it having been found that the physical injuries are not serious, he is nevertheless sent to bed, certified by his doctor to be suffering from "shock," and treated as if seriously ill. Months later this type of patient may come up in court still claiming to be suffering from "shock," supported by medical evidence, long after physical injuries have been forgotten or are represented by healed, non-disabling scars. As the belief in the physical causation of "traumatic" neurosis is so generally held it is desirable briefly to summarize the grounds for the opposite opinion.

In the first place there is no clinical difference between "traumatic" neurosis and the neurosis resulting from other agencies. The anxiety state in the "shell-shocked" soldier was found, under treatment, to be identical with the anxiety state in the soldier who had broken down during training without having received any physical injury, and to have its root in the same ultimate type of psychological disturbance. The injured workman presents no features not equally met with in the unscathed. Even with the hysterical muscular contractions or flaccid paralyses occasionally associated with an injury to a limb, the injury has done nothing more than determine the seat of manifestation. That it is still the psychic factor which is operative is shown by the fact that these affections correspond to no anatomical lesions, but to the patient's conception of his injury.

Another significant point is the well-recognized fact that "traumatic neurasthenia" is far more likely to be associated with slight injuries than with serious lesions, yet if physical injury is the cause of the condition it might reasonably be supposed that the greater the injury the greater the likelihood of the appearance of neurotic symptoms. The explanation usually given of this fact is that the neurosis develops to meet a wish—escape from the battlefield in soldiers, compensation or damages in injured civilians—and that the seriously injured person has no need to display such symptoms. Wish-fulfilment may be a factor in some instances, although I have long been sceptical of its playing any material part in compensation cases: exaggeration of symptoms in the hope of obtaining a lump sum is not rare, but this is not a neurosis. Another, and probably more important, consideration is that the seriously injured person knows what is the matter with him, and is therefore much less likely to have suggestion of psychic injury forced upon him. He can see for himself an open wound, and he knows what a broken leg means. The victim of "shock," on the other hand, is suffering from an unfamiliar and almost mysterious entity, and it comes to him with all the force of medical authority. There are reasons for thinking that the use of the term "nervous shock" as a certifiable medical disorder is doing as much harm among civilians as did "shell-shock" among soldiers in the last war.

Finally we may note that we do not expect to find neurotic disorders arising from illness from disease, nor do we hear of "post-operative neurasthenia." Yet, apart from the psychic factors, it is difficult to see why there should be any difference between disease and injury in this respect. Where, during convalescence, such symptoms do manifest themselves, it will, I think, again always be found that they are the result in injudicious medical suggestion or over-concern of relatives acting upon persons already of neurotic temperament.

Importance of the History

If the pathological difference between contusion and neurosis is the presence or absence of organic change the history of the incident becomes all-important. In cases presenting the post-concussional syndrome we expect to find, and do find in the great majority of instances, a history of injury to the head followed by a period of unconsciousness, the duration of which may be quite brief. A few of our patients presenting typical symptoms of contusion stated that they did not lose consciousness; but many of those bombed during air raids are dazed and confused at the time and can give no reliable account of what happened to them. C. P. Symonds (1941) states that the group of symptoms forming what he terms the "minor contusion syndrome" may follow injury to the brain without any loss of consciousness, and that their severity and duration have no constant relation to the degree and duration of the unconsciousness if it has occurred. In a few of our cases it was clear that the patient was not unconscious when first struck, but became unconscious after being rescued. Retrograde amnesia was almost always present. Many of the patients stated that their last recollection was that of doing something homely—"making a cup of tea" was often mentioned—and their next was that of finding themselves in hospital or in an ambulance on the way thereto.

On the other hand a large proportion of those who showed anxiety or other neurotic symptoms had sustained no physical injury at all, but had had terrifying experiences. Here is a typical case:

Mrs. A., a middle-class woman, was, previous to being bombed, apparently of normal mental make-up. In December last eight bombs fell in quick succession in the vicinity of her house, and a house two doors away was demolished. Some of the plaster fell from her ceilings and windows were broken, but she was not hit or cut or physically hurt in any way. She was, however, alone in the house and was terribly frightened. Later her husband came in, and in the morning they went together to see her doctor. He told her that she was suffering from "shock" and ordered her into the country at once. She returned in three weeks feeling no better. Examined at the end of four months, her most prominent symptom is terror, with an urge to micturate as soon as she hears an air-raid warning, and at times she has been unable to avoid wetting her clothes.

Other instances have been furnished by members of demolition squads or of fire services who, without having been physically hurt, have found themselves unable to face the terrors of their work. Some describe themselves as having "collapsed" while actually fighting fires or engaged in rescue work; others have carried on through the particular job but have found themselves sick and shaking the next day and have been unable to go back to duty. One man, who had worked for some months successfully as a member of a demolition squad, dated his symptoms from an occasion when, while working on one house, he was ordered to go to another building which had been destroyed, and found it was his own house and that his wife was buried in the ruins.

Some of the neurotic subjects had sustained cuts or burns or bruises, but there was not a single instance of one of them having also received a severe physical injury.

In estimating the psychic factors in these cases it must be remembered that all the three periods of suggestion of injury which, as we have seen, may play an important part in ordinary accidents are much accentuated in air raids. The antecedent period of terror may last for hours and may be very severe in those who have already once been bombed. After the crash, instead of the prompt help which is the rule in ordinary accidents, the injured person may be in a position of danger for a long time and his rescue may have to be effected while bombs are still falling and buildings are blazing. The person who is unconscious from the beginning is saved the last experience.

The Clinical Pictures

The clinical pictures in the two groups of cases, though superficially alike, are readily distinguishable in most instances. The outstanding feature in contusion is the headache, which is often associated with giddiness. The sufferers complain of it at once, and it may overshadow all other symptoms. They describe the pain as of a stabbing or throbbing character, or as being like that caused by a tight band round the head, and it is the essentially disabling factor in the condition, both for physical and for mental effort. In neurosis, on the other hand, headache is not a typical symptom. It may be complained of, but it is often mentioned only at the end of the story, almost as an afterthought, and it never has the prominence or the apparent severity of the headache met with in contusion.

Inability to concentrate is the other cardinal symptom in contusion, any mental effort tending to make the headache worse. This symptom is best elicited by encouraging the patients to talk freely about their daily affairs—what they do to pass their time, whether they help in the housework, etc. Nearly all will say that they cannot read more than the headlines in the newspapers, as reading makes the headache worse, the eyes sore, and the print become blurred. A characteristic feature is the forgetting to carry out small intentions. The sufferers go out intending to do something, but return without having done it. A woman trying to do shopping now finds she must make a list of the things she is going to buy. "I leave my change on the counter"; "I paid my fare in the bus and then offered it to the conductor again"; "I went to stay with a friend, and left all my luggage in the train," are other actual instances of this condition. The neurotic may complain of inability to concentrate, though if he uses these words he has probably heard the phrase; but when pressed to give specific instances he is often at a loss to find any. He becomes vague, and will make some such reply as, "Well, when I want to do anything." The contused person is often abstracted; the neurotic is usually too self-centred to leave his luggage in a train.

Another point of difference is that the victim of contusion takes a much more hopeful view of his future than does the neurotic. Contusion is an affection from which we expect recovery, and nearly all our contused patients stated that they felt definitely better than they had done a month or six weeks previously. The anxiety state, on the other hand, is a persistent disorder, and those suffering from it will rarely admit to improvement in so short a space of time.

Finally the general mental attitudes are different. The contused person goes straight to his major symptom—the headache. The neurotic is often vague. "It's my nerves," "I cannot explain myself," "I am a perfect wreck," are frequently his opening complaints; while others dilate at once upon their terrors during air raids. As they tell their life stories the differences in their personalities gradually reveal themselves. Many of the contused persons have led active vigorous lives and seem more concerned about getting back to their work than anything else. Two women ambulance drivers seen in succession were obviously minimizing their symptoms in the hope that they would be found fit to resume their duties. Those with anxiety states, on the other hand, belong to the "tender-minded" section of the community. Many of them show great courage in facing their difficulties, but much of this courage must be expended in overcoming an internal enemy from which their sturdier brethren are happily free.

The two groups described above comprise a large proportion of the total and are easily distinguishable, but a certain number of cases in which both sets of symptoms are present to a variable extent offer some difficulty in diagnosis. We have to remember, however, that a person already suffering from an anxiety state may sustain concussion, and the contused person may develop some of the indications of the excessive fear reaction now to be considered.

Influence of Fear

I have so far spoken of "neuroses" in rather general terms, but there is one condition presenting a very definite picture which calls for detailed consideration It was shown by a large proportion, certainly not less than two-thirds, of the cases classed as neuroses, and it was exhibited equally by men and women. These people start off at once by describing the terror they feel as soon as they hear an air-raid warning or gunfire. They begin to shake; some feel sick—"my stomach turns over" is a frequent description—and some even vomit; others have an immediate urge to micturate, and some have attacks of hyperidrosis. They cannot go on with their occupations; some feel impelled to rush out into the street; others run to the nearest shelter. At night they lie awake listening for warnings. Apart from these attacks of terror they have no complaints. Under examination they may show a tremor of the hands and eyelids and a somewhat quickened pulse.

Many of these people have led strenuous lives, often following occupations demanding judgment and "nerve," and no evidence of a neurotic tendency can be found in their personal histories. Their occupations have included lorry-driving and bus-driving, steel-erecting, tunnelling, plate-laying, shunting, etc., and important clerical and administrative work. The women have brought up families, run businesses, and held responsible jobs. They have carried on at their work until the incident occurred which affected them, and some express their profound shame at finding themselves in their present state. Here are two typical instances:

A man, married, with four children, served in France, Egypt, and Gallipoli in the last war. On discharge with the rank of sergeant he became a park-keeper in a London park and subsequently head park-keeper. He had a considerable staff under him and had important A.R.P. duties in the park, which he discharged satisfactorily until one night when a bomb fell near but did not physically hurt him. Since that date he has been unable to go on with his work as he cannot control his terror during air raids.

Another man served in France in the last war and had a good record. For twenty years he was a London bus-driver. In January of last year bombs fell near him, and he saw another bus wrecked and the driver blown to pieces. He cannot now drive in London, and has been placed in a quiet outlying district; but whenever he hears a warning he must go at once to the nearest urinal, and sometimes wets his clothes.

These people feel sure that they would be all right if they were transferred to a safe district, and there is every reason to believe that they will again become normal citizens after the war.

I do not think this condition should be regarded as a neurosis at all. It has not the deep-seated foundations of an anxiety state and is simply an accentuation of the normal response to threat of danger. The reaction caused by a physiological stimulus which is excessive or prolonged is apt to be re-evoked when the stimulus is repeated in much milder form or even when there is merely a threat of such repetition. Examples are not rare in compensation claims. A familiar instance is afforded by the workman who once having had a serious fall is afraid to work at a height again. A youth who rode a carrier cycle in the City recovered completely from a bad accident, with the exception that he dared not ride again in crowded traffic. Many persons are familiar with the condition in a minor form; speaking of a terrifying experience, they will say, "It makes me shudder to think of it again." Looking back, we can see now that many of the cases described as "shell-shock" in the last war fell into this category. These symptoms are really in the nature of conditioned reflexes, and we can postulate no more about their aetiology than that those who display them have a rather greater susceptibility to the fear stimulus than their fellow-men—a remark, however, which might be made about every form of disease. To describe this condition as anxiety neurosis, as ordinarily understood, is to suggest for it an aetiology for the existence of which there is no evidence. We require a term which shall simply define the condition without making any suggestion as to its fundamental origin, and none of our present names meet this need. "Commotional shock" and "emotional shock," terms used by Mott in the last war, have been recently revived; but the former seems to me to amount to concussion, and the latter to be our old friend "traumatic neurasthenia" under a new name. All these words carry implications with them, just as did "shell-shock." It would simplify the problem of handling these cases if they were lifted entirely out of the category of the neuroses; but this can never be done so long as they bear a designation indicating a neurotic origin. I have been accustomed to describe the condition in reports as "exaggerated fear reaction," which leaves the question of the aetiology entirely untouched; but a Greek cloak is kinder, and I suggest "hyperphobosis"* instead. The condition is not new. Job is our exemplar of withstanding adversity, yet he too felt it, and described it in the words: "In thoughts from the visions of the night, when deep sleep falleth upon men, Fear came upon me, and trembling, which made all my bones to shake. Then a spirit passed before my face; the hair of my flesh stood up." (Job iv, 13.)

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SULPHONAMIDE TREATMENT OF HYPOPYON ULCER OF THE CORNEA

BY

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The sulphonamide group of drugs have found a place in ocular therapeutics in this country, particularly in the treatment of ophthalmia neonatorum. Bellows and Chinn (1939) demonstrated that sulphanilamide penetrates to the ocular fluids and tissues in suitable and efficient therapeutic concentration when given by mouth, but not when applied topically. Luo and P'an (1940) obtained quite different results when they experimented on human eyes. Concentration in the aqueous after instilling 1% sulphanilamide was roughly the same as after oral administration. After applying the drug in powdered form the concentration in the aqueous was from five to eight times as great.

The present article is the record of a clinical experiment directed against a particularly destructive corneal condition—hypopyon ulcer. Because the pneumococcus is often the organism involved in the condition sulphapyridine was chosen as the chief though not the only weapon. The experiment began in June, 1939, with the use of sulphapyridine eye-drops as a 0.07% solution in saline isotonic with the lacrimal secretion.

* ὑπέρφοβος, "very fearful, timid" (Liddell and Scott).

The results were encouraging without being phenomenal. They were a little better than those obtained with the usual antiseptics or optochin and in a parallel series of cases treated by older methods. No eyes were lost either in experimental cases or in controls, except those that had been severely burned by molten metal. The cases treated with sulphapyridine drops had the advantage of quicker recovery and less dense scarring of the cornea. Several of the control cases failed to clear up or recurred, and were finally cured by administering sulphapyridine drops, in one case assisted by subconjunctival injection of the same solution. In a proportion of the cases sulphapyridine has been given orally instead of or in addition to the drops.

During the last few months a number of really severe cases have appeared, and it became evident that only by frequent instillation of the drops could the condition be prevented from deteriorating. A continuous drip was thought to be necessary to effect a cure, and this led to the use of sulphapyridine powder just as one uses calomel powder in phlyctenular ulcers. By this means 3 cases with purulent regurgitation from tear sacs were successfully healed; the tear sacs were subsequently removed—2 after healing of the cornea and 1 while healing was in progress.

Subconjunctival injections of soluseptasine (10%) have been given in a small number of cases in which there was no apparent discharge from the eye and conjunctival redness was moderate. One case—a typical serpiginous ulcer in a coal-miner, with early collection of pus in the anterior chamber—was given such an injection and the patient was allowed to go home—a risk one could never have taken in the past. Two days later the hypopyon had cleared and the ulcer had healed.

Accessory Forms of Treatment

In addition to the sulphonamide every case has had atropine drops and some form of cautery of the ulcer. It is true that some cases are cured by these means alone, but many eyes have been lost when these forms of treatment, aided by every art and antiseptic, have been carried out. It may be possible to omit cautery of the ulcer when using a sulphonamide: that and several other permutations and combinations of sulphonamide treatment remain to be tried.

Suggested Routine Treatment

In the light of experience so far gained the following is suggested as an outline of treatment, to be modified as further experiment may indicate:

1. The patient should as a rule be admitted to hospital.
2. A smear and culture are taken.
3. Atropine is an essential part of treatment, and cautery may prove to be so (see above).
4. In the absence of purulent discharge, possibly even with slight discharge, a subconjunctival injection of two or three depots of soluseptasine (10%) or sulphapyridine (0.07%), about five minims to each depot, should be given. Possibly stronger solutions of sulphapyridine may yet become available.
5. When the organism is known the appropriate sulphonamide treatment should be chosen. For the pneumococcus, sulphapyridine powder should be dusted lightly over the cornea three times a day. For a streptococcus, sulphanilamide powder may be used or soluseptasine continued as drops or by subconjunctival injection. For *Staphylococcus aureus*, sulphathiazole would seem to be the appropriate drug. It has been used in the form of drops in this experiment as 0.1% solution in 1.4% saline, but no definite opinion can yet be offered regarding its superiority over sulphapyridine.

Fine powder (200-mesh) causes no discomfort to the patient, though considerable conjunctival redness arises. So far the practice has been to precede the dusting by one drop of 1% decicaine. Any discomfort complained of has been relieved by removal of the pad and bandage. There is no need for this dressing unless the cornea erodes deeply and requires external pressure.

The total number of cases treated, apart from controls, is 41. Details of cases and comparative tables have not been given, as it is felt that brevity is preferable at the present time.

The two kinds of drops and the sulphapyridine powder were supplied by May and Baker, Ltd., to whom my thanks are tendered. My thanks are also due to the ophthalmic house-surgeons and nursing staff at the Guest Hospital and Eye Infirmary, Dudley, and to the matron and nurses at the Worcester City and County Eye Hospital.

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THE CALCULATION AND PRESCRIBING OF INFANTS' FEEDS*

II. THE NEONATAL PERIOD: PRACTICAL POINTS IN THE REGULATION OF FEEDS IN MATERNITY HOSPITALS AND HOMES

BY

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Many experienced sisters in maternity hospitals deal very successfully with feeding problems without the aid of any schedule of feeding, but their experience has to be bought at the price of many mistakes, and is not easily passed on to others unless it can be formulated in some general principles. At a time when many new maternity homes have been established in reception areas, and large numbers of newborn babies must be coped with by midwives with occasional help from a general practitioner, some practical suggestions may be helpful.

Routine of Feeding

Full-term babies are best put to the breast as soon as the mother has had some hours' rest after her labour—say about six hours after birth—and thereafter fed at regular intervals. But there is no object in keeping the baby at the breast for more than a few minutes at a time until the milk has "come in." Three-hourly feeding, giving both breasts at each feed until lactation is fully established, probably suits a larger proportion of newborn babies than a four-hourly routine, but against this must be set the greater amount of rest allowed to the mother by a four-hour interval. In any case nearly all normal babies can be started on five feeds in the day at four-hourly intervals before they are a month old. The time spent over a feed should never exceed thirty minutes and should seldom exceed twenty minutes. Many strong babies will soon take all they need in eight to ten minutes. Long feeds exhaust baby and mother and generally lead to an inadequate intake.

A common cause of lethargy and failure to suck is a subnormal temperature. When a lethargic baby develops slight oedema one can be fairly sure the temperature has fallen to a low level, perhaps on the previous day; moreover, if a baby shows little or no loss in weight after birth he should be examined for oedema. The keeping of a temperature chart for each baby in the maternity ward is strongly advised. Underfeeding, too, is often a cause of lethargy and poor sucking, and hence may establish a vicious circle; but every lethargic baby merits

*Part I of this paper appeared in last week's issue at page 841.

careful consideration, as failure to suck satisfactorily is a symptom in many pathological conditions in the newborn, including intracranial trauma. Midwives are generally familiar with the necessity for having mother and baby in a comfortable position during feeds and with the fact that in the early days many babies need gentle encouragement to suck, and know that if the breast is hard and yields with difficulty manual expression may be temporarily necessary.

Quantitative Requirements during the First Ten Days of Life

Daily weighing of the newborn baby is much to be desired in order to ascertain his progress. If a breast-fed baby is making satisfactory progress and showing normal vigour it is unnecessary to attempt to regulate his intake, as he will do this quite well for himself. Test feeds are desirable, however, if he is not sucking well, if he is not gaining weight fairly steadily from 3 days old, if he loses more than, say, 8% of birth weight (or about 1¼ oz. per pound birth weight), or if he vomits or passes an excessive number of stools. If accurate scales are not available a rough estimate of the day's intake may be made by expressing and measuring the whole of some feeds.

I have suggested a formula based on the baby's birth weight whereby an approximate estimate can be made of the calorie requirements for the first ten to fourteen days of life (Mackay, 1941). On the seventh day (6 days old) and during the second week of life the requirement for twenty-four hours is assumed to be 50 calories per pound birth weight. This calorie allowance is divided by 7, and, on the first day of life the baby is allowed 1/7 of 50 calories per pound birth weight, with an increase of the same amount daily until 6 days old. On this basis a baby by the second week of life would receive 2½ oz. of breast milk per day per pound birth weight. A premature baby doing well and seeming hungry would be allowed more by the end of the second week, all increases being made gradually. As an example, a baby 4 lb. at birth should, according to the formula, have 200 calories on the seventh and subsequent days, or, in order to have a figure divisible by 7, let us say 210 calories; during the first day he would receive 30 calories, or 1½ oz. of breast milk, and this would be increased by 30 calories daily till he reached 210 calories, or 10½ oz. of breast milk, daily at 6 days old. This formula has been shown to give good results with hand-fed premature babies, but it must be remembered that most of the hand-fed premature babies were started on human milk from another mother. The normal full-term baby, however, fed on the breast, and making normal progress, gets considerably less than the formula requirement during the first two days of life, but after that period his average intake is somewhere around that shown by the formula, with large individual variations resulting probably in part from variations in the calorie value of colostrum and early breast milk (Langstein, Rott, and Edelstein, 1913). If it is known that a mother cannot feed her baby, and that consequently he has to be hand-fed from the outset, he may be fed in accordance with the schedule from the first day if breast milk is available. A rather slower start is generally necessary if he is wholly artificially fed, and no harm is done by giving water only to a healthy full-term baby during the first twenty-four hours if so desired.

Calorie-Value of Colostrum and the Use of "Standard" Mixtures of Artificial Feeds

For practical purposes the round figure of 20 calories per fluid ounce can be taken as the average calorie value of colostrum and early breast milk, like that of milk after lactation is established. The differences between individual samples may be large, particularly during the first few days after parturition, and it is said that on the first day the calorie value of colostrum may even be double the average value for breast milk (Langstein, Rott, and Edelstein, 1913). On this ground it would seem illogical if artificial feeding has to be adopted, to give the newborn infant dilute feeds of low calorie concentration. In practice it is found that if this is done the baby is apt to receive an insufficient amount of food because he tires before he has taken the large bulk necessary. Babies from the first day of life can usually take and tolerate feeds of suitable character with a calorie value of 20 per fluid ounce, provided the quantities are carefully graded; and when artificial feeds have to be given I strongly advocate the use of "standard" mixtures of this calorie value (see Part I, p. 842), whatever the infant's birth weight. The quantity of artificial food must always be carefully graded, however, with no sudden large increase. For example, if till the fourth day of life the infant has been put to the breast but has obtained little food he should start with a small supplement, and not suddenly receive the full allowance given in the schedule of feeding for this age, or an upset and a loss of weight are risked. As to the character of the feed, I suggest for premature and feeble babies sweetened condensed milk, 1 in 5 by volume, and for vigorous full-term babies half-cream dried milk with sugar—either the powder already sweetened by the manufacturer and containing about 27% of the calories in added lactose, or unsweetened milk powder to which sugar must be added when the feed is mixed. If these are not available, and full-cream dried milk must be used, a large proportion of the food must be given as added sugar in order to render it as easily tolerated as possible. Of the calories ordered 50% may be in the form of added sugar, in which case the feed would consist of equal volumes of "standard" dried milk mixture and "standard" sugar solution. But the use of full-cream dried milk entails a careful watch for any symptoms of digestive disturbance which necessitate reduction of intake. Since roller-process dried milk with its poorly emulsified fat must always be freshly mixed with water for each feed, the quantity mixed will often have to be in excess of that required for a very young baby, since it is impossible to measure fractions of a drachm of dried milk with any semblance of accuracy. In the case of premature and feeble babies no artificial feeds can approach the results achieved with breast milk.

Vitamin and Mineral Adjuncts

Vitamin D in some form should be started as soon as the baby is well established on his full calorie requirements, except during the summer, when it need not be given to full-term babies lying out of doors daily. Vitamin C should be started next, and it is desirable that all babies, breast-fed and bottle-fed, should receive an iron supplement from about 2 till 12 months or more old.

The Use of Feeding Tables: (a) For Full-term Babies

The use of feeding tables, such as those here given, saves time and trouble in repeated calculations, and in a maternity hospital such tables hung in the ward kitchen will do much, provided they are intelligently used, to keep the feeding on the right lines. It is assumed that all foods given provide 20 calories per fluid ounce. In Table I are shown the volumes of food, according to the schedule, required for babies of different birth weights for each of the first seven days of life. The total for each twenty-four hours is given and also the volume required in each feed, according to whether five feeds or six are taken in the day. For breast-fed babies such a schedule is chiefly of use from 3 days old and onwards for checking the intake if they are not making normal progress, and should prevent mistakes in diagnosis between overfeeding and

TABLE I.—*Scheme of Feeding for the First Seven Days of Life (Quantities to Nearest Quarter-ounce)*

Age:	1st Day of Life	2nd Day of Life (1 Day Old)	3rd Day of Life (2 Days Old)	4th Day of Life (3 Days Old)	5th Day of Life (4 Days Old)	6th Day of Life (5 Days Old)	7th Day of Life (6 Days Old)
Fraction of 2½ oz. per lb. birth weight	1/7	2/7	3/7	4/7	5/7	6/7	7/7

Birth Weight lb.	In 24 Hours	Per Feed		In 24 Hours	Per Feed		In 24 Hours	Per Feed		In 24 Hours	Per Feed		In 24 Hours	Per Feed	
	oz.	5 f. oz.	6 f. oz.	oz.	5 f. oz.	6 f. oz.	oz.	5 f. oz.	6 f. oz.	oz.	5 f. oz.	6 f. oz.	oz.	5 f. oz.	6 f. oz.
5	1¾	(1)	1	3½	(3)	1	5¼	(1)	1	7	(1¼)	1	9	(1¾)	1
5½	2	(1)	1	4	(3)	1	6	(1¼)	1	7¾	1	1	9½	(2)	1
6	2¼	1	1	4½	1	1	6½	1¼	1	8½	1	1	10¼	2	1
6½	2½	1	1	5	1	1	7	1¼	1	9	1	1	11	2	1
7	2¾	1	1	5½	1	1	7½	1¼	1	9¾	1	1	11¾	2	1
7½	3	1	1	6	1¼	1	8	1½	1	10½	1	1	12¾	2	1
8	3¼	1	1	6½	1¼	1	8½	1½	1	11¼	1	1	13½	2¼	1
8½	3½	1	1	7	1¼	1	9	1½	1	12	1	1	14¼	2¼	1
9	3¾	1	1				9½	1¾	1	12¾	1	1	15¼	2¼	1
9½	3¾	1	1				10¼	2	1	13½	1	1	16	2¼	1
10	3¾	1	1				10¾	2	1	14¼	1	1	16¾	2¼	1
Per lb. birth weight ..	Calories 7			Calories 14			Calories 21			Calories 29			Calories 36		

Birth Weight lb.	In 24 Hours	Per Feed		In 24 Hours	Per Feed		In 24 Hours	Per Feed	
	oz.	5 f. oz.	6 f. oz.	oz.	5 f. oz.	6 f. oz.	oz.	5 f. oz.	6 f. oz.
5	10¾	(2½)	2	12¾	(3)	2	14¾	(3½)	2
5½	11¼	(2½)	2	13¼	3	2	15¼	3½	2
6	12¼	2½	2	14¼	3	2	16¼	3½	2
6½	13¼	2½	2	15	3	2	17¼	3½	2
7	14¼	2½	2	16	3½	2	18¼	3½	2
7½	15¼	2½	2	17¼	3½	2	19¾	3½	2
8	16	2½	2	18¼	3½	2	20¾	3½	2
8½	17	3	2	19¾	4	2	21¾	4	2
9	17¾	3½	2	20¾	4½	2			
9½				21¼	4½	2			
10									
Per lb. birth weight ..	Calories 43			Calories 50					

The volumes shown in this table are based on the assumption that all feeds given provide about 20 calories per fluid oz. Normal breast-fed babies take less than the quantities shown on the first and second days of life. No breast-fed baby progressing satisfactorily should be given a supplement. Babies wholly artificially fed should have a rather slower rate of increase than that here shown.

underfeeding—mistakes which are not infrequent. The figures for the first three days can be used for the prescribing of feeds for babies who have to be hand-fed throughout, though if no breast milk is available the increase should usually be rather slower than that shown in the table. It should be carefully explained to nurses that it is not desired to adhere to any schedule rigidly, that in the first two or three days of life normal breast-fed babies do not take the quantities shown in the table, and that babies making normal progress on the breast should certainly not receive supplements up to this schedule; also, as artificial feeds are less easily tolerated than the breast, supplements should always be started gradually.

The ordering of supplements for breast-fed babies in the first ten days of life involves various considerations. Generally speaking, a baby losing weight after the third day on account of underfeeding should have a supplement, but to this there are many exceptions. Some lethargic babies, when given supplements, tend to suck the breast less vigorously; but more commonly lethargy is increased by keeping the baby underfed, and vigour and sucking improve with the giving of a supplement. Great care must be taken to ensure complete emptying of the breasts, and if the baby does not do this with gentle encouragement they should be emptied by hand. If a mother lacks confidence in her ability to feed her baby this may be a reason for avoiding supplements when possible. Big babies, weighing 8½ lb. and more at birth, often require temporary supplementing of their feeds until the breast secretion adjusts itself to their larger needs. An infant should not be discharged from hospital or pass to the mother's unaided care while he is underfed. A mother finding that her underfed baby is "not getting on" often abandons breast-feeding in the second fortnight after parturition, whereas, with a temporary supplement, full breast-feeding could often be resumed. If a supplement is given, the mother's co-operation should be sought in reducing and omitting it, if and when possible. Statistics showing a high proportion of babies discharged from hospital wholly breast-fed are valueless unless it can be shown that the babies were getting enough food.

(b) For Premature Babies

Table II sets out a schedule of feeding for premature babies, calculated from the formula. Some such table is essential in a busy maternity ward, as the time consumed in calculating each day's feed for each premature baby is wasteful, and mistakes are likely to be common. Here again the table is intended as a guide only: a baby wholly

TABLE II.—*Scheme of Feeding for Premature Babies in the First Week of Life*

Weight at Birth	Food by Formula: On 7th Day Calories	On 7th Day Oz.	In 7 Days Calories	Daily Increase Calories	Daily Increase Oz. (approx.)	Daily Feeds: Number × Volume in Drachms (Calories in Parentheses) 1st Day	2nd Day 1 Day Old	3rd Day 2 Days Old	4th Day 3 Days Old	5th Day 4 Days Old	6th Day 5 Days Old	7th Day 6 Days Old	Food in 7 Days (Oz. and Calories)
2 lb.	100	5	400	14	¾	12×½=6 (15)	12×1=12 (30)	12×1½=18 (45)	12×2=24 (60)	12×2½=30 (75)	12×3=36 (90)	12×3½=42 (105)	21 (420)
2¼ ..	125	6¼	500	18	1	12×½=6 (15)	12×1=12 (30)	12×1½=18 (45)	12×2=24 (60)	12×2½=30 (75)	12×3=36 (90)	12×4=48 (120)	24¼ (495)
3 ..	150	7½	600	21	1	12×1=12 (30)	12×1=12 (30)	12×1½=18 (45)	12×2=24 (60)	12×2½=30 (75)	12×3=36 (90)	12×3½=42 (105)	30½ (610)
3½ ..	175	8¾	700	25	1¼	12×1=12 (30)	12×1=12 (30)	12×1½=18 (45)	12×2=24 (60)	12×2½=30 (75)	12×3½=42 (105)	12×4=48 (120)	35 (720)
4 ..	200	10	800	29	1½	10×1½=15 (37)	8×2=16 (40)	10×2½=25 (62)	7×4=28 (70)	12×3=36 (90)	12×3½=42 (105)	8×6=48 (120)	41¾ (825)
4½ ..	225	11¼	900	32	1½	8×2=16 (40)	8×2=16 (40)	7×5=35 (87)	7×6=42 (105)	12×4=48 (120)	8×6=48 (120)	7×8=56 (140)	45 (885)
5 ..	250	12½	1,000	36	2				7×7=49 (122)	8×6=48 (120)	7×8=56 (140)	7×9=63 (157)	49 (980)
5½ ..	275	13¾	1,100	39									55¾ (1,113)

All feeds to provide 20 calories per fluid ounce. Supplements providing vitamin D and vitamin C should be started cautiously as soon as the baby is established on his feeds, and iron should be started before he is 2 months old.

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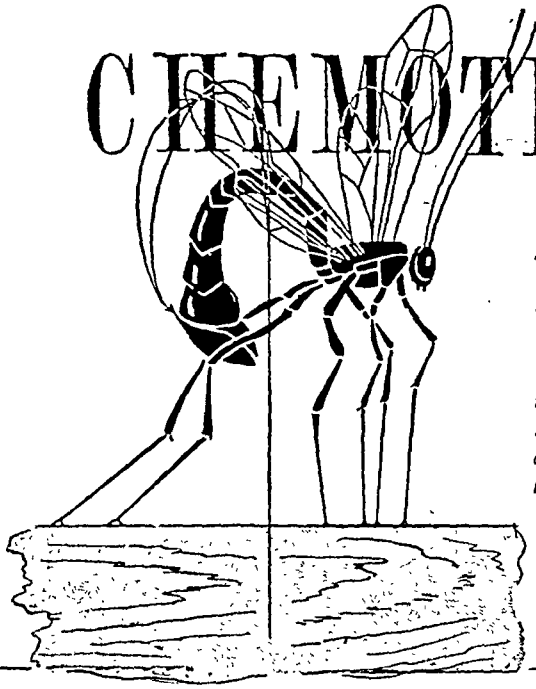
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—vide *Lancet* 1937, **2**, 1237.

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artificially fed, or one who takes unwillingly and is inclined to vomit, or who has some abdominal distension, must have a slower increase; a baby obviously hungry and progressing well on breast milk may have the quantities telescoped, so that he receives 50 calories per pound birth weight by the sixth or even the fifth day. Whether the calorie allowance for the day is divided into a smaller or a larger number of feeds must depend on how easily the feed is taken. Abdominal fullness is probably the commonest early sign that the baby is getting rather more than he can well tolerate.

Many small premature babies have temporarily to be fed with pipette or spoon, or possibly with an oesophageal tube. Often administration of carbon dioxide and oxygen through a double nasal catheter for five to ten minutes before feeds increases depth of respiration, brings about better expansion of the lungs, and thereby increases the baby's vigour and his ability to suck. As premature babies are particularly likely to suffer from dietetic deficiency, vitamin D, vitamin C, and iron should be given early and regularly.

Extra Fluid

Some extra fluid over and above that contained in the feed is essential if the best results are to be obtained and inanition fever avoided. A full-term baby taking from the breast requires water given regularly for the first three to seven days, and continued thereafter if the baby takes it readily, as he probably will in hot weather or if living in a very warm room. The quantity will depend largely on the baby's desire to take, but should generally amount to 3 oz. to 4 oz. daily from the second to the fourth or fifth day of life. In my opinion it is undesirable to give sugar in the water.

Premature babies for the first five days of life should, if possible, be given extra water amounting to about as much as they get in their feeds: as the size of the feeds increases the amount of extra water can be decreased. This water is better given between rather than in the feeds, as big bulks are more likely to be vomited, and as it is undesirable to let the food allowance drop because the baby tires before he takes the whole of a large volume of fluid.

Day Sheets

If the best results are to be attained with premature and feeble babies full records are essential. For this purpose it is desirable to supply the nurses in maternity wards with ruled sheets for each infant, on which to record in columns hour by hour anything of importance. The records should include the quantity of food taken at each feed; extra fluid given, and its amount; each stool, and if abnormal its size and consistency; all vomits; the temperature record, if possible four-hourly; the baby's weight at the same time each morning; and any symptoms noted.

Discharge of Babies

If it can possibly be avoided babies should not be discharged from hospital and maternity homes underfed or until they are making satisfactory progress. They should be having not more than six feeds in the day: night feeds mean insufficient sleep for the mother. The conditions to which a baby is going should be inquired into: is the house intact?; will he be sleeping in a wet Anderson shelter or under a railway arch?; is there infection in the home?; can the mother obtain any needful artificial food at once, and are her financial circumstances such that she is entitled to obtain free milk for herself and the baby? The mother should herself have fed and washed the baby before discharge and have mixed any artificial feeds being given, so that she can undertake these things with confidence in her own home. If possible, the premature baby should be getting its full requirements of vitamin D, vitamin C, and iron before discharge, so that the feeding may be something like plain sailing for the mother.

Summary

The routine feeding of newborn babies is discussed, and a formula is suggested whereby their approximate daily calorie needs can be calculated. The advantages are indicated of standardizing artificial feeds so that they contain 20 calories per fluid ounce. Feeding tables are given whereby the food of babies in the neonatal period can be ordered or checked, and indications for supplementing the breast milk intake are discussed

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Medical Memoranda

An Unusual Sign in Fractured Skull

The following case may be considered worthy of record on account of its rarity.

CASE REPORT

A man aged 45 was admitted to hospital with a history of having fallen off a bus twenty minutes previously. He was semi-comatose, restless, and incoherent. The pulse rate was 100 and the blood pressure 120/80. The pupils were equal and active. Movement of limbs was apparently full. Babinski's sign was absent. There was bleeding from the left nostril, and he vomited once soon after admission.

Two hours later he was conscious and showed retrograde amnesia, remembering nothing after waiting for the bus. He complained of headache only. Lumbar puncture produced pure blood only Radiographs revealed a fissured fracture of the occipital bone running down from the foramen magnum to the right of the middle line. Forty-eight hours after admission there was "oedema" of the whole scalp, with pitting on pressure. The swelling extended from occiput to sinciput, but did not spread beyond the supra-orbital ridges. There was no scalp wound, no obvious haematoma, and no localized inflammatory swelling such as is seen in Pott's puffy tumour. Twenty-four hours later the oedema had gone. He now complained of dimness of vision of the right eye, and investigation disclosed a complete vitreous haemorrhage with absence of the red reflex. The left fundus showed swelling of the nerve head to the extent of about 2D

Lumbar puncture sixteen days after admission revealed clear fluid with no abnormal features except a stronger Fehling reaction. By this time there was a slight return of the red reflex on the right side with some corresponding return of vision, and the swelling of the left disk was subsiding. The headache improved slowly, and on discharge after seven weeks the patient did not complain of anything except slight giddiness and defective vision in the right eye.

DISCUSSION

The only similar case record found in the literature is that of a child reported by Gottlieb (*Medical Record*, 1935, 142, 511), in which with a fracture of the occipital bone there was a progressive swelling of the scalp and face attributed to an escape of cerebrospinal fluid extending into the subaponeurotic tissues from the epicranial space and thence to the subcutaneous tissues Gottlieb suggests the name "cephalhydroma" or "extracranial hydrocephalus" for the condition. He was able to show radiographic evidence of fluid beneath the scalp, and though this proof is missing in our case it would seem likely that the condition is of the same nature.

P. N. CUTNER, M.B., F.R.C.S.Ed.

London, W.1. W. LEES TEMPLETON, M.D.

J. Parks (*Amer. J. Obstet. Gynecol.*, 1941, 41, 714), who emphasizes the rarity of true diphtheritic vaginitis in the adult, records a case of isolated diphtheritic vaginitis in a woman aged 22. The diagnosis at first made was acute bartholinitis and secondary syphilis, until the patient passed a cast of the vagina in which virulent diphtheria bacilli were found. Rapid healing followed injection of diphtheria antitoxin. Generalized constriction of the vagina ensued.

Reviews

WILFRED TROTTER'S WRITINGS

The Collected Papers of Wilfred Trotter, F.R.S. Oxford Medical Publications. (Pp. 194. 10s. 6d. net.) London: Oxford University Press. 1941.

In every profession there is often a striking discrepancy between the popular estimate of a man and the opinion held of him by his colleagues. Of this Wilfred Trotter was an outstanding example. Too little known by the outside world, he was regarded in the profession as having perhaps the finest mind in twentieth century British medicine. The more closely men were associated with him the greater was their admiration, sometimes reaching " this side idolatry." For his great gifts were equalled by his high character. The unusual combination of the mind of a philosopher with the hands of a surgeon gave him a singular intellectual poise, wisdom, and breadth of view. The publication of his *Collected Papers* is therefore timely and most welcome. Those who heard his Hunterian Oration will be glad to recapture the spell of that occasion, remembering the fascinated audience in the crowded theatre to whom he said, " Nothing brings more certain conviction of a man's death than his memorial. . . . No piety after their death can equal in effectiveness a receptive and sympathetic understanding [of great men] during their lives." In that respect he was fortunate in his own lifetime.

In addition to valuable neurological studies this book gives the clue to his general outlook, which we will endeavour to summarize. He held that at no time in the history of the intellect has the sanitary work of destructive criticism been more needful, yet he succeeded in making this both illuminating and inspiring. The instinctive reaction against a novel idea he explained as due to a subconscious feeling that a new truth involved a threat to the personality. To him a medical career appeared desirable because it is possible in it " to pursue the dying ideal that an occupation for adults should allow of intellectual freedom, should give character as much chance as cleverness, and should be subject to the tonic of difficulty and the spice of danger." It is a practical art, and although we must trust to the laboratory rather than to mere observation for further advances in it, " the affectation of scientific exactitude in circumstances where it has no meaning is perhaps the fallacy to which medicine is now most exposed." " A practical art which pretends to be applied science does not thereby show itself to be progressive, it only shows itself to be quackery." " The exactitudes of science call for the elimination of human faculty as far as possible; the lack of exactitude in the practical art calls for the use and expansion of human faculty as far as possible." Yet, he maintains, we cannot trust to the intellect alone, for psychology has shown that it is after all no more than a human organ with preferences and caprices like the stomach.

The consequences of the confident and uncontrolled use of reason in medicine have been gloomy enough; applied to the general affairs of life the results have been even more dreadful. Guided by such master hands as Aquinas, Calvin, Hegel, and Marx, the intellect has shown itself more deadly than cholera or bubonic plague and far more cruel. Philosophy has been cultivated by many of the ablest minds. " It has evolved innumerable systems each rationally proved by its founder to be true and all inconsistent with one another. An experiment that has gone on failing for 2½ millennia may well make us wonder whether the apparatus is adequate or the method sound." It is not surprising therefore that in recent days we are sometimes advised actually to abandon the use of reason; but this is more often founded on a dislike for its conclusions than on doubts of their validity. Reason is an instrument which is powerful but awkward to handle; like any other instrument it is subject to error. We have to learn how to " calibrate the intellect " for the contemplation of ordinary experience. This problem, his son tells us in a brief introduction, occupied Wilfred Trotter's mind in the last years. If his health had permitted him to elaborate his ideas for making the human mind an instrument of greater practical use it might have proved his most considerable achievement.

It is impossible in this summary to convey an adequate sense of his clarity of thought and beauty of expression. To watch Wilfred Trotter's mind in action was a humbling yet salutary and even exhilarating experience. We may apply to himself the words he used about John Hunter: he worked " faithfully, in purity of heart, and with utter devotion to truth."

INDUSTRIAL MEDICINE

Outlines of Industrial Medical Practice By Howard E. Collier, M.D.Ed., Ch.B. (Pp. 440. 21s. net.) London: Edward Arnold and Co.

To those who are engaged in industrial medical practice it becomes more and more apparent that as a branch of medicine it has become so comprehensive that it cannot be covered adequately by the experience of any one person. The author of this book, however, has valiantly attempted by himself to cover the whole of the subject, and this has inevitably led to some inequality of treatment. The subjects discussed are grouped under the headings of executive duties, advisory functions, industrial psychology, industrial medicine, and industrial forensic medicine. In some parts the book shows evidence of a lack of first-hand experience of industrial medical practice. For example, the Thomas splint is advocated as the best method of treating lower limb fractures by first-aid workers in the ambulance room, and the author proposes that all workers found to have a temperature of 98.6° or over should be sent home; in neither instance is this advice practical. The statement that medical examination of new entrants produces a fall in labour turnover in almost all factories is misleading; and is the author on safe ground in recommending that industry should supply vitamins for night workers? The chapter on industrial psychology does not make a difficult part of the subject very much easier for the reader. The section on industrial diseases is the best part of the book, which concludes with a summary of the various Acts applicable to industrial medicine.

SURGICAL PATHOLOGY

A Textbook of Surgical Pathology. By Charles F. W. Illingworth, M.D., Ch.M., F.R.C.S.Ed., and Bruce M. Dick, M.B., F.R.C.S.Ed. Fourth edition. Churchill's Empire Series. (Pp. 728; 300 illustrations. 35s.) London; J. and A. Churchill, Ltd. 1941.

Although the medical student is not of necessity the best judge of a good textbook, yet he has a very shrewd idea of its general teaching value, and if a book reaches a fourth edition in less than ten years it may be accepted that it must at least offer what the student requires. This is certainly true of Illingworth and Dick's *Textbook of Surgical Pathology*, of which a fourth edition has appeared: but, in addition, quite apart from the student's point of view, this volume is recognized as an excellent exposition of the subject.

A book intended primarily for students should be clearly written in good language, free from ambiguity, well illustrated, and, above all, the balance between the various sections and between different views of any one subject must be fairly held. Judged by all these standards, this

textbook emerges with flying colours. We have tested the information provided by reference to many subjects, new and old, over the whole range and always found a completely satisfying account, free of verbosity but not unduly skimped. The proportionate space devoted to different subjects has obviously received very careful attention, so that while the rare conditions receive a short notice there is no tendency to overload the book at the expense of more important aspects of surgical pathology. This careful balance is one of the outstanding features of the book; it is doubtful if the authors' judgment in this respect could be improved.

There are some 300 illustrations, mostly of high quality, but if one were searching for criticism it could be that some of the radiographs have not reproduced very clearly, a widely recognized difficulty which can be overcome only by the use of full art paper with all its attendant disadvantages. The general production of the book reaches the usual high standard of Churchill's Empire Series. We feel no hesitation in recommending it to the student, and to the surgeon who wishes to brush up his knowledge and to obtain a balanced statement on the new aspects of the subject.

HUMAN EMBRYOLOGY

Developmental Anatomy: A Textbook and Laboratory Manual of Embryology. By L. B. Arey, Ph.D., Sc.D., LL.D. Fourth edition, revised. (Pp. 612; illustrated 35s. net.) Philadelphia and London: W. B. Saunders Company. 1940.

The fourth edition of Arey's *Developmental Anatomy* is described by its author as "essentially a new book." It is well and very fully illustrated, and it covers within the limits of 612 pages nearly the whole field of human developmental anatomy, with in addition a valuable series of illustrations of sections and models showing some of the most important stages of development in chick and pig embryos. At the end of each chapter there is appended a valuable list of references to literature. This, though by no means complete, is sufficiently full to enable the reader to find further and more detailed information on special subjects.

The work regarded from the standpoint of medical or science students is certainly one of the best textbooks on human embryology. One misses, however, much interesting matter, which is dealt with more fully in some of the older textbooks, more especially the practical details which are necessary from the clinical standpoint in order to understand fully and to treat congenital defects of such parts as the lips and palate, the spinal cord and the vertebral column, and of special organs or systems such as the eye or uro-genital apparatus. Also from the biological standpoint this work lacks much of the interest that is inspired by some of the earlier works, which by a few words of reference to comparative anatomy or comparative embryology whet the appetite for further information and extended study. As a well-ordered, dogmatic exposition of the facts of human embryology this book forms, however, a masterly survey of recent work on embryology which deserves the highest commendation, and it will be of great value both to students and to research workers.

Notes on Books

The outstanding success of Dr. A. E. HERTZLER'S *Horse and Buggy Doctor* has encouraged him to embark on the admittedly risky enterprise of a sequel. His title, *The Doctor and His Patients* (John Lane, 12s. 6d.), is rather misleading, because, as he tells us in his preface, the book deals with one aspect only—the complications of marital and family relationships. His outlook has been largely conditioned by the loss of a much-loved daughter, which has led to a highly protective attitude towards children and adolescent femininity. That the well-ordered life of a family united by love is the most satisfactory state in the world is true; that it is difficult to attain, these pages amply testify. The author is obviously well-meaning and sincere, and much, though not all, of his advice is sensible. Most medical men have had unpleasant patients, but Dr. Hertzler seems to have specialized in them. To his question, "Why are allegedly Christian people so interested in the sordid things of life?", we would reply by another—Why publish 316 pages chiefly devoted to their description? Repetition becomes wearisome and blurs the intended effect. It may be urged that he knows his public and the way in which to impress them. Some people may like the discussion of the most delicate topics in language reminiscent of Damon Runyon. We don't.

Notwithstanding all the difficulties of to-day in Britain, *The Public and Preparatory Schools Year Book* for 1941 has made its appearance in customary size and shape, and is published by H. F. W. Deane and Sons at 10s. 6d. This reference work, invaluable to schoolmasters and parents, has served its public for fifty-two years. The new edition records the moves, necessitated by the war, of twenty-nine public schools and 100 preparatory schools to temporary addresses. Besides authoritative information about all the public schools represented on the Headmasters' Conference or belonging to the Association of Preparatory Schools, whose official book it is, the volume contains particulars about the universities and guidance on careers, including useful notes on the medical and dental professions.

Preparations and Appliances

SCREENING CUBICLE FOR SHORT-WAVE DIATHERMY

Before the war short-wave diathermy was finding an increasing application in medicine. There was some complaint that the apparatus used interfered with radio reception, especially television, but efforts were being made to find a solution of the difficulty. A short-wave apparatus radiates energy over considerable distances and any radio receiver adjusted to its frequency can pick it up. With the outbreak of war the expected interference of these sets with the radio communications of the Services led to the promulgation under the Defence of the Realm Regulations of the Control of High Frequency Apparatus Order, which applies to "any apparatus that generates or uses and has a maximum output exceeding 10 watts at a frequency exceeding 10,000 cycles per second, not being wireless transmitting apparatus." Thus the possession of diathermy apparatus, both long and short wave, valve-operated or of the spark-gap type, was restricted to approved hospitals and similar institutions and made conditional upon the provision of screening in accordance with official specifications. Details of screening methods have been published by the Engineering Department of the G.P.O. (Radio Branch).

In some circumstances the screening of a whole room, with a supply of filters for every electrical circuit, may be expensive and difficult. Philips Lamps Ltd. of Century House, Shaftesbury Avenue, W.C.2, have constructed a cubicle which complies with the G.P.O. instructions. It can be of any size, but a convenient one will be 6 ft. in each dimension. It is constructed of sheet metal and 1/4-in. wire gauze. If the cubicle is required to stand in the corner of a room the two sides against the wall may be made entirely of sheet metal instead of sheet metal in the lower half and wire mesh in the upper, the panel arrangement minimizing the wire cage effect. The mains suppression filter and the metal-sheathed lead to the plugs are provided, and the door is of wire gauze with two locking handles to give good contact. There is room in the cubicle for massage couch, chair, apparatus, and the necessary movements of the operator. The cubicle is sectional, so that it can be easily dismantled and re-erected or additional sections added to permit it to contain more than one apparatus.

The screening cubicles can only be supplied to recognized hospitals or institutions which can quote the number of their permit from the Engineering Department of the G.P.O., and the restriction upon possession by private practitioners of high-frequency apparatus still holds good.

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ELIMINATING USE OF SURGICAL SPIRIT

We referred not long ago[1] to the impulse which has arisen to overhaul aseptic and antiseptic technique. Preventable sepsis has repeatedly been attributed to defects in time-honoured methods of sterilization, and war surgery, both by its very nature and owing to conditions in which it is sometimes conducted in improvised hospitals, has provided a field in which the effects of imperfect technique soon become abundantly manifest. Although war has magnified the problem for us, it exists under normal conditions and has recently caused much concern in the U.S.A.; the text of our previous editorial was the report of a Congress of the American College of Surgeons at which methods of sterilization and their improvement were discussed from many standpoints and for several days. A remarkable feature of this report was the extraordinary diversity of method employed for sterilizing instruments, and the principal speaker drawing attention to this urged the College whose members he was addressing to undertake the official standardization of satisfactory measures for this purpose. Sterilization technique has hitherto been left too much to the discretion of nursing staffs in theatres and elsewhere, and although some of their traditional methods are open to criticism, these have been so long established that they will not readily be changed without the backing of wide authority.

It sometimes happens that an overdue reform is precipitated by unforeseen circumstance, and that circumstance has arisen with us in the form of an acute shortage of spirit. The supplies of alcohol, and indeed of all other solvents and substitutes for it, are low, and consumption for surgical purposes will have to be drastically reduced forthwith. The War Wounds Committee of the Medical Research Council has therefore considered in some detail the measures which can be taken to economize in the surgical use of spirit, and as spirit is extensively used in various ways for purposes of sterilization, the efficacy of alternative methods has also had to be considered. This situation has in fact called urgently for decisions on matters which have been the subject of leisurely debate and varied practice for many years. Not only have these matters been discussed, but where information was incomplete or any doubt existed actual tests have been carried out in order to verify the efficiency or feasibility of a proposed method. The conclusions reached are embodied in a memorandum which has now been sent to the heads of medical services throughout the country, and instructions based on them will presumably be issued soon to hospital personnel.

Spirit is used in surgery for three main purposes. One of these is the sterilization of instruments, and this practice is condemned in unqualified terms. No one acquainted with publications on this subject even during the past few years can logically dispute this judgment. Pure spirit is a poor disinfectant, by no means always sterile itself, and even when diluted with water to its optimum strength for disinfectant action—at which it rapidly rusts instruments stored in it—it is incapable of penetrating even the thinnest film of material such as blood, and is, of course, powerless in any circumstances to attack spores. It is recommended in this memorandum that instruments should be sterilized by heat: dry heat, if available, is the ideal method for any instrument composed only of steel or glass; the alternative for most is boiling, and it is suggested that whenever possible instruments should be sterilized by boiling immediately before use. Two important pronouncements are made in connexion with this method. The first is that boiling for five minutes in a 2% sodium carbonate solution is lethal to all types of bacteria, including spores. Statements to this effect have been made in the past, but we have authority for saying that these have been verified by stringent tests conducted in this country on behalf of the Medical Research Council within the past few weeks. The second is that "recent tests, as well as the experience of many surgeons, have indicated that the widespread view that boiling blunts the edges of surgical knives has little or no foundation." It is pointed out that scalpels must be protected from damage by contact with other instruments during boiling, either by the use of a separate rack or by wrapping them in gauze. A further purpose for which large amounts of spirit are used is the storage of instruments already sterilized by other means. It is suggested that these may often be placed dry in covered trays or sterile towels, or, alternatively, stored in a watery solution of formalin to which borax is added to prevent rusting.

Another wide and debatable field covered by these recommendations is application to the skin. The large bowls of spirit sometimes provided in operating theatres are more wasteful in proportion to their usefulness than any other use to which spirit is put, and are to be prohibited. The main object of immersing the hands in spirit before putting on gloves is to dry them, and this can be achieved by the use of a sterile towel. This condemnation includes the bowl provided in the theatre for rinsing the gloved hands during the operation itself. No mention is made in this memorandum of the solution of mercury biniodide in spirit which is so much favoured for a variety of purposes, but we venture to suggest that its use might well be abandoned altogether; it is greatly inferior in disinfectant power to a solution of mercury perchloride in water; and in any event mercury salts themselves should be employed with economy.

The sterilization of skin before operative incision is admittedly a purpose for which alcoholic solutions are useful, owing to the rapidity with which they evaporate, leaving their dissolved constituents *in situ*. To overcome the drawback of antiseptic solutions made up in water the only requirement is patience, and it is recommended that any of the aqueous antiseptics specified should be allowed three minutes to act and to dry before the operation is begun. Spirit is also considered superfluous in many cases for prevention of bed-sores; alternatives are careful drying after washing and dusting with talcum powder, or, for dry skins, massage with a mixture of zinc oxide and castor oil.

[1] *British Medical Journal*, 1941, **1**, 246.

This review of these new provisions is not intended as a complete guide to the methods recommended, but merely as an indication of their nature and an explanation of their necessity. It must clearly be understood that these changes, whatever their merits, will inevitably be imposed on surgical staffs by the impossibility of obtaining enough spirit to continue the methods to which they are accustomed. We have also endeavoured to make it clear that merely theoretical discussion is not their only basis: where *ad hoc* investigations have seemed necessary in order to confirm the efficacy of some proceeding or to reveal the extent of its possible drawbacks, actual tests have been made to settle the point in doubt. Whether a committee with a free hand to improve sterilization technique and unfettered by the need for drastic economy in a particular type of material would have made exactly the same recommendations we do not know. But undue reliance on spirit as a disinfectant is certainly one of the major faults in existing practice, and it therefore so happens that the ends of both economy and efficiency are served by the same means.

STANDARDIZATION OF DIPHTHERIA PROPHYLAXIS

To those who have not been continuously engaged in immunization against diphtheria the evolution of the procedure has been confusing and the choice of prophylactics difficult. From the original toxin-antitoxin mixture of von Behring we have moved to formol toxoid, toxoid-antitoxin mixture, toxoid-antitoxin floccules, and alum-precipitated toxoid. There seemed to be no finality as to either the reagent to be preferred, or its dosage, or its time-spacing. For these among other reasons, a Committee on Immunization of the British Medical Association in 1935 summarized the knowledge available at that time, and the same purpose was served in 1940 by a committee of the American Public Health Association.[1] In some respects American practice differs from ours, but the outstanding contrast lies in the success achieved in Canada and the U.S.A. in the application of specific prophylaxis, although many of the improvements in the reagents have been made by workers in this country like Parish, Glenny, and their colleagues. Our relative failure may partly be attributed to the confusion we have mentioned. To some extent the prospect is brighter since the Ministry of Health began publicly to advocate immunization with some vigour toward the end of last year, and practical guidance (a little too brief) was afforded in an official memorandum.[2] While four of the five reagents mentioned above are in common use, it is now generally agreed that at least for young children, on whom a special effort should be concentrated, alum-precipitated toxoid is the prophylactic of choice. It may be noted, however, that while the Ministry states that the usual practice in this country and the U.S.A. is to administer doses of 0.2 c.cm. and 0.5 c.cm. at four-weekly intervals, the Emergency Laboratory Service of the Medical Research Council, which now acts as the Ministry's distributing agent, advises 0.1 c.cm. and 0.3 c.cm. with the same time-spacing. If the latter dosage is sufficient it would be wasteful to give more.

It is this continuing state of uncertainty which has stimulated Dr. J. Tudor Lewis to discuss the whole matter in a timely and useful book.[3] By closely reasoned and clear argument, informed by the quoted accounts of others and his own fairly extensive experience in Croydon, he tries to reach a plan which can be adopted universally. It may be said at once that the scheme which commends itself to him is a still further variant of those propounded by the Ministry and the Emergency Laboratory Service. If the use of other reagents be disregarded—and there is not much difference of opinion as to how they should be used—he advocates the following procedure with alum-precipitated toxoid: for children under 8 years of age a first injection of 0.5 to 1 c.cm. intramuscularly into the extensor aspect of the left arm, followed in not less than a month by 0.5 to 1 c.cm. in the right arm; but for children over 8 years a first dose of 0.1 to 0.25 c.cm. and a second (if the first causes no reaction) of 0.5 c.cm. with the same interval and change of site. The interval, it will be noted, must always be at least a month—an important point which still does not seem to be widely enough realized. The larger initial dosage for young children is designed to compensate for their less ready reaction to antigenic stimulus, probably because they have been subjected less to the "priming" of latent infection, and it is practicable because they are less likely to have uncomfortable reactions. Moreover, the degree of immunity derived from this one injection, if the child fails to return for a second, will still be considerable. Indeed, although he is emphatic on the desirability of two injections, Lewis is not so dogmatically condemnatory, as some British and Canadian workers are, of the practice in some American quarters of giving alum-precipitated toxoid in single doses. As to the age drawing the line between his two methods, he would no doubt admit that this might vary with the type of area and its past experience of diphtheria, in much the same way as he suggests that this should lead to a decision whether preliminary Schick tests ought to be done. In rural or other protected groups of the population children even over 8 years may show a resistance to immunization comparable to that of the average younger child in town. It would appear to follow, if Lewis is right as to dosage, that the schemes approved by the Ministry and the Emergency Laboratory Service are not universally the best for every area and every age group. They may, however, be sufficient for practical purposes, especially if waning immunity is revived a few years later by a further dose—for instance, on school entry among those primarily immunized in infancy.

In recounting the few disasters which have occurred in the process of immunization Lewis conveys the impression that nothing of the kind has happened where a British reagent has been used. The omission to mention the "Ring case" is hardly justified by the fact that the preparation used was exonerated in a court of law and was almost certainly not the cause. There was evidence that tuberculosis occurred as the result of immunization, and there is little more reason to exclude this incident from record than there would have been for treating the inexcusable contamination of the prophylactic with staphylococci at Bundaberg in the same way. Every misfortune of this kind has its lesson, which Lewis in another part of his book drives home by quoting the investigations into sterilization of instruments which arose out of the events at Ring.

[1] *Amer. J. publ. Hlth.*, March, 1940, Supplement.
[2] Min. of Hlth. Memo. 170 Med., 1940.

[3] *The Principles and Practice of Diphtheria Immunization.* By J. Tudor Lewis, M.D., D.P.H. London: Oxford University Press. 1941. (8s. 6d.)

CYSTICERCOSIS

The recent outbreaks of trichiniasis in this country have drawn attention to the fact that raw pork is a more popular item of the diet of certain groups of the population than the health authorities realized. This shows the necessity for thoroughly cooking all pork in order to prevent infestation not only with *Trichinella spiralis* but also with the less common *Cysticercus cellulosae*, the cystic stage of *Taenia solium*. This tape-worm, a rare parasite in England, is common in Asia and in many parts of Europe. Most of the cases seen in this country have been in soldiers who have served in India, where the sanitation has been defective, the habits of the people less cleanly, and pollution of ground and water supplies with human excrement possible. Apart from those suffering from intestinal infestation with the adult worm, many, as recorded by MacArthur[1] and more recently by Blyth[2], have presented themselves as cases of epilepsy due to infestation with the cystic stage (which occurs more usually in pigs).

The adult parasite *Taenia solium* lives in the intestine in man, attaining when mature a length of about 10 feet composed of approximately 800 segments. The terminal ten or twelve segments, or proglottides, consist of the uterus and its branches, which contain about 30,000 ova. If these ova, which normally develop further in the pig, are swallowed by man, small six-spined embryos are liberated in the stomach; these pass into the blood stream and thence to all the tissues of the body. Brailsford[3] considers that autoinfestation through the regurgitation of ripe proglottides of an intestinal *Taenia solium* into the stomach happens very rarely; otherwise infestation would be much more extensive than in the worst cases that are seen. The embryos develop in the connective tissues, particularly of the musculature, and in the central nervous system. If they reach a favourable site, each develops into a *Cysticercus cellulosae*. Many of the embryos proceed to full development, while others die, disintegrate, and become calcified. The fully developed embryo can live encysted in the musculature for some years. While alive the cyst is about 3/8 in long and 1/4 in. broad; it is flaccid and its wall is elastic. It appears to cause little reaction, beyond the development of a fibrous capsule, in the adjacent host tissues. After an interval of several years the inimical products in the host tissues cause the death of the parasite. This is followed by necrosis, disintegration, absorption of fluid, shrinkage, and deposition of calcium.

Special feeding experiments have shown that within a month of the ingestion of ova the parasites begin to develop in favourable sites, and that within four months the embryo is fully formed within its cyst. But in contrast to human trichiniasis there are few or no symptoms until probably several years after infestation. Then the patient may notice painless nodules in the subcutaneous tissues; they are either mature, live, or dead cysts. It is often stated that the central nervous system is more frequently infested than the skeletal tissues, but Brailsford considers this an erroneous impression. He thinks it is due to the fact that the symptoms resulting from infestation of the brain or eye often appear before cysts in the subcutaneous tissue are demonstrable, either clinically or radiographically. He has for many years made a careful study of the condition, examining some thousands of *x*-ray plates of patients in both general and mental hospitals. He believes, in contrast to MacArthur, that the number of cases of epilepsy and cerebral disorders due to infestation with *Cysticercus cellulosae* is very small. The degeneration and calcification of the contents of the parasitic cyst do not take place so readily in the brain as in the musculature: consequently patients may show signs and symptoms of cerebral involvement. As long as ten years after calcified cysticerci have been radiographically demonstrated in the connective tissues of the musculature, radiographs of the skull may not have shown any evidence of the presence of such parasites in the brain. Brailsford suggests that in cases of epilepsy where infestation is suspected a radiograph should be taken of the muscle of either the thigh or the calf, and if these fail to show cysticerci it is unlikely that radiographs of the skull will. These cysts should never be confused with the cystic stage of *Trichinella spiralis*, for the latter is so small that when fully developed it is only just visible to the naked eye. Most cases of infestation of the central nervous system will end fatally, in contrast to cases of trichiniasis, to which, according to Bercovitz,[4] there are no permanent sequels. Though not a common condition at present, cysticercosis may need to be watched for in future after the wide distribution of our armies abroad.

1 *J. R.A.M.C.*, 1934, 62, 241.
2 *British Medical Journal*, 1941, 1, 401.
3 *Brit. J. Radiol.*, 1941, 14, 79.

VARIATIONS IN AGE OF ONSET OF HEREDITARY DISEASES

It is well known that in the case of many hereditary human diseases age at onset is a very variable feature. It is further known that there is often a marked tendency for sufferers belonging to the same family group to resemble each other in this respect. It may also be accepted that age at onset is closely associated with the selective disadvantage of a gene: a very early onset in the case of a serious condition makes the reproductive rate *nil* or almost *nil*; while a very late onset may yield a rate of almost unity. Variations in age at onset may come about in any one of three ways. First, there may be two or more main genes, any one of which produces a clinically similar condition, but age at onset will vary according to which gene is responsible. Secondly, a single main gene may be responsible, but modifying genes may determine the time at which the effect is produced. Finally, in the presence of a single main gene environmental conditions may favour an early or a late onset. Professor J. B. S. Haldane[5] has made an analysis of these possibilities using data recently published by Dr. Julia Bell[6 7 8] on several inherited conditions. He points out that if the first of the three possibilities is realized the correlation between sibs as regards age at onset and also between parent and child would tend to be very high. It would not of course be unity, because there must certainly remain some residual variation even when the same gene is concerned. If modifying genes were responsible for the observed variations the correlation would tend to be of the order of 0.5. If, on the other hand, environmental influences were chiefly responsible we should expect to find lower correlations, the figure for sibs, however, being higher than that for parent and child because sibs tend to share a more similar environment. There should also occasionally be associations with other factors—for example, sex or occupation. In the case of the hereditary ataxias and spastic paraplegia the tendency for members of a family group to exhibit a similar age at onset is very strong indeed. The correlations exceed 0.5 with a high degree of significance. There can be no doubt that in these cases any one of several main genes may cause the condition, and the observed variations are to be attributed above all to this circumstance. The same result is found in the case of glaucoma and peroneal atrophy. Even in these cases, however, there is the suggestion that modifying genes may occasionally play an important part, because a few pedigrees display very large variations. It is probable that about 1% of the population carries modifying genes which greatly delay

4 *Amer. J. trop. Med.*, 1940, 20, 849.
5 *J. Genetics*, 1941, 41, 149.
6 *Treasury of Human Inheritance*, 1934, 4, 1.
7 Ibid., 1935, 4, 69.
8 Ibid., 1939, 4, 141.

the onset of Friedreich's ataxia. In the case of Huntington's chorea the correlations are of the order of 0·5. It may well be that in this instance a single main gene is responsible and that variations in age of onset are indeed due to modifying genes. The same may be true of Leber's optic atrophy, but this condition is a genetic curiosity. No Mendelian scheme fits the facts of its transmission, and at the moment it can only be unsatisfactorily labelled as a possible case of cytoplasmic inheritance: unsatisfactorily because of the extreme rarity of such transmission, particularly in the higher forms. Huntington's chorea appears to fulfil the criteria demanded by Fisher's theory of the evolution of dominance, selection through the ages having produced an ever later age at onset of the disease. The ultimate tendency may be for the condition to become in effect recessive, when there would follow a spread of the gene with perhaps the appearance of a much more pronounced condition due to the simultaneous presence of two of the abnormal genes.

TUBERCULOSIS IN DOGS

It is known that dogs may become infected under natural conditions with human and bovine tubercle bacilli, but the recorded incidence varies from 0.04% to 1.0% in statistics based on clinical work and from 0.83% to 5.6% in figures obtained at necropsy. Lovell and White[1] found that 4.6% of the dogs brought to the clinics of the Royal Veterinary College Hospital, which were mainly the property of poor people living in London and, therefore, not random samples, were tuberculous at necropsy. Of twenty-two dogs with tuberculosis nineteen were males and three were bitches; the ratio of males to females among those coming to necropsy during the same time was only 3:1. Eight of the twenty-two were wire-haired fox terriers (36%), but of 350 received consecutively for necropsy only 11% were of this breed. (Hjärre[2] in Stockholm found the highest incidence among Irish setters and fox terriers.) In three dogs the main symptom was swelling of the mandibular lymph node, while one had no ill-health apart from thickening of the spermatic cord. With primary involvement of the mesenteric nodes the symptoms were usually vomiting and diarrhoea of a few weeks' duration, and when the lungs were solely or principally infected there was a history of loss of condition and coughing for periods varying from a few days to a year. Involvement of the serous membranes was common. There was tuberculous pleurisy in nine of the twenty-two dogs, with effusion in six; in five of these the omentum or parietal peritoneum was also involved. Altogether there were seven cases of tuberculous peritonitis, which was accompanied by effusion in only one instance, and in five of them there were also omental lesions; the latter were seen in three additional cases. There was one case of primary tuberculosis of the tonsil. Lovell and White failed to find healed tuberculous lesions. In only four of the twenty-two animals was the bovine type of bacillus isolated, and in all these the mesenteric nodes were affected. This relative incidence of human and bovine infection is comparable with that found by other workers: approximately three-quarters of natural cases of tuberculosis in dogs are caused by the human bacillus. This appears to be due more to the opportunity for infection than to any difference of susceptibility to the two types. There is only one record of infection of avian origin. A definite history of tuberculosis in the owner (or other member of his family) of three of the affected dogs was obtained. In Stockholm, Hjärre and Herlitz[3] examined the history of the household in twenty-five cases of canine tuberculosis, and found evidence of tuberculosis in six. The authors failed to produce evidence of transmission of the disease from dog to man, but they emphasize the danger that might arise from infected sputum and urine of tuberculous dogs. The paper by Lovell and White should help to draw the attention of workers to an aspect of the tuberculosis problem in man which has hitherto been ignored.

[1] *Brit. J. Tuberc.*, 1940, 34, 117.
[2] *Acta tuberc. scand.* 1939, 13, 103.
[3] *Acta paediatr., Stockh.*, 1935, 17, Suppl. 1, 141.

AMERICAN MEDICAL WOMEN'S GESTURE

In the middle of the last war, as a result of a widespread desire of medical women in the United States to participate in war service, the American Medical Women's Association set up an organization known as "The American Women's Hospitals." The first unit sailed for Europe in June, 1918, and Hospital No. 1 was established in France in the following month. The armistice, however, came about three months afterwards, so that actual war service was very brief. The organization continued in being, and directed its energies to the care of the sick and the prevention of disease in many European and Asiatic countries, fully or partially maintaining and conducting over seventy hospitals and three hundred clinics. In London it assisted in the endowment of a bed in memory of Dr. Elizabeth Blackwell in the Washington Ward of the Royal Free Hospital. A year ago the Medical Women's Federation received from Dr. Esther P. Lovejoy, who has served for many years as chairman of the American Women's Hospitals, the offer of a monthly contribution for the relief of civilians in the bombed areas of Great Britain, and up to date £3,000 (12,000 dollars) has been received, and a further 1,000 dollars (about £247) a month has been promised. These sums have enabled the executive committee of the Federation to send financial help to many districts in the London area and a dozen or more other cities which have suffered air bombardment. Medical work naturally had first call, but it has not been possible to restrict the help to that. It has included the provision of clothing for evacuated children, arranging a period of quiet convalescence for women who have suffered in bombed areas, feeding the homeless, supplying furniture for district nurses whose home had been destroyed, giving help in the shelters, especially for recently confined women and their babies, and assisting the blind and crippled. One medical mobile unit, staffed by a medical woman and trained nurses, has been helped, and in another case some help has been given to enable a large provincial hospital to open up again after severe damage. Just before the outbreak of war Dr. Lovejoy described the twenty-years service of "The American Women's Hospitals" in a book, and she said that the organization should carry on, hoping for peace and constructive work, but ready for any emergency which might arise. The emergency very quickly arose, and it is a happy thing that American and British women doctors should be collaborating in this way, on the one side furnishing the money and on the other side administering it, for the relief of suffering due to the war.

We regret to announce the death at the age of 87 of Dr. R. Percy Smith, F.R.C.P., consulting physician for mental diseases, St. Thomas's Hospital, and a former medical superintendent of Bethlem Royal Hospital.

The following appointments have been made by the Council of the Imperial Cancer Research Fund for the ensuing year: Chairman of the Council, Prof. H. R. Dean; vice-chairman of the Council, Sir Cuthbert Wallace, Bt.; Elizabeth Wills Allen Fellow, Dr. L. Foulds; Alice Memorial Fellow, Dr. R. J. Ludford. Prof. James Young has been appointed a Governor of the Fund by the Royal College of Surgeons of Edinburgh, and Prof. T. J. Bosworth by the Royal Veterinary College and Hospital.

CHEST SURGERY IN WAR

This is one of a short series of articles based on lectures given at the British Postgraduate Medical School, Hammersmith

ABDOMINO-THORACIC INJURIES *

BY

GORDON GORDON-TAYLOR, M.S., F.R.C.S.

Temporary Surgeon Rear-Admiral

TREATMENT OF PENETRATING ABDOMINO-THORACIC INJURIES

The surgery of the thoracic wall and cavity is being dealt with in this series of lectures by those most expert in the surgery of this region. My contribution is therefore only concerned with the surgical treatment of injuries of the diaphragm and of those abdominal organs whose anatomical proximity renders them specially vulnerable in cases of diaphragmatic wounding.

I. Wounds implicating the Liver

The dimensions and the velocity of the missile play an important part in determining the type of hepatic lesion, which may be almost protean in character; large fragments of liver may be torn off, and as much as one-third of the right lobe has been found loose in the peritoneal cavity of a patient who recovered from a penetrating abdomino-thoracic injury in the last war.

Before their total destruction the examination of museum specimens in the College of Surgeons collection illustrating gunshot wounds of the liver revealed many lesions for which surgery must be futile or incomplete: thus it would be impossible by operative measures alone to prevent infection throughout the length of a ragged track running from the right lateral surface of the organ to its extreme pole on the other side of the body. In many cases of liver injury due to enemy action there are few arresting clinical signs, and it is significant that out of all the penetrating injuries of the abdomen which recovered in the last war without operation the wounds were mostly situated in the liver area. *Surgical intervention* directed towards the liver is indicated under the following circumstances only: (1) *gross haemorrhage from the liver*, which mainly depends on whether large veins in the organ have been injured—haemorrhage otherwise ceases spontaneously, as does oozing of bile, unless main ducts are severed; (2) the association of some thoracic or another abdominal lesion demanding exploration; (3) the retention of a missile in the liver, especially a large missile in an accessible position in that organ. In the case of severe laceration of the liver packing may be necessary to control haemorrhage. In some such patients the diaphragm may be sutured, and the thorax closed in the approved manner with airtight drainage of the pleura by means of a Malecot's tube inserted through a separate intercostal incision. The gauze pack is brought out through another separate incision in the anterior abdominal wall. In other cases the diaphragmatic opening may be enlarged parallel with its fibres from mediastinal to lateral border; the diaphragmatic edges are now approximated to the intercostal muscles and the pleura is thus shut off from the drainage track.

Early jaundice in cases of hepatic injury may be present, and is usually slight and evanescent; the possibility of a collection of bile in peritoneum or pelvis should always be considered. *Late jaundice* has a much graver significance, and indicates serious infection.

Secondary hepatic haemorrhage in penetrating abdomino-thoracic injuries is almost always fatal, and is usually associated with signs of sepsis such as pain, elevation of temperature and pulse rate, abdominal pallor, restlessness, and loss of strength.

The formation of an *intrahepatic abscess* round a retained fragment may be dealt with successfully by surgical measures.

II. Gunshot Injury of the Spleen

A study of the specimens of *gunshot injury of the spleen* in the War Collection formerly housed in the Royal College of Surgeons used to suggest that wounds of that organ are frequently complicated by damage to adjacent viscera; yet in some collected clinical series it is stated that in more than half the cases of splenic injury revealed at operation there was no damage to other abdominal organs. This was certainly not my experience (Gordon-Taylor, 1939), which is in agreement with that of Major Jolly in his surgical work with the Spanish Republican Army (Jolly, 1940).

The propriety of primary splenectomy in cases of gunshot injury will still remain a subject of controversy. The removal of the organ should certainly not be resorted to light-heartedly, but in my opinion the procedure has not greatly increased the risk. The suture of the spleen may not be difficult when the organ is approached through the chest and diaphragm, but when explored by other routes cobbling of the organ is wasteful of time and may leave a sense of insecurity. Jolly (1940) and some of the Spanish surgeons write enthusiastically of splenectomy.

Numerous cases of successful transdiaphragmatic splenectomy in left-sided abdomino-thoracic wounds were recorded in the war of 1914-18, some of which were associated with the operative repair of injuries to the stomach (Richard Charles, Gask, J. E. H. Roberts, Lockwood, Bryan, Gordon-Taylor, etc., and very recently by Valentine Logue). Recovery has even taken place in cases of left-sided abdomino-thoracic wounds in which left-sided nephrectomy as well as splenectomy had to be performed for complete disruption of each organ (Gordon-Taylor).

III. Wounds of the Pancreas

These injuries were less frequent in the war of 1914-18, or at any rate were less often recognized, than injuries of any other of the abdominal viscera. The intimate anatomical relation of the gland to the large blood vessels doubtless explains the paucity of wounds coming under the observation of the casualty hospital surgeons; doubtless some were unrecognized and were designated retroperitoneal haematomata. I have knowledge of only three abdomino-thoracic injuries implicating the pancreas in which recovery took place (Saint, Alan Curry, Gordon Bryan).

IV. Injury to the Kidney

Each kidney is equally liable to damage. It was estimated that in 40% of gunshot wounds of the kidney investigated at an English surgical base in France during 1914-18 the thorax was also implicated. The propriety of immediate operation on the kidney in abdomino-thoracic wounds demands even more careful consideration than in purely abdominal injuries. Probably the best course is to excise the wound leading down to the damaged kidney; the organ can then be inspected and any foreign body removed.

* Concluded from p. 864.

In the majority of cases the renal injury plays a minor part in menacing life, and only for severe haemorrhage, a hopelessly pulped organ, or gross damage to the renal pedicle is primary nephrectomy indicated. In about 20% of cases of gunshot injury of the kidney in the last war life was threatened by secondary haemorrhage, consequent on sepsis, a retained missile, or an infarct of the kidney produced by damage to some branch of the renal artery.

V. Injury to the Hollow Organs

Of hollow organs the *stomach and splenic flexure of the colon* are those most liable to injury, in suitable cases transdiaphragmatic laparotomy affords excellent access to these organs. Concomitant involvement of the *small intestine* denotes a more vertical track of the missile, and demands a separate approach or a much-extended incision. Each measure, though necessary, increases risk to life. Multivisceral damage also augments mortality, and vertical wounds, which may even extend from supraclavicular fossa to femur, tend to be very fatal.

The possibility of injury to the *duodenum* must be borne in mind, and any haematoma in its vicinity should be suspect, lest a retroperitoneal rupture of this fixed part of the small gut be overlooked. These cases were very fatal in the last war; successful cases have recently been operated upon by Rex Williams, Henry Thompson, and Hedley Atkins.

Summary of Treatment

1. In many traversing (through-and-through) abdomino-thoracic wounds of the right side produced by a small fragment no immediate active surgical treatment is required, provided that: (*a*) no gross damage has been inflicted upon the thoracic or abdominal wall—fractured ribs, explosive effect, etc.; (*b*) the direction of the track of the missile does not appear to compromise the general peritoneal cavity or suggest the desirability of its exploration; (*c*) the signs of abdominal haemorrhage or of injury to a hollow viscus are clearly absent.

2. In cases of right-sided abdomino-thoracic wounds in which a small fragment is retained in an inaccessible position in the substance of the liver an expectant line of treatment is the correct procedure; accessible fragments, unless of small dimensions, should be sought and removed.

3. When there is an open, blowing thoracic wound or a "stove-in chest," the chest wound should of course assume chronological priority of treatment.

4. If the position of the wound of entry and exit in a left-sided abdomino-thoracic wound adumbrates a track implicating that fatal left subphrenic area of the abdomen, or if a radiograph demonstrates a fragment of metal retained in this region, the thorax should be dealt with first and access to the upper abdomen obtained through the diaphragm.

5. When the thoracic injury appears insignificant but there is evidence of severe widespread intraperitoneal damage, especially involvement of hollow viscera, the abdomen should be explored through an appropriately placed laparotomy incision. This instruction applies to wounds of thorax and abdomen produced by the same or by separate missiles.

6. When the thoracic injury seems slight and when the evidence of a radiograph or the direction of a missile track in a through-and-through wound suggests an extra-peritoneal course of a small fragment, such an abdomino-thoracic injury may often be left alone.

If in such cases there is evidence of injury to the kidney the parietal wound down to the kidney should be excised, the organ investigated, and any foreign body removed.

7. In cases in which the thoracic wound is situated low down on the lateral or antero-lateral aspect of the chest access to both supradiaphragmatic and infradiaphragmatic areas may be obtained by cutting through the costal arch after the manner of Bland-Sutton, Duval, Bérard, etc.

8. If an abdomino-thoracic injury has been approached from the abdominal aspect, it is important not to waste time trying to complete a difficult suture of the diaphragm in a critically ill patient, unless the aperture in the midriff is so large that immediate or early herniation of the abdominal contents is certain to occur.

Prognosis

In one large series from the war of 1914-18 it was found that operated abdominal cases (excluding abdomino-thoracic injuries) gave a recovery rate of 51%; while abdomino-thoracic wounds operated upon produced a recovery rate of 44.5%. But some series of abdomino-thoracic cases in the casualty clearing zone gave a more favourable recovery rate than this: in the autumn of 1918 it attained the figure of 66.6% in the hands of certain surgeons in the British Fourth Army; and some operators (Jack Anderson, Saint) who were perhaps fortunate in their percentage of right-sided cases saved as many as 70 and 80% of their patients (Gordon-Taylor, 1939).

Wounds that traverse the diaphragm from below upwards are said to be more grave than those in which the missile has passed from thorax to abdomen. In the former group an intestinal injury increases the seriousness of the prognosis.

The mortality figures attending the surgical treatment of injury in one campaign are scarcely comparable with those of another war at a different period, in which the type of enemy missile, the degree of explosive force, the facility of transport from the field of battle, and other circumstances differ; but the steady improvement in the results of abdomino-thoracic cases from year to year in the war of 1914-18 was a memorable triumph of surgery.

NON-PENETRATING INJURIES OF THE ABDOMINO-THORACIC ZONE

In contrast to the last great European conflict non-penetrating injuries of the abdomino-thoracic zone do not play the same small and infrequent part in war surgery to-day; the thoracic and abdominal viscera, solid and hollow, may be damaged under a variety of circumstances in "modern" warfare. Fragments or masses of timber, stone, or metal may be confusedly hurled with explosive force against chest and abdomen in the indiscriminate air bombardment of civilians; women and children have suffered "crush" contusions of thorax and belly from falling masonry and iron girders; visceral damage above and below the midriff may result from the blast of detonating bombs, mines, or other high-explosive machinery in close proximity to men and women of every age, condition, and calling, for in "total war" none can claim privilege or sanctuary. Nor does the diaphragm remain immune when chest and belly suffer violence.

Effects of Rupture of the Diaphragm

Rupture of the diaphragm may be produced by the passage of a heavy vehicle obliquely across the abdomino-thoracic zone, by the crushing force of buffer accidents, or from the demolition and collapse of buildings. An excellent account of the injury has been given by Gordon Bryan (1922), who points out that the lesion is not very rare in children and adolescents, whose chest wall is more elastic and can be compressed to a considerable degree without fracture. In some cases costo-chondral dislocations may occur, as shown by some displacement of the

chest wall and a clicking sound on respiration; at other times the diaphragm is torn by stretching or bursting, or may be lacerated by a fractured rib.

The convexity of the diaphragm is the part that usually suffers; on the rarest occasion the crus is damaged. The left side of the midriff is that most prone to rupture under such conditions of violence; the liver is more likely to bear the brunt of an injury due to compression of the right side, yet the right dome of the diaphragm has been torn, with a resultant haemothorax and even the escape of bile into the pleura. The diaphragmatic lesion may readily be overlooked in the presence of cataclysmic intraperitoneal bleeding. Rupture of the diaphragm produces shock, dyspnoea, and a disordered action of the heart. The pulse is rapid and irregular; the breathing is almost entirely thoracic, but diaphragmatic respiration may be restored after a day or two by the plugging of the rent by omentum, spleen, etc.

Dyspnoea and tachycardia occur with herniation of the stomach into the chest; and severe pain with rigidity of the left hypochondrium is complained of, and also pain in the neck or shoulder from irritation of the diaphragmatic peritoneum. Thoracic distress is produced after meals; radiological examination will readily establish the diagnosis.

Rupture of one or both crura of the diaphragm may occur as the result of a subparietal injury. Bryan (1922) records a rupture of the left crus associated with a compression fracture of the eleventh and twelfth thoracic vertebrae resulting from a fall of thirty feet on to the pavement in a sitting posture. The intraperitoneal haemorrhage, which suggested a ruptured abdominal viscus, determined a laparotomy.

Severe crushing injuries of the chest have been known to produce a *tearing lesion of the mediastinum*, even when there has been no fracture of ribs or sternum. This has been found associated with a large retroperitoneal haematoma from damaged vessels in the root of the mesentery (Sauerbruch and O'Shaughnessy, 1937). The displacement of the mediastinum may suggest the diagnosis of a tension pneumothorax; investigation of the intrapleural pressure and the use of radiography should prevent unnecessary and harmful surgery.

The diagnosis and treatment of *subparietal injuries of the spleen* are well established and require no comment. For similar *hepatic injuries* thorough surgical exposure is necessary. Subparietal or non-penetrating *injuries of the kidney* are generally isolated lesions, and most often are mere contusions of the organ without rupture of the renal capsule. In injuries of the abdomino-thoracic zone which menace life concomitant damage rather than the renal lesion demands most attention. The chief indications for early surgical intervention on the kidney are: (1) cataclysmic haemorrhage; (2) persistent pain and aggravation of the clinical symptoms and signs of renal injury during the first forty-eight hours, especially increasing tenderness in the iliac fossa and hypogastrium with spasm of the psoas muscle; such clinical phenomena denote a spreading extravasation of blood, urine, or both. The size of any perinephric swelling that may be detected is some criterion of the degree of kidney injury. An appeal may also be made to urographic methods of diagnosis.

It should be remembered that early exploration in a doubtful case will render this service to surgeon and patient—that a deliberate conservative resection of the damaged portion of the kidney can be considered at a period when urgency is not so extreme that only a hurried total nephrectomy can save life. In arriving at a decision as to the exact technique to be employed in a case, it behoves the surgeon to remember the slogan: "First save the patient, and secondly, if possible, save the kidney."

Sequelae of Rupture of the Diaphragm

Other effects of injury of the diaphragm include: (1) the lodgment of fragments of foreign bodies in the diaphragm itself; (2) diaphragmatic hernia; (3) scarring and adhesions.

The most dramatic of these sequelae is *diaphragmatic hernia*; this may develop immediately or soon after the injury; on the other hand symptoms are commonly delayed for several months or longer. Traumatic diaphragmatic hernia rarely produces symptoms on the right side, and at most contains only a small piece of omentum in that situation. Only very rarely does a rent occur between the abdomen and the pericardium. The left dome is that most often implicated, and the herniated viscera include the omentum, stomach, transverse colon and splenic flexure, spleen, and jejunum; it is stated that the pancreas, liver, and duodenum are only very rarely herniated.

Such cases are best operated upon by a thoracic approach: an incision is made in the eighth or ninth intercostal space; the resection of adjoining ribs may also be required. Positive-pressure anaesthesia is employed; the phrenic nerve is crushed as it lies upon the pericardium before entering the diaphragm. The extruded viscera are first separated from the edges of the diaphragmatic aperture and thoracic structures, and are then coaxed into the coelom.

The repair of the rent in the diaphragm may be difficult if the muscle has undergone fibrotic or atrophic changes. Strong silk is employed: in some cases fascial grafts seem to give greatest promise of permanent closure. In others the gap can only be closed by suture of the liver, spleen, or stomach to the margin of the opening. In cases of some duration the stomach may have undergone hypertrophy and dilatation, and a laparotomy may also be required to anchor it satisfacforily inside the abdomen. The performance of a temporary gastrostomy in some such cases has proved of inestimable value in my hands. The complication of *strangulation* in connexion with a *diaphragmatic hernia* is fraught with the gravest peril. The colon is the segment of the alimentary canal most frequently obstructed; sometimes the jejunum is the part compressed; very rarely is the stomach strangled.

A correct diagnosis is not often attained unless there is previous knowledge of the existence of a hernia; but where such knowledge is lacking an antecedent history of a severe injury in the abdomino-thoracic zone, a previous complaint of post-prandial discomfort and even dyspnoea, hiccup, precordial oppression, and pain in the shoulder, together with the evidence of competent radiology, should enable a pre-operative diagnosis to be made.

The symptoms of strangulation usually supervene suddenly; the baleful results of operation for this disastrous complication constitute a powerful argument for early operation upon traumatic diaphragmatic hernia, at any rate if the symptoms to which it gives rise show any evidence of worsening. The transthoracic approach should be employed.

Familiarity with the transdiaphragmatic approach to the vault of the abdominal cavity has been turned to useful purpose by thoracic surgeons in the operation of cardiomentopexy (O'Shaughnessy, J. B. Hunter). The successful operation by Pierre Duval (1918) for the extraction of a bullet from the suprahepatic portion of the inferior vena cava, in which the sternum was split and the diaphragm divided backwards to the caval opening still remains to my mind the most brilliant operation in the history of surgery.

Even the general surgeon avails himself of an abdomino-thoracic approach in operations for the surgical removal of

malignant disease of the lower end of the oesophagus or e cardiac orifice of the stomach.

No reference to the employment of the sulphonamide erivatives has been made in this communication; this is ow a routine measure, and its value is incontestable. The evere shock which appears so constant in wounds of the trunk in this war demands a bountiful supply of blood and plasma, which on occasion is preferably introduced rapidly into the veins of the recipent

In this war abdomino-thoracic injuries due to fragments of high explosive are probably less grave than those due to crushing force or the effects of blast.

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PROTECTING MEDICAL SUPPLIES AGAINST CONTAMINATION BY GAS

The problem of protecting medical supplies against contamination by poison gas is analogous in many respects to that of protecting foodstuffs, and doctors and hospital authorities will therefore get much help from the handbook issued by the Ministry of Food, *Food and its Protection against Poison Gas*. Some medical supplies, however, present special problems of protection and decontamination and the Ministry of Health's circular (No. 2385) to local authorities and hospitals contains the following advice and suggestions.

The normal conditions of storage of medical and surgical supplies in suitably warmed and ventilated buildings should provide for most articles all that is practicable in the way of protection against liquid contamination. Some additional protection can also be afforded by using existing stocks of waterproof sheeting, batiste, cellophane, or other impermeable material if they are not required for immediate use as a covering for unprotected stores or stores whose nature or wrapping does not of itself provide protection.

Surgical dressings, cotton-wool, bandages, etc., wrapped in paper, cardboard, or cartons.—These would not become contaminated by exposure to vapour providing the wrappings are undamaged. Traces of vapour can, if necessary, be removed from such materials by opening them out and airing for an hour or so in a clean, well-ventilated warm atmosphere. Sterilization might be undertaken where the means are available. If contaminated by liquid it is extremely doubtful whether any decontamination treatment would be satisfactory and destruction by burning may be unavoidable.

Drugs and medicines in metal containers.—If adequately sealed no contamination of the contents can occur. If contaminated by liquid the containers should be decontaminated by repeated swabbing with solvent such as paraffin, petrol, etc., and airing; the corks, etc., unless protected by metal or other seal, should be destroyed and replaced by new ones.

Rubber materials, surgeons' aprons, waterproof sheeting, hot-water bottles, etc.—Vapour contamination will, in general, not be serious and could be removed by airing. If contaminated by liquid, decontamination by immersion in boiling water for a period of one to three hours, depending on the thickness of the rubber, would be essential.

Gum elastic catheters, surgeons' gloves, fine rubber drain sheeting, etc.—The finest grades of rubber materials are unlikely to stand boiling, and if contaminated by liquid should be destroyed. Covering to prevent such contamination is therefore most desirable.

Wooden furniture, bedding, etc.—The decontamination treatment for such articles is detailed in *A.R.P. Handbook* No. 4. In the case of bedding in general and mattresses in particular treatment in a steam disinfector is the only practical process.

Metal instruments and utensils.—These, depending on their nature, can be decontaminated by immersion for thirty minutes in boiling water or repeated swabbing with solvent.

MEDICINAL HERBS IN WARTIME

The Minister of Health recently appointed an expert committee "to review the present and future requirements of vegetable drugs in the light of Empire consumption and trade, and facilities for cultivation within the Empire; to consider the steps which should be taken to secure organization of cultivation and collection; and to make recommendations to the Minister." This "Vegetable Drugs" Committee has now presented an interim report and recommendations. The report differentiates between two groups of drugs—a "long-term" and a "short-term" group.

Long-term Group of Drugs

It is unlikely that any long-term policy will materially affect the supply of these drugs during the present emergency, as the latent period between initiation of schemes and production for the market is so long. One primary essential for a long-term policy is an assured and steady market and remunerative prices for the producers within the Empire, particularly in respect of drugs requiring many years of experimental cultivation and considerable financial outlay before regular supplies can be available. The establishment of such stable conditions would probably necessitate (a) financial assistance to growers in the Colonies and Dominions over a period of years, and (b) protective tariffs against supplies from pre-war producing countries. The present difficult economic and political conditions and the impossibility of knowing or forecasting the economic circumstances and political considerations that may operate at the end of the war make it impracticable and inadvisable at the moment to formulate any proposals involving such questions. The committee strongly recommends that the position should be further considered as soon as possible after the end of the war.

Short-term Group

Here the position is quite different. Supplies can be rapidly created and producers can recoup themselves during the war. After the war stocks may come on the market from countries now cut off from international trade, which may create serious difficulties for growers in the United Kingdom who may have considerable stocks on hand at the cessation of hostilities. Therefore, so far as production in the United Kingdom is concerned, it is suggested that H.M. Government might consider safeguarding the position of persons who have undertaken the cultivation of drugs, in the same way as is being done in other branches of agriculture. It is hazardous to grow these plants in climates or soils whose suitability has not been clearly tested by experience, and it is preferable to expand production in areas where the plants are already grown and collected. Much could be achieved during the war by intensifying the collection of wild plants and developing the use of related species or substitutes

Production of Vegetable Drugs in the U.K.

The committee considers that attention should be concentrated on the following drugs.

Agar	Ergot	Psyllium
Dill	Male fern	Sphagnum moss
Belladonna (leaf and root)	Liquorice root	Stramonium
Irish moss	Hyoscyamus	Dandelion root
Colchicum	Peppermint	Valerian
Digitalis		

Arrangements have been made by the Ministry of Health for regular growers in the United Kingdom to extend the areas under cultivation of certain extremely important drugs, which with other steps taken to secure supplies, ensures that the wartime requirements of these are safeguarded.

The committee points out that while the development of organized collection of herbs growing wild is most valuable and should be encouraged, the *growing* of medicinal herbs is a highly specialized industry which is not without its dangers to the inexperienced and that therefore growing by amateurs is to be discouraged. Considerable experimental work is being done at research institutes and agricultural stations on strains, seed production, growing, and utilization of various drugs, the results of which may be important. Steps have already been taken to encourage methodical collection, proper drying (which is most important), and marketing of drugs growing wild in this country.

Cultivation, Collection, and Marketing

During 1940 the Ministry of Health was engaged in correspondence with amateur growers and collectors regarding cultivation, collection, and marketing of vegetable drugs, and held several conferences with trade representatives. The Department also sponsored, in co-operation with the Ministry of Agriculture and Fisheries and the Board of Education, a

Press notice regarding cultivation of a limited number of vegetable drugs. The outcome of this correspondence and consultation was an arrangement whereby private growers and collectors disposed of their crops through trade channels.

The stimulation of interest in the supply of vegetable drugs in the United Kingdom has been carried further by the Royal Botanic Gardens, Kew, working in co-operation with the National Federation of Women's Institutes, Boy Scouts and Girl Guides organizations, and the trade.

The Royal Botanic Gardens have arranged with the National Federation of Women's Institutes to organize the collection of ten essential or important herbs in each county, a total of thirty herbs throughout the country. The agricultural organizer of the Federation is issuing circulars of instructions, and articles will appear in the *Journal of Botany* at the collecting season. Arrangements were made during 1940 by the Department of Health for Scotland and the British Red Cross for organized collection of sphagnum moss, and it is hoped now to collect increasing quantities not only in Scotland but also in other parts of the United Kingdom. The sponsors of these schemes hope that the arrangements made will avoid the disappointment experienced in the last war when so much of the amateur effort was wasted owing to incorrect methods of collection and inadequate preparation for the market; and that they will add substantially to the quantities of essential vegetable drugs available. Miss Barbara Keen and Miss Jean Armstrong have written an illustrated booklet entitled *Herb Gathering*, which will shortly be published by Messrs. Brome and Schimmer, 4, Leather Market, S.E.1, at 9d. Attention is also drawn to Bulletin No. 121 of the Ministry of Agriculture, *Medicinal Herbs and their Cultivation* (H.M. Stationery Office, 6d.).

Production in the British Empire

The committee notes with satisfaction that during the past twelve months the Ministry of Health has received many inquiries, offers of help, and details of experimental work being carried out, from Canada, Australia, New Zealand, East Africa, India, and elsewhere. Some of this experimental work has already indicated possibilities of important alternative sources of supply for some drugs normally obtained from outside the Empire. Consideration was given to the production in respect of argol, agar, wood creosote, datura leaf, ephedra, liquorice root, santonin, and squill; and arrangements have been made for inquiries to be instituted by the Imperial Institute, the Colonial, Dominions, and India Offices. A comprehensive and valuable memorandum by M. Ashby, Ph.D., on "War Time Drug Supplies and Empire Production," was published in the *Bulletin of the Imperial Institute*, Vol. 39 (1941) No. 1.

A subcommittee has been set up at the Ministry of Health to act as a clearing centre for information and advice.

LEPROSY IN THE BRITISH EMPIRE

The annual meeting of the British Empire Leprosy Relief Association was held at the India Office under the chairmanship of Lord Lugard. Sir WILLIAM PEEL, chairman of the Executive Committee, said that owing to the war the projected tour of the medical secretary, Dr. E. Muir, to the West Indies and South America had been postponed, but a fortunate turn of events had now made it possible. The Government of Trinidad had requested the services of the Association in finding a suitable medical man to take charge of the leper asylum in that colony, and Dr. Muir had been accepted for the post on the understanding that his term of service would not exceed eighteen months, and that permission would be given to visit and report upon the position in respect of leprosy in certain other West Indian colonies and in other places. Sir William Peel went on to say that while the Association continued to carry on its work with a fair measure of success the great problem of leprosy still remained unsolved, and no marked reduction in the incidence of this terrible scourge had been effected. In many colonies there were other more lethal diseases the prevention and treatment of which taxed the financial resources to such an extent that leprosy had been forced into a secondary place.

Infection and Segregation

Sir LEONARD ROGERS, who serves as acting medical secretary in Dr. Muir's absence, said that epidemiological studies had revealed that 80% of infection arose in the households of leprosy cases, mostly through infection of children, and that nineteen out of every twenty infections were derived from prolonged contact with the much more infectious skin or lepromatous type, and only one from nerve cases. This had led to the release as uninfective of one-third of the cases segregated in South Africa. In a badly infected area in the Southern Sudan over half the 7,000 cases moved to large agricultural colonies had also been cleared of all symptoms of active disease. In Nigeria, the most seriously infected of our colonial possessions, within ten years the patients, mostly infectious, isolated and treated under a purely voluntary system in large agricultural colonies, had increased from 2,500 to nearly 7,000. Little progress had been made during the last few years in discovering a curative treatment for all stages of the disease, but a new oil, closely resembling hydnocarpus oil in its chemical formula, was now being tested, and it was on such chemotherapeutic lines that progress was most likely to be made.

In reply to Sir FRANCIS FREMANTLE, who asked whether the statement that there was no sign of lessened incidence of the disease was correct, the CHAIRMAN said that undoubtedly cases were cleared, but new cases came to light in equal number, and thus the incidence was maintained. The annual report adopted by the meeting showed that the number of workers actually in the field included four doctors, fourteen lay workers, and one nurse.

AWARDS FOR GALLANTRY IN CIVIL DEFENCE

The appointment of Mr. F. D. Murphy, F.R.C.S., senior resident surgeon, Fulham Hospital, to be an O.B.E. (Civil Division) is announced in a *Supplement* to the *London Gazette* dated May 30, 1941.

Mr. FRANCIS DOMINICK MURPHY: "When the Fulham Hospital suffered direct hits from high-explosive bombs, Mr. Murphy displayed marked efficiency and coolness and set a splendid example to the patients and the staff. In extremely difficult and dangerous conditions he personally directed the transfer and evacuation of patients and throughout showed courage and determination."

Dr. J. D. Dillon, medical officer in charge, Mobile Unit, Greenwich; Dr. D. Millar, medical practitioner, Glasgow; Dr. J. S. McL. Ord, police-surgeon, Glasgow City Police; Cecilia McGinty, district nurse, Glasgow; and Dr. H. Glyn-Jones, medical officer, American Mobile Unit, Lambeth, have been awarded the M.B.E. (Civil Division). The announcement in the *Supplement* to the *London Gazette* dated June 6, 1941, reads as follows:

Dr. JOHN DESMOND DILLON: "Dr. Dillon, during the whole period of his association with the casualty services, has rendered splendid service. On one occasion a casualty was trapped in the basement of a building the upper storey of which was blazing. Quite regardless of risk to himself, Dr. Dillon went down amidst the wreckage in order to extricate the casualty. Water heated by the fire was streaming down into the debris, but the doctor crawled through, reached a boy and administered morphine. Dr. Dillon was himself at the time of this incident a casualty, for earlier in the evening he had been injured when extinguishing an incendiary bomb."

Dr. DANIEL MILLAR, Dr. JOHN SMITH MCLAREN ORD, and CECILIA MCGINTY: "A tenement building was partly demolished by a high-explosive bomb. Rescue workers tunnelled through to a trapped person and Dr. Millar administered morphine to him. Dr. McLaren Ord arrived and it was decided to amputate the man's foot in order to release him. With Nurse McGinty the doctors entered the tunnel and Dr. Millar performed a forty-minute operation, the anaesthetic being given by Dr. McLaren Ord, assisted by Nurse McGinty. During the entire period the remaining part of the building was on the point of collapse and occasional falls of wreckage took place. By their gallant action, performed at great personal risk, the doctors and nurse succeeded in extricating the trapped man."

Dr. HAROLD GLYN-JONES: "A bomb demolished a large building and the occupants were trapped. Every service combined to extricate the victims, and the driving of tunnels into the shaky mass of masonry and girders led to the rescue alive of many casualties. Throughout the rescue period of nine hours Dr. Glyn-Jones was indefatigable. At much personal risk he crawled down tunnels to give morphine and temporary treatment to the wounded, and his courage and determination were alike outstanding. He received the greatest help from Wilfred John Clarke, sergeant, A.R.P. Stretcher Party, Lambeth (awarded the British Empire Medal (Civil Division)), and Norman Jaeger, leader, A.R.P. Stretcher Party, Lambeth (awarded a bar to the British Empire Medal (Civil Division)), whose fearlessness, like that of the doctor, was a conspicuous example to others. The efforts of Dr. Glyn-Jones and of the two stretcher-bearers were instrumental in saving many lives."

Local News

ENGLAND AND WALES

The Red Cross and the Civilian Population

The civilian injured by enemy action is now, as the soldier has long been, the recipient of Red Cross help. This extension of the work of the Red Cross was brought to notice in a paper read before the Royal Society of Arts by Major-General Sir John Kennedy, vice-chairman of the executive committee of the British Red Cross and St. John War Organization. At the time of the Battle for Britain last autumn while the Government and local authorities were organizing machinery to relieve civilian distress, the Red Cross, he said felt it its duty to come to the immediate aid of civilians A sum of a quarter of a million was placed at the instant call of the officers of the organization in the various counties, and they were told to use it without undue formalities to meet the immediate needs of those who had suffered Special services included the giving of information to relatives and arrangements for the latter to visit the patients in hospital : the commissioning of a fleet of 170 ambulances for use particularly in air raids, in addition to the 200 Red Cross ambulances already attached to the Home Commands : and the admission of civilian as well as Service convalescents to the auxiliary hospitals and convalescent homes which have been established in this country with accommodation for 20,000 beds. Another phase of Red Cross activity is of enormous importance in fortifying civilian morale In this war members of detachments of the British Red Cross and the Order of St. John numbering some 300,000 have been called upon to volunteer for other duties than hospital service As fully trained men and women they entered the A R P services, which then consisted mostly of volunteers who were unqualified and inexperienced, though eager and willing enough. In doing so these Red Cross workers relinquished their distinctive designation, exchanging their more famous emblem for the A.R.P. badge. "One reads of the exploits of the A.R.P. services," said Sir John Kennedy "but it is only we who know from the reports which we receive how much of the credit could rightly be claimed by detachments of the British Red Cross Society and the Order of St John These men and women have manned first-aid posts, formed the crews of mobile units, served as stretcher-bearers, driven ambulances, staffed rest centres, rescued wounded and injured and aided doctors in emergency treatment, all in the midst of the fiercest assaults to which the population of this country has ever been subjected.

Medical Sickness and Life Assurance

The annual general meeting of the Medical Sickness, Annuity and Life Assurance Society, Ltd., was held in London on May 5, with Dr. F. C. Martley in the chair. In moving the adoption of the accounts Dr. Martley said that the head office had been destroyed by enemy action, but there were no casualties among the staff and the records had already been removed to the society's registered office at Highfield, Chesterton, Cirencester. New business during the year had been at about 40% of the pre-war figures. In both the life and the sickness departments the claims were heavier, due in the former to war claims and in the latter to the serious epidemic of influenza in the early part of 1940. A further £50,000 had been transferred to the War Emergency Reserve Fund, making the total £150,000, which it was hoped would suffice to provide for the heavy fall in the value of assets. All surplus moneys went into British Government securities, the holding in which had been increased to £387,366. The quinquennial valuation was due at the end of 1941, and while hopeful of satisfactory results, he must utter a word of warning to members not to be too-hopeful of bonuses. All resources must be conserved to meet the commitments and liabilities in view of the uncertain condition of affairs in the world in general. A recommendation of the Board was adopted to the effect that no interim bonus be paid on with-profit policies for permanent sickness and accident insurance and life assurances for the year 1941, but that interim bonuses for the years 1937, 1938, and 1939 be paid on all such policies becoming claims during 1941. The report of the directors stated that the new sums assured in the Life Assurance Fund totalled £154,290, with an annual premium income of £4,015. The claims paid were £42,647. Premium income amounted to £147,051, and the rate of interest earned on this fund was £3 5s. 3d.% after deduction of tax. The new annual premiums in the Sickness Fund totalled £4,575, and £67,895 was paid in claims : the premium income amounted to £129,910, and the rate of interest earned was £3 6s 9d.%, again after deduction of tax The total funds now amounted to £2,181,752.

CANADA

Scientific Research in Canada

Lieut.-General A. G. L. McNaughton, general officer commanding the 1st Canadian Corps Overseas Force, is also president of the National Research Council of Canada, and in the latter capacity gave an address before the Royal Society of Arts on May 13 on the subject of research in the Dominion. The organization of research in Canada as a function of government dates back to the last war, when the example of the home country was followed and an advisory council for scientific and industrial research was established. It was not contemplated at that time, said General McNaughton, that the council would establish laboratories of its own ; it was to act as an agency for consultation and co-ordination between those already carrying on research in the existing laboratories of the several departments of the Dominion and Provincial Governments, of the universities, and of industry. By 1932, however, the council, now the National Research Council, had its own laboratories, and in 1939 its annual budget was one million dollars. In Canadian industry there were, on the eve of the present war, over 1,000 laboratories with 2,500 full-time professional workers The council has developed close relations with every branch of science in Canada, with the universities, with the Government Departments concerned with research problems, and with the great professional societies in medicine and other fields. General McNaughton mentioned a few fields of research to illustrate the wide range of work carried on, especially in agriculture and forestry, and in chemistry, physics, and engineering A system of assisted researches has been instituted whereby professors in charge of university departments may be given financial assistance for the provision of needed apparatus and laboratory help. No attempt has been made by the council to monopolize research, in fact it has encouraged research in the universities and elsewhere Much work has been done through associate committees, which direct co-operative research on the problems assigned to them. One such committee is on aviation medicine. This was under the chairmanship of the late Sir Frederick Banting and it was while carrying out the very important programme of work planned by this committee that Sir Frederick Banting lost his life in a flying accident. The loss of such a great leader in this and other important research work is greatly mourned in Canada and in scientific circles all over the world, but his work, said General McNaughton, would live, as his committee would see to it that the many projects he initiated would be continued. General McNaughton added that all this research work in Canada was going forward in closest consultation with the authorities in Great Britain and with their mutual friends and colleagues in the United States.

Canadian Blood Serum for Britain

Blood serum, prepared at Toronto University in a laboratory equipped and financed by the Canadian Government, is to be shipped to Great Britain for use in the treatment of air-raid casualties. The serum, prepared from the blood of voluntary donors, was first distributed to the Canadian Forces in Canada and the United Kingdom, but the Department of Pensions and National Health, in agreement with the Department of National Defence, recently informed Mr. Malcolm MacDonald, United Kingdom High Commissioner in Canada, that they were able, if desired, to begin shipments as a gift to the United Kingdom Government. This offer has been accepted with gratitude, and 500 bottles of serum, each sufficient for one administration, are to be sent to the National Institute for Medical Research, London. It may be possible to arrange for small shipments by air. Mr. MacDonald has been asked to convey to the Canadian Government the cordial appreciation of the United Kingdom authorities.

Reports of Societies

TRAUMATIC SHOCK

At a meeting of the Manchester Pathological Society held in the Medical School on May 14, with the president, Dr. A. HILLYARD HOLMES, in the chair, Prof. J. H. DIBLE gave a lecture on "Some Aspects of Traumatic Shock."

Prof. Dible, who defined shock as a condition of low blood volume, discussed the lines along which the present position of our knowledge of shock had been reached. He outlined the historical development of our knowledge, and the theories which had been propounded during the last war, leading up to the traumatic toxaemia theory of Bayliss and Cannon and the view that the active substance might be histamine. He reviewed the work of Blalock, Simonart, Macdonald and Holt, and O'Shaughnessy and Slome, and the evidence which stressed the importance of the local effusion in the genesis of shock. The influence of the nervous system and that of the suprarenal cortex were also discussed. On the clinical side, the differentiation of various factors which contributed to the condition of low blood volume was considered and the findings described in examples of the different types.

Finally, the syndrome recently described by Bywaters and Beall and others[1] in which anuria and uraemia follow crush injuries with recovery from the immediate shock was discussed at some length. The anatomical changes in the kidney were described and the similarity of the picture to that seen in other examples of intense intravascular haemolysis, such as blackwater fever and incompatible blood transfusion, was emphasized. Prof. Dible expressed the opinion that the important renal change was one of intense catarrh affecting the whole nephron and leading to an excessive filtration and reabsorption of the glomerular filtrate. The pigment in the urine in this condition did not appear to be haemoglobin; there was, however, extensive muscular necrosis, and recent work at the British Postgraduate Medical School has adduced evidence that it was myohaemoglobin.

[1] *British Medical Journal*, 1941, 1, 427.

Correspondence

Relationship of Patient and Doctor

SIR,—May I stress—in a different connexion, and especially for the consideration of the Medical Planning Commission—two clauses in the summary and conclusions of the Goulstonian Lectures (*Journal*, June 7, p. 850). Dr. Paul Wood there says that treatment of Da Costa's syndrome in the Army is shackled "by the difficulty in establishing intimate contact with a patient who did not choose his medical confidant" and "by the duty of having to serve the State first, the patient second." He thus illustrates and confirms the importance of two essentials of a general practitioner medical service as they have been stated in B.M.A. policy—free choice of doctor and the preservation of the relationship of doctor to patient as prime and predominant, not subordinated to any other. Both these essentials have been disputed, and each has sometimes been injudiciously defended. There are, no doubt, many cases of individual illness in which free choice of doctor is unimportant as regards recovery; and it is both unnecessary and untrue to depreciate the work of salaried medical officers owing loyalty to councils, committees, or superior officers. But broadly, as principles underlying any general medical service for the nation, the immense value of these two factors cannot properly be disputed unless all experience and tradition of medical practice are found to be false.—I am, etc.,

Mudford, Yeovil, June 7. HENRY B. BRACKENBURY.

Ship Surgeons and the Medical Personnel on Military Transports

SIR,—This, I hope, is not an inopportune time to draw attention to the position which ship surgeons hold in the passenger ships which have been taken over and are now used as H.M. Transports.

Ship surgeons are engaged by the shipping company and are approved by the Board of Trade, and they normally enjoy in the ship and amongst the passengers a status and position second to no one on the ship's staff. But since the vessels have been put into service as military transports his status on these boats tends to become secondary and subsidiary, and from being in a position of trust and confidence responsible for the health and welfare of all on board, the ship surgeon now finds himself relegated to a narrow sphere, where he is permitted, as it were by an act of grace, to carry on. This limitation of his activities is due to the attitude of those who frame the regulations governing sea transport and who, with very little regard for the attainments, rights, and duties of the ship surgeon, transfer to the Service medical officers the charge of everything connected with the health of the vessel.

Let me quote from Voyage Regulations, 1935 (published 1940), para. 201, page 54: "The S.M.O. will take sanitary and medical charge of the ship and crew, and will frequently inspect the quarters occupied by the crew, and will frequently call the attention of the Master and the O.C. troops to any neglect of sanitation." There is little need to comment on this; it leaves no room for ambiguity or doubt, and all the subsequent paragraphs defining the duties of the S.M.O. equally ignore the position of the ship surgeon, with the exception of one significant paragraph, to which I shall presently refer.

Here I may say a word about the appointment of the senior medical officer. Sometimes he is chosen from the medical officers who are travelling with their units, and with these men I am glad to say my relations have always been cordial. At other times—and this is now becoming the established custom—an S.M.O. and assistant M.O. are appointed permanently or semi-permanently to the larger ships. It is usually here that the points of conflict arise. He has official sanction for the view that he supersedes the ship surgeon, who like some obscure star dances round the more majestic orb. I shall cite from my own experiences some of the unhappy consequences accruing.

I did a long journey to the Far East with a gentleman who was benevolent enough to inform me that I should be "allowed to look after the crew." And when a member of the crew died he ordered me, as my "superior officer," to change the diagnosis I had entered in a ship's official document from "heat exhaustion" to "heat stroke." Incidentally, he had not seen the patient; he had never seen a case of heat stroke; I had seen several. And the document in question did not concern him in any way.

This may seem an example of an extreme case, but I have heard of instances of tactlessness and aggression equally unfortunate. Such a state of things is hardly tolerable; it is unfair to a man in his own ship. And while the existing regulations stand, with all the emphasis in the interests of one party, difficulties are constantly liable to arise, and only the exercise of great patience can ensure that the relationships shall be tolerably friendly.

Perhaps it would not be out of place to make a few comments on the status of the S.M.O. in his relations with his brother officers on board. If he is the type who likes to assert his authority by taking control of their patients, his relations with the various medical officers in charge of the units are not likely to be happy. It is a bad arrangement on both sides. And if he finds himself in contact with a homogeneous unit such as a field ambulance, these specially selected men are not likely to be passive under the struttings of a person who is in every way their intellectual inferior. And as to his relationship with colonial troops and doctors—well, it is a point that I need not labour. Such things I have seen and observed.

Finally, may I be permitted to question the wisdom of keeping two military medical men permanently on board the larger ships and one on the smaller vessels, numbers which amount to a very large total in the aggregate, at a time when at home, in London and the Midland cities, there is a crying need for doctors. Several of the S.M.O.s with whom I have spoken share this opinion very emphatically; they feel that their services are superfluous, to say the least of it.

I shall now quote para. 220, page 58, from the Voyage Regulations to which I have already referred: "If, owing to exceptional circumstances, there is no military medical officer on board a transport or freightship, military passengers will be warned that, except in cases of voluntary passengers will inoculation of officers and their families, no fees whatever should be paid for attendance by the civilian ship surgeon." "Warned," I take it, against the dishonesty and cupidity of the ship surgeon, who is apparently liable to importune for

fees, in spite of the fact that when he assumes charge of military personnel full instructions are handed to him regarding the scale of remuneration and the submission of his claim for payment—instructions which leave no room for ambiguity or doubt. When first I heard of this "warning" from some officers I thought they spoke in jest; that they were leg-pulling, in fact. I do hope that something more expressive of an arrangement between gentlemen will soon take the place of this tendentious paragraph.

I have touched on some of the disadvantages under which the ship surgeon now labours. But it ought not to be beyond the wit of man to devise some arrangements which would recognize his position and status, acknowledge his usefulness, and make a proper employment of his services. At present he is merely the crew's doctor, with duties that are trifling. It tends to be a dull life, and all the praises poured forth on the air about the self-sacrifice of seafaring men, though gratifying, do not quite make up for it. In addition to this he has suffered a considerable diminution in income since the cessation of the passenger traffic—a matter of no light moment in many cases.

In this account I hope I have not been over-critical or censorious. It has only been my intention to point out some very real grievances, and I do so all the more willingly as I am only temporarily a ship surgeon and I feel therefore that I can speak disinterestedly on behalf of a large body of men who are not obtrusive or clamorous in their claims but who wish to be allowed to maintain their self-respect on their ships, and who ought not to be impeded, harassed, or penalized in any unnecessary or gratuitous manner.

Should this letter evoke any correspondence I am afraid that I shall not see it for some four or five months.—I am etc.

JAMES PRENDERGAST
Ship Surgeon.

Liverpool, May 15.

Undergraduates Training in the Municipal Hospitals

SIR,—The correspondence in recent issues of the *Journal* gives a very inadequate picture of the extent to which facilities for undergraduate teaching were provided in the L.C.C. hospitals before September, 1939.

(1) Arrangements made with the deans of the several medical school hospitals in London were in operation for some years prior to 1939 for the provision of facilities for medical students from every one of the medical schools to be attached to one or more L.C.C. hospitals for their midwifery work. It is no exaggeration to say that had it not been for the facilities provided at L.C.C. hospitals it would have been impossible for London medical students to comply with the requirements of the General Medical Council.

(2) Similarly arrangements were in operation for some years by which every medical school hospital was attached, for the purposes of clinical instruction at the bedside, to one or more L.C.C. hospitals. This meant that on one or more afternoons each week from each medical school a group of medical students selected by their own teachers went to an L.C.C. hospital and there saw patients specially chosen for the demonstration and were taught by their own teachers.

(3) Arrangements were also made for the provision of teaching facilities at some of the L.C.C. special hospitals, notably at St. Margaret's Hospital, North St. Pancras—the only hospital in London where it was possible to teach not only medical students, but also graduates, certificated midwives and pupil midwives, all about ophthalmia neonatorum—quite one of the rarest diseases to be seen nowadays in any other London hospital. If it were not for St. Margaret's Hospital practically every medical student and every pupil midwife in London would go into practice without ever seeing a case of ophthalmia neonatorum and how to treat it.

(4) It is unnecessary to dwell upon the facilities provided at the L.C.C. fever hospitals because they are well known to everyone, but it is not so well known that at L.C.C. hospitals there were in peacetime by far the most extensive series of specialized "units" to be found anywhere in this country—for example, fractures of all kinds, plastic surgery, thoracic surgery, thyroid disease, poliomyelitis, encephalitis, pernicious anæmia, epilepsy, congenital syphilis, orthopaedic cases, etc., etc.—but unfortunately little advantage was taken of the marvellous opportunities available at these specialized units for undergraduate or postgraduate study.

It remains for me to add that in actual practice, though all these advantages for the teaching of the medical student were freely available and largely taken advantage of by the deans of the medical schools, there was one outstanding practical difficulty which we had not quite overcome but which I am sure could and should be overcome when war is over and we are able once more to turn our attention to the training of the medical student and many other allied problems. The difficulty was that as a rule the staff of the medical school hospital quite naturally wanted to teach their own students at the L.C.C. hospitals. No great objection was taken to this procedure by the L.C.C. hospital staff, although it is obvious on the face of it that the teachers from the medical schools could not teach properly on patients they knew very little about and furthermore it was not easy always to avoid saying something at the bedside which the patient might interpret as a criticism, quite unintentional, of the diagnosis and treatment by the L.C.C. medical officer in charge of the case. Much more could be said on this difficulty but space will not permit, and therefore I content myself with the suggestion that one way of overcoming this difficulty is for an arrangement to be made in future whereby the teaching staff of the medical school hospital attached to an L.C.C. hospital or hospitals, should become the consultant staff of the L.C.C. hospital. This would enable the staff of the medical school hospital and L.C.C. hospital to work together in still greater and more harmonious co-operation and for the medical school teacher to be thoroughly familiar with the clinical condition of the patients upon whom he proposes to teach. The other alternative, and one which could often be adopted, would be for the medical student when visiting an L.C.C. hospital to be taught by the L.C.C. medical officer and for that officer (or officers) to become an honorary member of the medical school teaching staff. Possibly a combination of both schemes would be best of all. In certain of the L.C.C. special hospitals or specialized units the only possible teacher would be the L.C.C. medical officer.—I am, etc.

FREDERICK MENZIES.

Criccieth, June 1

Cut Flexor Tendons

SIR,—In your issue of March 15 (p. 417) Mr. H. Blacow Yates advised amputation as the best means of securing an early return to work in cases of flexor tendons which have been divided within their digital synovial sheaths and in which a rapid recovery is of national importance.

It is admitted that the suture operations, whether primary or delayed, as at present practised rarely restore normal function. Nevertheless, I submit that some of these urgent cases for which amputation is recommended would be better-treated by a deliberate fixation of the tendon to the digital sheath provided that the degree of permanent flexion of the interphalangeal joints obtained permits of satisfactory opposition to the thumb, and that the scar is lateral so as to avoid trouble from pressure. Many cases in which suture has been attempted are discharged with a stiff but useful finger if flexed at these joints, and with less disability than if amputation had been done. There are some occupations in which a fixed flexed finger would prove a severe handicap, and in these primary amputation is the best procedure. Of course, in the case of the thumb conservative measures are almost always preferable to amputation.

Concerning the level at which amputation of the fingers should be performed for lesions of the flexor profundus tendon, this should be just proximal to the distal interphalangeal joint, and the resulting disability is only slight.

For lesions affecting both deep and superficial tendons the level will depend on the finger involved. In the case of the index the whole finger should be removed and, preferably, in addition an oblique portion of the metacarpal. Dr. H. A. Haxton, on the same page of the *Journal*, referred to the advantages of such a procedure: the patient rarely uses the stump consisting of the first phalanx, if remined, but prefers to employ the middle finger instead and not infrequently finds the stump a nuisance. For the middle and ring fingers it is advisable to amputate through the head of the first phalanx, as the stump not only adds to the strength of the grip but also prevents deviation of the adjacent fingers. The loss of the little finger is not serious, but when strength rather than appearance is the object it is better to amputate through the head of the first phalanx; otherwise the procedure should be as for the index.

It should be possible to evolve a technique for suture within the flexor sheath and after treatment to produce a high percentage of successful results, and Mr. Blacow Yates has done a valuable service in directing attention to the present unsatisfactory position, especially as this leads to so great a loss of valuable time.—I am, etc.

PHILIP HAWE, Ch.M., F.R.C.S.,
Lieut.-Colonel R.A.M.C.

Treatment of Injuries of the Fingers

SIR,—From time immemorial medical students have been taught that when dealing with injuries of the fingers their watchword must be "Save all you can," and this advice lingers, copied from paper to paper and textbook to textbook. Quite recently no less distinguished a surgeon than Sir John Fraser has given his authority to this fallacious teaching in a memorandum circulated by the Department of Health for Scotland. Sir John dismisses the subject of amputations of the fingers with the advice that "the utmost conservatism must be exercised; a functioning digit or any portion of it should be preserved if possible." Blind adherence to this policy of undiscriminating conservatism has condemned untold numbers of patients to months of painful dressings and disability and to repeated operations in a useless endeavour to save part of a finger which should have been amputated at the start.

In the *Journal* of March 15 (p. 417) you published two letters in which the policy of conservatism was challenged: Dr. H. A. Haxton questioned the value of a short index stump and advised amputation through the shaft of the metacarpal; Mr. H. Blacow Yates questioned the efficacy of suture of the flexor tendons within their digital sheaths and suggested that a primary amputation would be better treatment. I have expected each week to read an angry reply to these heresies, but as none has appeared I am emboldened to suggest that there are many other indications for radical treatment in dealing with finger injuries.

Every bit of the thumb is valuable and none may be sacrificed, but in the case of the fingers it is unfair to the patient to attempt to save, or to continue conservative treatment of, a finger which is doomed to be permanently stiff, useless, or painful. Immediate amputation is therefore indicated in the following circumstances: (1) Crushed fingers in which the finger-tip is ischaemic. (2) Compound fractures of the middle or proximal phalanges in association with severed tendons. (3) Comminuted fractures of two phalanges with a shattered joint between them. (4) Compound fractures of terminal phalanx involving the joint. (5) Finger wounds with extensive skin loss. These injuries almost always result in stiff useless fingers. Only if several fingers are involved is it worth while attempting to avoid amputation by the immediate application of skin grafts. (6) The finger ankylosed in extension is a nuisance to the patient and a reproach to the surgeon; no time should be wasted before removing it. (7) Division of the flexor tendons within their digital sheaths. Like Mr. Blacow Yates, I have never seen a good result following suture, and consider that immediate amputation is the best treatment.

In determining the level of amputation the following points should be remembered:

(1) The bone end must be covered with good skin and without tension.

(2) The scar should not be terminal and should not be on the palmar surface unless this is absolutely unavoidable.

(3) The loss of part or all of the terminal phalanx is no handicap, except in certain special occupations.

(4) The amputation of all or part of the proximal or middle phalanx of the index finger leaves a stump which is a nuisance. If amputation higher than the terminal phalanx is necessary it is better to sacrifice the whole finger and make the amputation obliquely through the metacarpal shaft.

(5) Amputations through the proximal or middle phalanges of the middle or ring fingers leave stumps which usually are useful.

(6) Amputations proximal to the web of a finger or disarticulations at the metacarpo-phalangeal joint should be avoided; they leave ugly stumps which get in the way and the fingers on either side become adducted. Instead, amputate about 3/4-inch proximal to the joint, through the shaft of the metacarpal.

(7) Loss of part or all of the little finger causes but slight disability. Unless all or the greater part of the middle phalanx can be retained it is better to amputate obliquely through the shaft of the metacarpal.

These "rules" are based on personal experience and observation. They are brought forward in the hope that they may stimulate discussion on the very important but neglected problem of finger injuries. Out of the experience of surgeons who have seen a large number of these cases, and from the records of insurance companies, it should be possible to formulate a set of rules that would be generally acceptable.—I am, etc.,

J. B. OLDHAM.

May 30.

Treatment of Osteomyelitis

SIR,—Chronic osteomyelitis will, I believe, prove to be one of the most serious surgical problems of the war, for at least two reasons; first, it is a common result of gunshot wounds of bone; and, secondly, we do not appear to have made much progress in the treatment of this condition. Cases are still attending hospitals for dressing and occasional scraping of sinuses resulting from wounds of the last war; twenty-five years of dressings is not a unique history. Chemotherapy does little to help, which is what one would expect. The avascular nature of the lesion makes it unlikely that drugs will reach the focus even if they were likely to be useful there.

The treatment of acute osteomyelitis has ranged from gutter-ing to the extremes of diaphysectomy on the one hand and to drill holes on the other. Closed-plaster methods have helped greatly in the acute condition, but do any of these methods prevent the condition passing into the chronic phase? If the infected bone is in such a position that a shallow saucer-like depression can be cut out of the bone and the space so formed filled with a muscle-graft, healing may be permanent, but take a by no means uncommon case—chronic osteomyelitis of the lower end of the femur without sequestrum formation: what can one do for this condition? I have known such a condition remain healed and apparently cured for seven years, and then the disease break out so violently with two pathological fractures that amputation at the hip-joint had to be performed as a life-saving operation. Would a patient with chronic osteomyelitis of the lower end of the femur be better off with an amputation and an artificial leg?

My real objects in writing this letter are three: (1) To remind us all of this problem and to bring it especially to the notice of those on the threshold of their surgical career. (2) To gain what information I can regarding the progress of treatment of this malady. (3) Most important of all—to plead for some centre or colony for pensioners whose wounds have produced this condition, where a concentration of thought and effort for this particular purpose would be available, and where the degenerative and depressing effects of chronic invalidism could be mitigated by occupation and industry suitable to the disabilities of the workers, as has been done in other conditions—e.g., at Papworth. Now is the time to start such a scheme if "planning ahead" is no idle phrase.—I am, etc.,

H. J. MCCURRICH.

Hove, June 2.

Obscure Nervous Effects of Air Raids

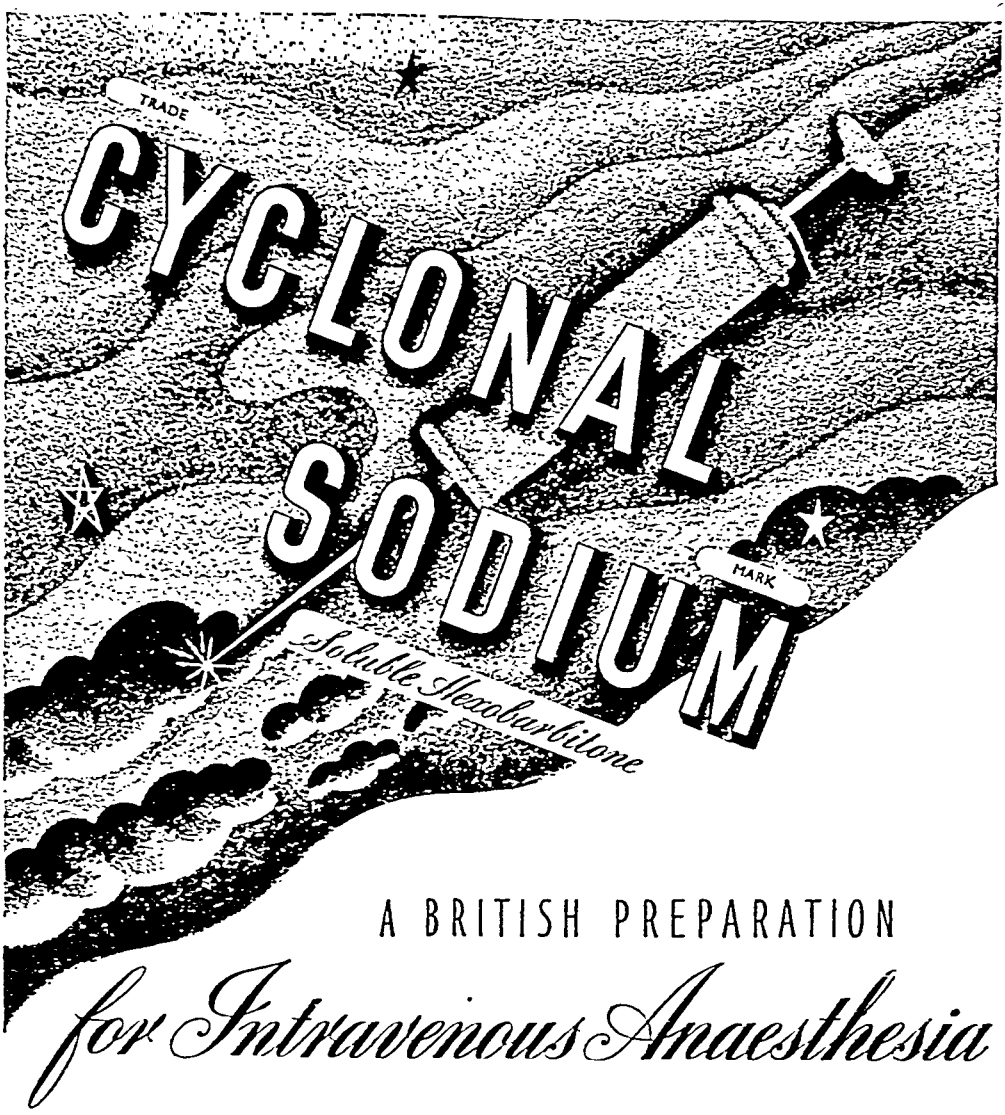
SIR,—Mr. Tom Harrisson's second letter (May 31, p. 832) prompts me to venture on a disclaimer. The aetiology I suggested in my letter of April 26 (p. 647) was intended to apply to a specific syndrome, as I understand it from the original description. I agree with Mr. Harrisson that there is throughout the profession a "tendency to gloss over the serious psychological effects that air raids have on people," and to insist that the neurotic effects are negligible." I would be sorry if Mr. Harrisson imputed this tendency to me.—I am, etc.,

H. CRICHTON-MILLER.

London, W.1, June 1.

"Egyptian Tummy"

SIR,—From my experience in Egypt for four years, including the summers, I, with others, suffered from this really trouble-some disease. It occurred in the hot weather as well as at other times, and in common with others, I attributed it to food infection, as it recurred in many people and as no one could be sure of the food they consumed. I can only say that, while chill may conceivably aggravate it, in the main it could not be the cause of those violent attacks of vomiting.



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VITAMIN THERAPY

THE PROTECTIVE FACTORS IN PREGNANCY AND LACTATION

Even under the most favourable circumstances, pregnancy, labour and lactation make considerable demands on the mother. Ante-natal care has, therefore, the dual object of preventing the disorders to which she is especially prone and of building up the reserves of the healthy body by advising her about her diet. Although we know that the quantity of food need not be increased, the qualitative requirements rise considerably in the case of some of the protective factors.

RECTIFYING THE DEFICIENCIES

Surveys made within recent years have shown the great prevalence in the ordinary diet of deficiencies of most of the vitamins as well as of calcium and iron. Expectant and lactating mothers are, therefore, particularly liable to suffer; and the effects, sometimes latent in them, will be reflected in their infants.

Pregnavite affords the most convenient and economical means of supplementing the pregnancy diet with vitamins and mineral salts (*see table below*). Its wide range of protective factors makes it the best means of increasing the mother's reserves.

PERFECTING THE BREAST MILK

A satisfactory flow of breast milk is of the first importance, but where the mother's diet is low in protective factors the milk is low in them also. Additional cow's milk, which is widely relied upon, supplies vitamin A and calcium satisfactorily. It is, however, poor in iron, vitamin B and vitamin C. A deficiency of vitamin B_1 in the breast milk results in poor appetite in the infant and opens the way to a series of digestive disturbances. The breast-fed baby also often relies entirely on its mother for vitamin C, for which she has been accustomed to taking fruit.

Enriching the mother's diet with vitamin B_1 and vitamin C is rapidly followed by an increase of these factors in the milk.

Pregnavite in recommended doses supplies :—

VITAMIN A ..	4,000 i.u.	CALCIUM ..	350 mg.
VITAMIN B_1 ..	200 i.u.		
VITAMIN C ..	400 i.u.	PHOSPHORUS ..	550 mg.
VITAMIN D ..	300 i.u.		
VITAMIN E ..	2 mg.	AVAILABLE IRON	12 mg.

PREVENTING ABORTION

The use of wheat germ oil in the treatment of cases of sterility and habitual abortion of dietary origin is the result of research extending from 1920 until the present day. The treatment, according to published reports, has been successful in about 70 per cent. of cases. The classical experiments were all carried out using *whole* wheat germ oil.

Whole wheat germ oil has been available since 1934 as Fertilol, which is a highly active *natural and stable* source of vitamin E, plus the other naturally occurring factors of wheat germ oil.

ESTABLISHING LACTATION

Where there has been previous difficulty in establishing lactation Bemax taken throughout the later months of pregnancy will be found of great assistance. Containing, as it does, all the factors of the B complex, together with a high content of available iron, Bemax is widely used in Maternity Hospitals for its effect on lactation. One ounce provides—

Vitamin A ..	280 i.u.	P.P. factor ..	1.1 mg.
Vitamin B_1 ..	400 i.u.	Vitamin B_6	richest source
Vitamin B_2 ..	0.9 mg.	Vitamin E	Approx. 8 mg.
Iron	3 mg.	Phosphorus ..	330 mg.
Copper ..	0.45 mg.	Magnesium ..	99 mg.

NEW ASPECTS OF THE USE OF VITAMIN B

The present interest in the importance of diets rich in vitamins is mainly directed to their value in promoting a high level of general health and the capacity for increased output of work without undue fatigue. The use of high vitamin therapy in the relief of pain is a newer concept. Yet such forms of severe pain as that of certain types of neuritis, trigeminal neuritis and varicose ulceration can often be relieved and controlled by this means.

A preliminary course of injections of pure vitamin B_1 (Befortiss Ampoules, 2, 10 and 25 mg.) for high vitamin B_1 dosage should be followed by routine enrichment of the diet with Bemax. Apart from the improvement in general health, there is often a diminution of the symptoms.

Vitamin B_1 with other factors of the B Complex

Clinical experiments with vitamin B_6 (*J.A.M.A.* 115.3.209) show its effects in toxic peripheral neuritis, and on the haemopoietic system (*Nature*, 1940, 145, 388). Its effect on the skin is well known. Vitamin B_6 and other factors of the B complex are present with vitamin B_1 in Befortiss Tablets. Befortiss Tablets are available in two strengths—200 i.u. per gramme and 2 mg. (666 i.u. per gramme).

Descriptive literature and clinical samples of Pregnavite, Bemax, Fertilol, or Befortiss Tablets and Ampoules sent on request. Please state product(s) in which you are interested.

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PREGNAVITE :	A vitamin and mineral supplement for use during pregnancy.

diarrhoea, and the like. From May to October no bedclothes could be worn. Even the fine net to protect from sand flies and mosquitoes was at times oppressive. The temperature in midsummer ranged from 98° F. to 103° F. in the day-time, and usually about 85° F. at night. There could hardly be any chill at such temperatures. By July there is usually a breeze known to the Egyptian as the Nile wind but mostly the nights are only too still.—I am, etc.,

JAMES W. BARRETT, Lt.-Col., A.A.M.C.

Melbourne, March 25.

Treatment of Rectal Carcinoma

SIR,—I regret the unavoidable delay in answering Mr. W. B Gabriel's letter (March 29, p. 492).

My cases were judged inoperable on the usual ground of firm adhesion, the decision being made in the first instance by one or other of my surgical colleagues. The estimation of operability is, of course, a personal matter, and I have no doubt that in a special hospital the criterion may be different from that which obtains in a general hospital. While admitting that the more general performance of laparotomy may be desirable to settle the question, I cannot agree that, if this shows a case to be inoperable, colostomy should be carried out as a matter of course. The whole point of my article was, in fact, to show the opposite, and I hope that Mr. Gabriel and others will give my suggestion an extended trial. I agree, however, that if the anal canal is involved colostomy is desirable.

In none of the four cases which I described was biopsy performed. Recent examination of them showed that each had a firm adherent mass. In one of them the proctoscope revealed slight superficial haemorrhage, but in none was there any ulceration.—I am, etc.,

Cambridge, June 2. FF. ROBERTS.

Treatment of Diphtheria

SIR,—In my opinion, the use of sulphapyridine and other sulphonamides in the treatment of diphtheria should be discouraged until there is evidence that sulphonamides can deal effectively with organisms localized in the throat. Scarlet fever may be regarded as being similar to diphtheria in that the causal organisms growing in the throat produce most of the symptoms by toxins which are absorbed by the lymphatics. In a series of some 500 consecutive cases of scarlet fever I treated alternate patients with sulphanilamide. In the two groups thus obtained there was no appreciable difference regarding either the severity and length of the initial feverish illness or the incidence of complications. This is in agreement with the findings of other physicians. Sulphonamide therapy, though useful in other infections with haemolytic streptococci, thus appears to be useless in combating haemolytic streptococcal infections of the fauces, such as scarlet fever. In the treatment of diphtheria, therefore, the following considerations should be kept in mind: (1) The disease is produced by toxic absorption from a localized infection. (2) Sulphonamide drugs act on bacteria not on toxins. (3) Sulphonamides are effective only when the pathogenic organisms are in, or can be easily reached by, the blood or tissue fluids. Thus lung abscess and empyema following pneumonia, or abscess due to erysipelas, do not respond to sulphonamides though the initial infection is amenable to this treatment. (4) Bacteria growing in the throat may be regarded as being inaccessible to sulphonamides in the blood or tissue fluids.

My experience with vitamin B_1 in the treatment of diphtheria tends to support the evidence produced by Drs. G. E. Donovan and M. Bannister (March 8, p. 359). Of four severe cases recently all were given vitamin B_1 parenterally from the time of admission, and all developed severe nervous or circulatory complications about the third week. One patient died in the fifth week after progressive palatal and pharyngeal paralysis and acute circulatory failure; one recovered (only after three weeks) from severe palatal paresis with circulatory failure (gallop rhythm); one recovered after palatal paresis and threatened cardiac failure (bradycardia); one recovered from severe palatal paresis. My opinion is that vitamin B is a useful tonic in debilitated states, but it is not a specific for the nervous or circulatory complications of diphtheria, either as a curative or as a prophylactic measure.—I am, etc.,

Thornton, Fife, May 26. JAMES B. FLEMING.

After-treatment of Paraplegic Patients

SIR,—Lieut.-Colonel E. A. Gowlland's article (May 31, p. 814) on the after-care of paraplegic patients, carrying as it does the weight of extensive experience, is most opportune as it outlines clearly the essential points in the treatment of late cases. A reference to early treatment, however, is open to argument. One of his two conclusions was the necessity for the freeing of pressure on the spinal cord by laminectomy. In practice laminectomy is very seldom indicated and cannot compare in importance with the correction of bony deformity by manipulation. A depressed fracture of the laminae, the most obvious indication for the operation, is relatively uncommon, and not infrequently causes irreparable damage to the cord. Again, metallic bodies in the spinal canal are generally best left alone.—I am, etc.,

Stanmore, June 5. K. I. NISSEN, F.R.C.S.

Epidemic Dropsy and Toxic Oils

SIR,—May I draw your attention to a reference made by you in your issue of November 16, 1940 (p. 681), to the recent work on the causation of epidemic dropsy carried out at the All-India Institute of Hygiene and Public Health, Calcutta. The concluding sentence suggests that the disease is caused by the use of raw untreated oil in food and in the oil bath. This, read in conjunction with the sentences preceding it, would suggest that the use of the oil as culinary fat is free from danger. On the other hand, our studies[1] support the view that the practice of anointing the body with the toxic oil is probably harmless, whereas the heating of the oil as it occurs in the process of cooking meat, fish, or vegetables, which does involve fuming, causes the disease. However, as judged by chemical tests, the oil becomes detoxicated on exposure to sunlight (not necessarily ultra-violet light), especially in the presence of air.[2] Further work, shortly to be reported, shows that animal and human feeding tests confirm the above findings.—I am, etc.,

R. B. LAL, M.B., B.S., D.P.H., D.T.M.&H.,
Professor of Epidemiology and Vital Statistics, and Officer in Charge, Epidemic Dropsy Inquiry.

Calcutta, Feb. 26

Silk in the Darning of Hernias

SIR,—The correspondence on this subject in the *Journal* revives old memories on the part of a general practitioner who some forty-five years ago was a dresser to the late Frank T. Paul of revered memory. Over and over again did that great surgeon impress upon the students of the Liverpool Royal Infirmary never to bury silk, on account of its permanence, its readiness to become a nidus for germs, and its powers as a tissue irritant—all these illustrated out of the wealth of his experience. Myself having one day mentioned this matter to Thelwall Thomas then assistant surgeon at the Royal, he said that if one used fine silk and sterilized it well one had nothing to fear. It was only a short while afterwards that he showed me a persistent sinus following the use of silk in a femoral herniotomy, and told me that he had abandoned the use of buried silk.

In the long years that have passed since then I have met with abundant proof of the soundness of Paul's teaching, and would not willingly submit a patient of mine to the risks of buried silk.—I am, etc.,

Harston, Cambridge, June 7. W. J. YOUNG.

Physical Medicine and Orthopaedics

SIR,—The letters from orthopaedic surgeons (May 24, p. 791) call for vigorous protest. Physical medicine does not give poor results when properly applied in suitable cases (was not the life of King George V prolonged by ultra-violet rays and diathermy?); neither need inertia be caused; and the suggestion that physical medicine can only survive as a part of orthopaedic treatment is ludicrous.

What is physical medicine? An enormously wide part of therapeutics. It includes treatment by physical agents such as electricity (alternating, direct, high-frequency, and static), water (plain or medicated), massage, exercise, manipulation,

[1] Lal, R. B., *et al.*, *Indian J. med. Res.*, 1937, 25, 201; 1939, 27, 209.
[2] Idem, *ibid.*, 1940, 28, 173.

etc.; rays (radium, χ rays, ultra-violet, infra-red), climate, diet, and so on. What is orthopaedic surgery? Mr. Harry Platt answers by quoting Sir Robert Jones: "The treatment by manipulation, operation, re-education, and rehabilitation, of the injuries and diseases of the locomotor system." Thus it is evident that orthopaedics is a branch of physical medicine, as are radiology, electrotherapy, hydrotherapy, and the rest.

Orthopaedic surgeons cannot be expected to have adequate knowledge of all the various means employed in physical medicine. Other physical methods than orthopaedic are used successfully in such diseases as lupus, rickets, sinusitis, otitis, pneumonia, to mention only five which the strict orthopaedic surgeon would not treat. As regards the title "orthopaedic physician," this limits activity to the orthopaedic section alone. There can be no really comprehensive title for the practitioner in physical medicine, as the subject has become so all-embracing.—I am, etc.,

ARTHUR T. SPOOR,
Lecturer in Physiotherapeutics, Bristol University.

May 25.

SIR,—I read with great interest Mr. Harry Platt's letter (May 24, p. 791). There can be few who would disagree with the principle of unity of control in treatment throughout the course of an illness.

He specifies the rheumatic diseases as the responsibility of the physician and deplores the subletting of therapeutic procedure. With this I heartily agree. In this group of diseases the knowledge and practical experience of a general physician are essential in many cases to obtain a correct diagnosis and consequently sound treatment. But for the successful unity of control in treatment the physician must have a full knowledge of physical therapy, plaster technique, and manipulative procedure, only being dependent on a surgical colleague for operation details. In fact, he should be a general physician.

Prof. Davidson stated some four years ago that improvement in the treatment of rheumatic diseases would lie in the progress of medical orthopaedics, and so I would disagree with Mr. Platt in his remark that the "orthopaedic physician" of the future—a term which I hope will never come into use—should be drawn from the ranks of the fully trained surgeons. The conditions with which these men deal will be chiefly medical conditions, and they must be primarily fully trained physicians, and, secondly, have a knowledge of medical orthopaedics.—I am, etc.,

OSWALD SAVAGE.

London, W.1, May 27.

SIR,—I have read your annotation and the correspondence on this subject with much interest. There are a number of important and useful points in all of them, and I think that the majority of physiotherapists would strongly support any scheme for the expansion of the physical medicine services provided for the Armed Forces. There is a very real demand for adequate and appropriate service for the Forces both at home and abroad on account of the economic value of prevention of loss of function and of rapid restoration of function, which are the aims of physical medicine.

The consultant in physical medicine to the Army and his staff are doing most valuable work, but expansion of the present service is required, since a great burden is being put on to the civilian hospitals with E.M.S. facilities by Service patients who require treatment in their departments of physical medicine, and very often these patients come great distances to have their treatment in these departments. From the military and other Service hospitals over-seas one continually hears of the demand for adequate departments of physical medicine, and, therefore, it is hoped that an adequate expansion of the present service will come into being to cope with these requirements.

Sir Morton Smart, in his letter (May 24, p. 792), puts forward an extremely sound constructive scheme for a committee of physiotherapists, with power to act, to be set up to advise and to develop any such plan, and I think that this suggestion would meet with the strong support of all physiotherapists. The shortage of adequately qualified specialists in physical medicine affords some difficulty in providing them for both the civilian and the military services. For this purpose, therefore, it is well worth while considering the appointment of physiotherapists, as in the last war, in each large centre, who would be in the R.A.M.C. and who could look after departments in both the military and civilian hospitals in that area. It is also important to have an adequate supply of qualified masseuses for the Service departments and not merely orderlies with a brief training.

I also support the letter from the British Orthopaedic Association. I consider that the physical medicine specialist should be not a technician but a good clinician with higher academic qualifications and large general experience of all branches of medicine and surgery, who has also knowledge of the types and methods of physical treatment, applied psychology, and social welfare. There are also good "orthopaedic physicians" to-day who can compare in diagnostic efficiency with their surgical colleagues.

The function of the physical medicine specialist is to work in the closest collaboration with his brother practitioners and to help them in the realm of preventive medicine, diagnosis, and treatment, bearing before him the aims mentioned above —of prevention of loss of function and restoration of function. This collaboration can always be close and of mutual benefit. There is no need for difference of opinion from the orthopaedic surgeons, with whom, in Oxford at any rate, there is always the closest co-operation.

In the cases in which psychological and medical factors play a part the physical medicine specialist can offer invaluable help to the orthopaedic surgeon. The complete unit required for restoration of function under the specialist in physical medicine, and in which he would play an important part in controlling the personnel, would consist of three parts: (1) a department of physical education and treatment; (2) a department of occupational therapy; (3) a department of rehabilitation in which vocational suitability, guidance, and training should be established. Patients suffering from organic or psychological disorder, or both, could be treated in one or more of these departments, which would work together.

While the various types of physical treatment such as manipulation, massage, electricity, and hydrotherapy have a definite important adjuvant part to play, the main principle in departments of physical medicine should be "active movements of mind and body of the right type at the right moment."—I am, etc.,

BASIL KIERNANDER, M.B., B.S., M.R.C.P., D.M.R.E.
Radcliffe Infirmary, Oxford, May 30.

"Bureaucratic Surgery"

SIR,—Mr. Norman Lake's excellent letter on bureaucratic surgery and the subsequent correspondence in the *Journal* have raised issues that have been exercising the minds of many for a considerable time. The arguments offered in defence of the special units and the claim for the monopoly by a few in wide fields of surgery, even to the inclusion of burns, scalp wounds, etc., have not as yet been wholly convincing. For instance, one of the main contentions appears to be that some cases reaching the special centres have been badly treated, and therefore all such cases, however trivial, should be sent in the first place to these special centres. Is it not possible that many cases treated successfully by the unknown surgeons are never seen at the special units to offset the failures that arrive there, and that good work can be done in many of the lowly shrines as well as in the temples of the high priests? Does the title "specialist," whether having been justly earned or merely acquired, assure a 100% success in contrast to the poor results of others? Are there no failures in the special units themselves, even at the hands of the high and mighty? I wonder if their work would be so infallible if they had to work under the conditions that many have to face in the hospitals that provide the necessary medical treatment. Perhaps even in their hands the razor would sometimes falter before the scalp was bared to perfection.

However, the recent correspondence has opened up much wider issues than suggested by the title under which it has appeared. These are really concerned with the whole system of the country's medical services in wartime, and I hope it will be understood that the following remarks are directed at the principles of that system and not at any particular individuals. Admittedly, much advancement in knowledge might be derived by the concentration of material for the exclusive use of experts in clinical research, but which of the three groups involved will benefit most from this advancement the personnel of the clinic, the body of the medical profession, or the experimental animal, the general public? Is there not a danger that centres created ostensibly for the greater perfection of treatment and the ultimate benefit of

the public might soon merely provide an opportunity, not necessarily deliberately calculated, for the advancement of the practitioners who derive from them the exclusive rights of experience and advertisement? At least one famous American clinic appears to have been tainted with suspicion in this way.

There are many who think that reorganization of the Emergency Medical Service is long overdue. The trend of medical organization in modern warfare has been to distribute the medical services so that the patient might be treated skilfully as soon as possible after the infliction of the injury, and not be merely temporarily patched up and relayed for proper treatment to base units which it might take a considerable time to reach. However, in many of the E.M.S. hospitals of this country, existing solely for the early treatment of the injured, students, newly qualified housemen, and even fully fledged surgeons walk the deserted wards and corridors without any work from which to learn that necessary skill.

Could not the work be more evenly distributed among the hospitals of the country, with regular inspection by qualified people to see that it was done adequately? Then the whole medical personnel might have the opportunity to obtain the experience that is necessary for the successful early treatment of the sick and injured, instead of this being reserved for the few who are fortunate enough to be appointed, either by influence or good luck, to the few special centres. By this means a far greater proportion of students could be adequately trained for the fighting Services than at present, and all would be given an equal chance. Also, a more accurate assessment of the available medical and surgical talent in the country could be formed, and a better use made of it, to the greater benefit of the public, which means the greater welfare of the State, which should be our only aim in total war.

The travelling consultant would need to be truly skilled and competent in his specialty, and be appointed for that and no other reason. He must also be unbiased, without any special interests in the products of one medical school or another, or in any particular group of people. Perhaps it might be suggested that there would be a shortage of suitable specialists for this work, but if search were made occasionally beyond the confines of the teaching hospitals it might not prove so difficult.

The true goal of medical progress should surely be the provision for the public of as widespread, in addition to as competent, a service as possible, rather than skilled treatment ("skilled" being sometimes, alas! merely a *courtesy* description) at the hands of a privileged few, with the consequent higher cost to the patient that goes with monopoly. There are many surgeons in the E.M.S. who have been waiting since war was declared to try to save the lives of the sick and injured and play their part in the war effort. Such, however, has been the growth of special departments, and the creation of centres in which those with influence or authority are primarily interested, that the bulk of the cases have been taken by them, and the waiting surgeons are still waiting with no lives to save.

Can it be that those who have found themselves in commanding positions during the war are using their temporary powers to ensure for the groups in which they are interested a first claim to appointments afterwards in case State Medicine becomes a reality, and are excluding others from competition by denying them access to experience now, and thus reducing indirectly the value of the total war *effort* of the professional?—I am, etc.,

London, E.2, June 2. G. R. BUTTERFIELD.

Medical Planning Commission

SIR,—Close examination of the report of the first meeting of the Medical Planning Commission (May 17, p. 759) reveals no obvious evidence of appreciation by the Commission of the necessity to co-ordinate short-view medical planning with the various aspects of planning in other spheres such as agriculture and urban reconstruction. For instance, it seems to me most unlikely that the Army—now an efficient technical machine—will be disintegrated, on cessation of hostilities, into labour exchange queues. It may be retained, complete with medical personnel, and diverted more or less *en masse* to immediate agricultural, etc., requirements. Thus, medical planning out of step with such plans as may be in the minds of the Army authorities may have to be modified out of all recognition when national post-war plans are constructed.

I would therefore like to suggest to the Medical Planning Commission that a special political subcommittee be chosen for the express purpose of maintaining political contacts with the Ministries. This will enable the Commission to implement its findings, when the time comes, instead of scrapping them, as so many commissions have had to do.—I am, etc.,

Kearsley, Lancs., May 31. D. OCKHAM.

SIR,—In the report of proceedings of the Medical Planning Commission meeting (*Journal*, May 17, p. 759) it is stated that they hope to have a preliminary report to submit at the end of this or early next year. At this rate when are we to expect hearing of any definite proposed plan of action? Already the Minister of Health is proposing to include another half-million private patients in the N.H.I. scheme. Does this not call for more immediate action? It is to be regretted that Dr. Stark Murray's proposition was not adopted to consider domiciliary services and preventive medicine as a whole rather than to have committees investigating the separate branches. One of our present troubles is the lack of co-ordination between the various services.

Would it not have been a wise step to find out the attitude of the profession as a whole towards the future of our medical services? This could easily be done by some body such as the B.M.A. sending out a very brief questionary to all registered practitioners on the following lines:

(1) Are you satisfied with the present medical system?.....
(2) If not, is it because
  (a) it fails to give the best treatment to the people as a whole? .....
  (b) it fails to give satisfactory conditions of service to the practitioners? .....
(3) Are you in favour of a State Medical Service? .....
(4) Are you in favour of extension of the N.H.I. as proposed by the Minister of Health? .....

A questionary on these lines would certainly give the M.P.C. some idea of the feelings of the profession.

One of the great arguments against a State Medical Service is that of free choice of doctor. It is used by the opponents because it might appeal to the masses, but it is a greatly overrated argument. *I quite agree with Dr. S. F. Marwood* (*Supplement*, May 17, p. 96) when he describes it as a bogy, and surely anyone reading that article must be convinced that the argument of free choice of doctor is a myth.—I am, etc.,

Wetherby, May 27. S. TERRY PYBUS, M.B.

Medical Man-power

SIR,—I have read with shocked amazement Dr. C. A. H. Franklyn's letter (May 3, p. 600) and with your permission I will roughly analyse and supplement it.

(1) 35,000 doctors are engaged in active practice in England and Wales.

(2) Of these, according to Dr. Franklyn's estimate, the Forces (3,000,000 healthy men) have been allotted a grand total of 10,000—(30%)

(3) This represents three doctors to every thousand of the nation's fittest men, whereas in times of peace one doctor to a thousand laymen is the standard ratio.

(4) Bitter experience taught us how useless was a doctor (at £2,000 and five years' training!) in front-line warfare twenty-five years back.

(5) None the less, to-day, with every one of us permanently in the "front line," nearly one-third of our trained surgeons and physicians are side-tracked into office work—or else appointed to the care of minor ailments. Serious cases are transferred to general hospitals for treatment by the remaining 25,000 qualified men in mufti. Here is short-sighted economy indeed; for while the "soldier doctor" renders first aid to 300 men at £450 p.a., his civilian colleague is responsible not for a peacetime average of 1,000 laymen but for nearly 1,700 "front-liners"—and in our crowded hospitals the senior "honoraries" still receive a nominal £50 a year.

Having regard to these facts, I shrink from setting out a responsibility/work/pay ratio in black and white. But one irrefutable example may be better than abstract mathematics.

A year ago the British Army in Dunkirk was conjured home, and the great bulk of the casualties came streaming into

a hospital whose peacetime home is London. Some men were so exhausted that an 80% oxygen, 20% gas mixture alone induced deep anaesthesia! Each theatre in the hospital worked at high pressure for a fortnight—twenty hours a day and three tables to each theatre. The two (honorary) anaesthetists who wrestled with this task wore—mufti. They do so still; and foot their tailors' bills. These facts can easily be verified.

May I suggest that further comment is superfluous, but that prompt and effective reorganization of our "medical man-power" is, in the interests of common decency, clearly imperative?—I am, etc.,

H. BUCKLAND.

Bournemouth, May 28.

SIR,—I should like to congratulate Dr. James Fettes on his letter (May 31, p. 834) concerning medical man-power. There is in fact a reserve of British medical man-power in London, and almost certainly in the other target areas, waiting to be used.

Dr. Sanguinetti hints at financial difficulties without going into details. There seems to be some shyness in mentioning that many of us who are hanging on by the most precarious of holds and at the risk of life and limb are doing so for the benefit of those who in better times were willing to lend us the money with which to buy house and practice. How can I go off and leave an investment worth nearly £5,000, hardly any of which was my own money? The company to which I remain chiefly indebted have treated me with sympathy and understanding, although I must admit that I was irked to be told at the outbreak of hostilities that my debt was largely a matter of "honour." No question of honour had been raised when the apparently ample security for the loan was originally under discussion.

Your advertisement columns tell me that I can earn about £650 if I betake myself as assistant to a reception area. Out of that I must continue to find mortgagé interest, ground rent, rates or storage, and other incidental outgoings in which one must include about £100 per annum in insurance policies which are bound up with the mortgage. With the remainder I must try to provide for a wife and three children of school age.

I wrote pointing out some of the difficulties of this sort of position to an M.P. who is most anxious that the shortage of doctors should be made up by giving employment to those aliens of enemy origin who are now in refuge in this country. I did not receive the courtesy of an acknowledgment.

One's feelings are akin to those said to have been experienced by a man who was holding a ferocious wolf by the ears.—I am, etc.,

DONALD M. O'CONNOR.

London, S.E., June 1.

Medical Certification

SIR,—In these times when we are troubled so much with requests for this and that kind of medical certificate, it would greatly help the doctor's position if some printed form were supplied to be displayed in the waiting room. The days of the "heavy father" kind of medical man who could bully the neighbourhood are gone for ever, and we are now regarded as more or less bound to "oblige" our patients in their every whim and fancy. I suggest that the B.M.A. should supply us with some such notice as this:

BRITISH MEDICAL ASSOCIATION

MEDICAL CERTIFICATION

The attention of the public is drawn to the following rules regarding certification, breach of which may render a doctor liable to serious penalties.

1. A doctor may not issue a certificate unless he has seen the recipient on the date stated on the certificate.

2. A doctor may not put anything on a certificate which is not the result of his own observation.

3. No certificate may be issued to excuse absenteeism from work if the applicant has not been receiving medical treatment for the illness or other condition causing the absence from work.

4. No certificate can be issued to render it easier for a person to change his employment unless the applicant has received treatment for the alleged condition for at least six months prior to the application.

—and other such rules as may fit the moment.—I am, etc.,

JOHN UNSWORTH.

Leach Lane, St. Helens, May 31.

Obituary

SIR D'ARCY POWER

Prof. G. GREY TURNER writes: If space permits I should like to add a few personal memories of the "G.O.M. of Bart's" to your admirable obituary notice.

Not so very long ago I was asking Sir D'Arcy Power about his association with one of the great figures in our profession. While agreeing in admiration for the surgical prowess and scientific ardour of the person in question, Sir D'Arcy went out of his way to state, and with some heat, that he had been a very bad examiner. To my surprised inquiry about the reason, I was told that he had always tried to find out what the candidate did not know. Like a flash, recollection carried me back forty-six years to the time when, as a callow youth, I had first confronted Sir D'Arcy as an examiner in physiology, and in retrospect I realized that at the outset of my career he had given me much-needed encouragement by endeavouring to discover what little I did know about that subject. Since that early meeting Sir D'Arcy proved guide, philosopher, and friend, and I cherish large numbers of communications that have passed between us—letters, notes, and short messages on post-cards, but always delightful. He loved to incorporate some little pleasantry, some quip or gibe, but they were always apt and never hurt. If he could do a good turn he was pleased from him arrived as recently as February, when, in spite of advancing years and increasing disabilities, he was going out of his way in an endeavour to help me. At the outset of my surgical career he made me swell with pride by quoting a case I had recorded in a trivial paper in our local medical journal. Thereafter he introduced me to his paper on "Introsusception" and aroused my interest in the great collection at the College of Surgeons by telling me about the microscopical examination of an age-old Hunterian specimen. Then came a kindly note of appreciation about an account I had published on Perceval Pott, mildly directing my attention to an error into which I had fallen. Since there are so many of us, it is refreshing to find that there are some few learned ones who suffer us with helpful compassion and perhaps even gladly.

November 14 last was a memorable day, for after sharing a wartime lunch arranged in his honour by the Council of the College, Sir D'Arcy attended our monthly meeting and handed to the President the material for the first supplement to *Plarr's Lives of the Fellows*. This comprised two volumes of type-script containing notices of the lives of the 400 Fellows who had died since the original publication ten years ago. In the first instance every one of these notices had been written by Sir D'Arcy's own hand, and their compilation had involved great labour in the way of research and inquiries. But, lame and breathless, he was not to be robbed of his little joke as he reminded the Council that in the next supplement, on which he was already engaged, his own necrology must appear. Devotion to hospital duty was always a byword strictly observed at Bart's, and this tradition must explain the little story, almost certainly true, about the occasion in 1882 when young D'Arcy Power was rather late for eight o'clock surgery one morning, apologizing and explaining that he had been a little delayed as he had been getting married on the way down to the hospital. The same urge to follow the traditions of the hospital impelled him to go down at night and often on a bicycle to do his own emergency operations, almost to the end of his service at the mature age of 65, because it was a duty specified in the "Charter."

No one did more to stimulate the study of the history of surgery, for he made the subject so real and interesting, and so alive. The reader of his papers was brought face to face with the actual persons, so that the mediaeval surgeons came to life almost as if in a dream. The long series of Eponyms which he contributed to the *British Journal of Surgery* gave great pleasure and there was wide regret when they came to an end. Notwithstanding his deep learning, he was a practical antiquarian, who during a saunter in the City could make the stones of the London he knew so well reveal their fascinating story. I was glad to see that you had mentioned his purely professional contributions to the literature, for many

surgeons will recall lessons pleasantly conveyed by his pen. I am always grateful for one communication on ruptured peptic ulcer (I cannot vouch for the title, but that was the subject), in which he made a plea for the minimum of interference and the greatest simplicity in operating—a valuable doctrine not yet sufficiently followed. In fact, it was Sir D'Arcy's advocacy of the sufficiency of these simple measures which suggested to my mind the application of the aphorism of Laotze to surgery. "The State is best governed as you cook little fish without much busyness." Though most of his papers were direct and simple, there were some with a deeper meaning, and I have always remembered his striking clinical lecture delivered at Bart's in 1915 on some aspects of venereal disease under the title "Against His Own Body." This lecture might serve a very useful purpose if it were reprinted to-day. But Sir D'Arcy had very many qualities which made him valuable to the medical community, as witnessed, for instance, by his long tenure of office as treasurer of the *British Journal of Surgery*. He was a great host, a notable diner, and an authority on wines, but, above all else in this sphere, a delightful and entertaining companion. The unusual interest evinced in the passing of one at the advanced age of 85 is in itself noteworthy testimony to the worth of his years. It might be said of Sir D'Arcy as Sir James Paget said of Stanley one of the Bart's surgeons of his own early days, ". . . . he was completely honest, true and truth-loving, keenly conscious of his duty and resolute in doing it." In addition, few men can have had better developed the gift for sustained, helpful, cheerful friendship.

H. ELWIN HARRIS, M.A., M.B., F.R.C.S.

Herbert Elwin Harris, formerly of Bristol, who died on May 20, was born in 1860 at Binham in Norfolk and was baptized in the beautiful old Norman abbey church there. His father, like many of his forbears, was a gentleman farmer who lived in a house facing the green; his mother, a Miss Wrench, came of another old Norfolk family.

He was educated at his uncle's school in Truro, whence he proceeded to Christ's College, Cambridge, and graduated in the Mathematical Tripos in 1882. He was destined for holy orders, but he persuaded his college tutor to allow him to read Medicine as well as Mathematics and he passed his first M.B. whilst preparing for the Tripos. After this his father consented to his continuing the medical curriculum and he went from Cambridge to St Bartholomew's, where he was a dresser under Sir William Savory. He took the qualifications of M.R.C.S. in 1885, L.R.C.P. in 1886, and M.B. Cambridge in 1886. After leaving Bart's he was a house-surgeon at Plymouth and then worked for several years in various London poor-law infirmaries, ending with a long period at St Saviour's, Dulwich. In 1890 he took the F.R.C.S. and settled in general practice in Bristol, where he was soon appointed anaesthetist at the Royal Hospital for Women and Children. A few years later he was elected to a vacancy as surgeon and became also surgeon in charge of the ear, nose, and throat department.

During the 1914-18 war Dr. Harris was captain R.A.M.C.(T.) on the *à la suite* staff of the Second Southern (Territorial) General Hospital and worked in the Beaufort War Hospital at Fishponds, Bristol. He was one of the last in Bristol to combine general practice with operative surgery, and he achieved success in both branches of practice. During his earlier years in practice Dr. Harris was almost hobbyless. His recreation was cycling, and in the fashion of the time he would ride vast distances in a day. Presently, however, he became an enthusiastic gardener and photographer. He was one of the first doctors in Bristol to drive a motor-car, and he was distinguished by favouring an open two-seater with a blue body and yellow wheels, which always looked new. However often he changed his old car for a new one he retained the original registration number.

Dr. Harris was President of the Bristol Medico-Chirurgical Society in 1933-4, and for forty-two years was a member of the British Medical Association. In 1934 he retired from practice to live for the rest of his life at Halse, near Taunton. There he died suddenly of coronary thrombosis, in the garden he so dearly loved, within a few weeks of his eighty-first birthday. Dr. Harris was widely known and well loved, especially by his patients, in whose interests he worked himself sparingly. He yielded to no one in his admiration for his old teacher, Sir James Paget, a Norfolk man like himself, from whom perhaps he had caught something of the kindly courtesy which was one of his outstanding characteristics. He was succeeded in his practice by his son, who had helped him for some ten years before his death.

SIDNEY DAVIES, M.A., M.D., D.P.H.

Dr Sidney Davies, for twenty-eight years medical officer of health for Woolwich, died at his home in Worthing on May 18.

Born in 1855 at Darwen, he was educated at Manchester Grammar School, Oxford University, St. Bartholomew's, and Paris. He graduated B.A. in 1877, gaining first-class honours in mathematics. He won the junior entrance scholarship at Bart's in 1878. He qualified M.R.C.S. in 1881 and M.B. in 1883 and took his M.D. in 1889. After holding a resident appointment at the Prince of Wales's Hospital, he went to Egypt, where he became principal medical officer to the Egyptian Police. In 1888 Dr. Davies settled in general practice and in 1891 he was appointed M.O.H. for Plumstead. In 1901, when Woolwich became a borough, he became its first M.O.H. and retired in 1919. During his period of service in Woolwich he introduced the first garden shelters for the treatment of tuberculosis, and was the first M.O.H. to employ women as sanitary inspectors. He was also the first M.O.H. to have notices put up in the public conveniences about venereal disease. He began the first maternity and child welfare clinic in Woolwich, which now has one of the finest organizations in this department in the country.

S. R. E. D.

An old friend writes:

One of our veterans of the Public Health Services has now "joined the majority," and it falls to me, also an octogenarian, to write a few words of appreciation. I fear that many others, like myself, failed to realize how well informed Sidney Davies was and the admirable work in public health that he accomplished. He was not an advertiser of what he had done, and it may be said of him that he suffered from the rare complaint of modesty, perhaps to an excessive extent. But nevertheless his work was done and well done, without any fuss being made; and when the books come to be made up, his work in the ordinary sanitation of Woolwich, and in the special new developments of tuberculosis, of maternity and child welfare work, of the treatment and prevention of venereal disease—all newly developed in Woolwich under his leadership—will make it clear that he left Woolwich a different and immensely better area than he had found it. In postscript to his biography, one specially original piece of work, carried out jointly with Dr. J. C. Thomas of the L.C.C., is outstanding. Thus was on the experience of measles in the school population of Woolwich—a valuable early study of the epidemiology of that disease. Most of the original and specially important work of medical officers of health is interred in their annual reports, and it may be regarded as a major defect of our publicity work in public health that a special and often difficult process of disinterment is required for giving it the continued life that it deserves. That was especially so for Sidney Davies. But the good influence of such reports continues and increases with time, until what was individual becomes in time the possession of all.

W. F. BROOK, F.R.C.S.

Consulting Surgeon, Swansea General Hospital

Mr. William Frederick Brook, the well-known Glamorganshire surgeon, died on May 26 at Pennard, near Swansea, after a painful illness.

He was born at Wye, Kent, in 1861, and from King Edward VI School, Berkhamsted, entered St. Thomas's Hospital, taking the L.S.A. in 1886, the M.R.C.S. in 1887, and the F.R.C.S. in 1889. For two years he held house appointments at St. Thomas's, at the Hospital for Sick Children, Great Ormond Street, and the West London Hospital. After settling in practice in South Wales he was elected surgeon to the Glamorgan County Infirmary in 1912, and not long afterwards surgeon to the Swansea General Hospital and to the Port Talbot General Hospital. During the last war he served with the rank of major R.A.M.C. (T.) on the surgical staff of the 3rd Western General Hospital, Cardiff.

Mr. Brook joined the British Medical Association in 1892; he was honorary local secretary for the Annual Meeting in

Swansea in 1903, and served on the Central Council in London for two periods. At the Annual Meeting at Oxford in 1904 he held office as vice-president of the Section of Surgery. He was a Fellow of the Association of Surgeons, of the Royal Society of Medicine, and of the Medical Society of London. His main appointment outside medical life was that of J.P. for Glamorgan. Between 1896 and 1908 he contributed six papers on surgical and radiological subjects to the *British Medical Journal*.

HARRY EDWARD MANSELL, B.M., F.R.C.P.

A career of high promise has been cut short by the death on June 1, at Lambeth Hospital, of Dr. Harry Edward Mansell, consulting cardiologist to the London County Council Hospital Service. He was the son of the late Dr. H. R. Mansell of Hastings. He had a brilliant student record at Oxford and St. George's Hospital before he took the M.R.C.S., L.R.C.P. in 1927, the B.M.Oxford in 1929, and the M.R.C.P. in 1930.

After filling rather more than the usual number of resident appointments, Mansell seemed fairly started on the road to an assistant physicianship at his own hospital and a West End consulting practice, when he was impressed with the opportunities afforded by the reorganization of the municipal hospital services of London proceeding, due to the Local Government Act of 1929, under the aegis of Dame Barrie Lambert and Sir Frederick Menzies. He accordingly sent in an application for a vacant medical superintendency: although he did not secure it, the committee before whom he appeared at County Hall were so impressed with his value as a recruit to their staff that they spontaneously offered him the appointment of deputy superintendent at the largest and in some ways the best equipped of their hospitals, at Lambeth. This he accepted, and after rendering good service there, during which he was laid low with diphtheria, Sir Frederick Menzies recommended him for appointment as cardiologist to the entire L.C.C. hospital organization; this was a post entirely after his own heart, for he disliked the divorce from clinical medicine at the bedside which so many of the higher posts in the L.C.C. on the administrative side necessarily entail to a greater or less extent. Mansell was a man of modest and attractive personality, who wore his learning lightly. He became a Fellow of the Royal College of Physicians in 1937; but his health was never robust, and his death at the early age of 40 is a serious loss to London. He leaves a widow and two young children.

R. H. P. ORDE, O.B.E.

Mr. R. H. P. Orde, who was well known to the medical profession as, until recently, honorary secretary of the British Hospitals Association and director of the Central Bureau of Hospital Information, died on May 24 in his seventy-fourth year.

His association with hospital administration began in 1898, and his first post was that of assistant secretary of the London Hospital. From there he went to Newcastle-upon-Tyne to become house governor at the Royal Victoria Infirmary. In 1922 he returned to London to take up an appointment in the medical department of the Joint Council of the Red Cross and St. John, which department was later reorganized under his direction as the Central Bureau. Under these auspices he was responsible as editor for that extraordinarily useful and encyclopaedic compilation, *The Hospitals Year Book*. Long before his honorary secretaryship of the British Hospitals Association began in 1929 his name was well known in the hospital world, and from that time forward he served on many Government and other commissions, including two recent interdepartmental committees, one on the nursing services and the other on the cost of hospitals. In all these matters his counsel and experience were of the greatest value. No man was better acquainted with British hospitals in all their great variety of administration or did more to bring hundreds of independent units into something like a common policy. He was the very man to serve as honorary secretary of the Voluntary Hospitals Commission, better known as the Sankey Commission, and one can only regret that a few more years were not given him in order to assist the present movement towards hospital regionalization which gained its first impetus from that Commission. Mr. Orde was a quiet man who knew his job, and in hospital circles he will be greatly missed.

The death took place on April 28 of Dr. ALEXANDER GLENCORSE HAYS of Woodford Halse, near Rugby. Dr. Hays took the Scottish triple qualification in 1896, and, after holding appointments for a short time at Glasgow and at Sheffield, settled down in practice in Northamptonshire, at first at Eydon and later at Woodford and Hinton. He was also surgeon to the London and North-Eastern Railway and medical referee to various assurance companies. During the last war he was medical officer to the Lady Fermor Hesketh Auxiliary Hospital at Eydon Hall, where hundreds of soldier patients passed through his hands. At one time he was a member of the Daventry board of guardians and of the rural district council. Outside his practice his interests lay in music, horticulture and Freemasonry (he had been a member of his lodge for nearly sixty years). He was the founder and conductor of a local choral society and an orchestral society, an energetic promoter of the Boy Scout movement, and an organizer of first-aid and ambulance teaching and work, especially in connexion with the L.N.E. and L.M.S. Railways. During the last two or three years he was compelled by the after-effects of a road accident to relinquish a large part of his practice, and it gave him much happiness to know that his colleague Dr. A. E. Clayton was in charge.

The death in London, in April, of Dr. WILLIAM GARFIELD FORDE, through enemy action, will be regretted by many friends and patients in Australia, India, and England. "Bill" Forde (writes a correspondent) came from a well-known family in Cloyne, Co. Cork, and after medical studies and qualification in Edinburgh and at Trinity College, Dublin, he settled down to practice in Australia after a short period of employment in the Argentine. On the outbreak of war in 1914 he at once joined the Australian Expeditionary Forces, was present at the attack upon and occupation of New Guinea, and later proceeded to Egypt with the "Anzac" troops. After the war, and after holding a temporary appointment in Assam, he practised in Bombay for many years, and was known to a wide circle of patients (European and Indian) as a sound and hardworking practitioner. Possessed of a keen sense of humour, a distaste for humbug, a refusal to suffer fools gladly, and an Irish temper—"quick up and quick down"—he gave bold expression to his opinions on professional, political, social, and religious subjects without respect to the rank, wealth, or influence of his company. A keen student of medicine, a loyal member of the British Medical Association, he did not go out of his way to make friends or to seek popularity, but he acquired both in good measure. May he rest in peace.

Dr. CECIL FRANK MOORE died at Hatton on May 18. He was born at King's Newnham, near Rugby, the son of Judge Moore, and was educated at Sherborne School and at St. Bartholomew's Hospital. He had a regular place in the hospital first XI as a fast bowler, and played also in the second XV. He also played cricket during vacations for Warwickshire Club and Ground. In 1928 he qualified, taking honours in the London M.B., B.S. In this same year he won the Brackenbury scholarship and the Willet medal. Though strongly attracted to surgery, and obviously a young man of great promise (he had passed also the Primary F.R.C.S.), he took no higher qualifications but settled down almost at once in general practice at Slough. Here he was highly successful and worked exceedingly hard, probably too hard: he became public vaccinator and district medical officer, was divisional surgeon to the G.W.R. St. John Ambulance Brigade, and was medical examiner to various insurance companies. He was also a member of the Bucks National Health Insurance Committee. Some little time ago his health broke down, and though there were periods of temporary improvement—as recently as February and March of this year he was able to do a little light professional work—his friends realized that these were merely flashes in the pan and that no real recovery could be expected. He leaves a widow and one daughter.

The following well-known medical men have recently died abroad: Dr. PHILIP BEINART, a radiologist of Port Elizabeth, aged 36; Dr. PAUL GARNEAU, major in the Canadian Army and professor at Laval University, aged 45; Dr. GEDEON DESROSIERS of Quebec, probably the oldest practitioner in the province, aged 93; Dr. HENRY E. MENAGE, a prominent dermatologist of New Orleans, aged 66; and H. M. HOU-JENSEN, professor of anatomy at Copenhagen.

The Services

NAVAL AWARD

The D.S.O. has been awarded to Surgeon Lieut. Allan Gordon Campbell, R.N.V.R., for gallantry and distinguished services in the withdrawal from the beaches of Greece under fire and in the face of many and great difficulties of many thousands of troops of the Allied Armies.

R.N.V.R. OFFICERS' DECORATION

The King has approved the award of the Royal Naval Volunteer Reserve Officers' Decoration to Surgeon Commander C. C. Elliott, D.S.C., R.N.V.R.

HONORARY PHYSICIAN TO THE KING

Colonel C. A. Wood, M.C., I.M.S., has been appointed an Honorary Physician to the King in place of Major-General H. C. Buckley, I.M.S., who has retired

ROYAL AIR FORCE DIETARY

The Air Ministry has appointed a biochemist, Dr Thomas F. Macrae, and a specialist medical officer, Squadron Leader W. P. Stamm, to watch over the food supplied to the Royal Air Force, so as to ensure that the greatest nutritional value is obtained. The biochemist will analyse the foods, and carry out experiments to discover the existence and extent of any deficiency in vitamins, minerals, salts, proteins, carbohydrates, or fats. The specialist medical officer will watch for the earliest signs of food deficiency in the health of the men. Both will study the preparation and cooking of food at the various units, the planning of a balanced ration from the available supplies and the prevention of waste. Catering and messing officers were appointed some time ago throughout the R.A.F. to improve the dietary. With the addition of two experts on nutrition it is hoped to prevent any sickness from lack of essential foods, such as occurred at the end of the last war.

CASUALTIES IN THE MEDICAL SERVICES

Royal Navy

Surgeon Lieut. CHRISTOPHER HENRY CONGREVE DENT, R.N.V.R., who is reported as "Missing, Believed Killed" in H.M.S. *Hood*, was 27 years of age and was the younger son of Mr. Howard H. C. Dent, F.R.C.S., and Mrs. Dent of Pattingham, near Wolverhampton. From Marlborough he went up to Christ's College, Cambridge, where he won a scholarship and prize and gained first-class honours in Part I of the Natural Sciences Tripos in 1934 and was placed in the second class of Part II in 1935. He passed the third year at Cambridge acted as supervisor in anatomy for his college. At St Mary's Hospital he won the Harmsworth Scholarship, and distinguished himself in clinical studies. After qualifying, M.R.C.S., L.R.C.P. in 1938 he took the degrees of M.A., M.B., B.Chir. at Cambridge. He had held the posts of house-physician at Addenbrooke's Hospital, Cambridge, and house-surgeon at St. Mary's, and junior demonstrator in anatomy at Cambridge. He joined the R.N.V.R. in 1938 and was posted to H.M.S. *Hood* at the beginning of the war. Surgeon Lieut. Christopher Dent had been a member of the British Medical Association since qualification. A personal tribute to his character and his brilliant attainments appeared in the *Times* of June 7.

Wounded or Injured

Temporary Surgeon Lieut. Leonard Desmond de Launay, R.N.V.R.

Probationary Temporary Surgeon Lieut. George Heaton Daglish, R.N.V.R.

Royal Army Medical Corps

Major DAVID WARDROP lost his life last month by enemy air action. He was the son of Dr. David Wardrop, of Rugby, and was educated at the University of Birmingham and St Mary's Hospital, qualifying M.R.C.S., L.R.C.P. in 1928. He also obtained the F.R.C.S.Ed. in 1931. After qualification he lived at Rugby and had held the posts of surgical registrar, house-physician, and house-surgeon at the Birmingham General Hospital. In 1933 he moved to Wellingborough, where he stayed until 1936, finally settling in Seaford. In 1939 he contributed an article on the treatment of uterine haemorrhage by radium to the *Queen's Medical Magazine*. He leaves a widow and three children. He had been a member of the British Medical Association since 1933.

Major JAMES EDWARD COLLETON ROUSE lost his life on active service in the Middle East last month. He received his medical education at St. George's Hospital, where he won the Brackenbury Prize in Surgery, and qualified M.R.C.S., L.R.C.P. in 1925. Two years later he took the M.B., B.S. of the University of London and in 1936 obtained the D.A. of the Royal Colleges. He had held the posts of house-surgeon, house-physician, and resident anaesthetist at St. George's before settling in practice at Worthing, where he was honorary anaesthetist to the local hospital as well as to Hove General Hospital. He was also honorary medical officer to the Royal Surrey County Hospital Convalescent Home at Worthing and an honorary anaesthetist to the Royal Sussex County Hospital, Brighton. He was a Fellow of the Royal Society of Medicine and a member of the Brighton and Sussex Medico-Chirurgical Society. He leaves a widow.

Missing

Lieut. Oliver Ive.

Medico-Legal

LEGAL RESPONSIBILITY OF THE SURGEON

In an address to the Medico-Legal Society on May 29 Mr. ZACHARY COPE pointed out how relatively modern was the surgical operation on any extensive scale. Sixty years ago a surgical operation was a rarity; about 300 were done in the whole year at St. Mary's; now it was almost the exception to find someone who had not undergone an operation. The ability of the surgeon to cure disease had become accepted by the public to such an extent that often no persuasion was needed to get people to consent to a necessary operation, but the added responsibility of the surgeon which was thereby entailed came under notice only when a legal claim arose, and then it came as a shock to find that legal opinion varied and that no specific rules existed for the guidance of judge and jury. The law did not pay any special attention to the surgeon *qua* surgeon. It was open to any qualified practitioner, however meagre his qualifications, to attend at any operation, however severe and complicated, and sometimes the mere tyro would undertake something over which the most experienced surgeon was hesitant.

Consent to Operation

To the conscious patient of mature age it was the duty of the surgeon to explain the nature of the operation and to obtain consent. His own practice was also to mention possible alternative lines of treatment and outline the probable course of the disease if operation was refused. If there was refusal and the matter was urgent, he asked the patient to put his refusal in writing. He never overpersuaded the patient to consent, nor did he suggest that the most trivial operation was without some risk. When only a limited consent had been given there was no justification for going beyond it save in cases where life was at stake. On the other hand, it was often more difficult for the surgeon to refuse operation when this was besought by the patient or his relatives. Surgeons did not like to be rushed into operation by non-professional entreaty, yet lay opinion might occasionally be right. In any case in which the patient or relative doubted the surgeon's diagnosis, common sense and prudence should lead the surgeon to seek consultation with a professional colleague of acknowledged rank. Refusal to call in a consultant might lead judge and jury to award damages against him.

Responsibility in the Theatre

The responsibility of the surgeon in the operating theatre had been the subject of frequent legal debate. It used to be the rule that the surgeon was responsible for the acts of all those who assisted him, and faults of anaesthetists and nurses were visited on his head. Successive decisions had cleared the position to some extent, but there still remained some uncertainty in this matter. If the nurse gave the

anaesthetic a special responsibility rested on the surgeon. There were so many skilled anaesthetists in the country now that it was difficult to see the necessity for the nurse-anaesthetist. Every surgeon, anaesthetist, and nurse must on occasion make a mistake, but provided reasonable care and skill were employed in the performance of the duty no action for negligence should lie. In nearly every hospital the care of swabs was regarded as the most vital duty of the theatre sister. Generally speaking, the surgeon trusted to responsible nurses to account for every swab, cloth, and instrument. Mistakes were more likely to happen when the surgeon and his assistants were not used to working together. The public seemed to expect greater perfection of cure in fractures than in any other condition, the reason probably being the greater ability to see what was happening. But complications might occur in cases in which every possible care had been taken. Finally, Mr. Cope appealed to lawyers who had to deal with surgical cases to take the opportunity of seeing surgical operations in progress and to learn something of the surgeon's responsibilities.

Medical Notes in Parliament

Medical Planning Commission

On June 10, Mr. ERNEST BROWN told Mr. Groves that he was aware that the British Medical Association had invited a considerable number of representative medical men and women to become members of a Medical Planning Commission whose terms of reference were: "To study wartime developments and their effects on the country's medical services both present and future" He was not aware (as was suggested in Mr. Groves's question) that the object of the Commission was "primarily to prepare evidence to be submitted to a Royal Commission." The members of this Commission were performing a useful public service in devoting part of their time to this work, and he hoped their deliberations would result in constructive suggestions which would make for an improvement in the country's medical services. He declined to arrange with the Central Medical War Committee that the services of these doctors should be more usefully employed in the interests of the State.

Survey of Social Insurance

On June 10, Mr. GREENWOOD informed Mr. R. Morgan that he had arranged with all the Departments concerned for a comprehensive survey of existing schemes of social insurance and allied services which would be considered in due course by the Committee on Reconstruction Problems of which he was chairman. Sir William Beveridge had accepted his invitation to become chairman of an interdepartmental committee which would conduct the survey, taking into account representations received from responsible organizations and persons concerned with the problems involved.

Army Eye-shields

Capt. MARGESSON, replying to Mr. Purbrick on June 10, said that at the request of the War Office the question of affording additional protection against eye injuries in the Army had been very carefully examined by an expert committee of the Medical Research Council in the light of evidence provided by this war and the last. Several tests of various kinds of protective devices had been carried out. As a result, the committee had now recommended that no special vizor in any material was required other than the present anti-gas eye-shield.

Returned Prisoners of War: Medical Examination.—On May 27 Mr. LAW informed Mr. Lewis that details were now being worked out of a scheme by which all returned prisoners of war would be medically examined, and appropriate medical treatment made available to those in need of it. Arrangements for the rehabilitation, under medical supervision, of disabled prisoners were being made by the Minister of Pensions and Minister of Health.

Fracture Treatment.—Mr. BROWN stated on May 29 that hospital authorities were informed by circulars of April 24 of the inclusion in the Emergency Hospital Scheme of fracture cases occurring among industrial workers and civil defence workers. Further details of the arrangements for treating these cases, whether occurring among the workers referred to or among other classes included in the emergency scheme, were contained in a circular to be issued in a few days. Copies would be sent to bodies known to be interested in this subject.

Retirement of Prison Doctors.—Mr. ROBERT MORGAN asked on May 29 whether the Home Secretary knew that certain prison doctors, irrespective of their capabilities or willingness, were being retired under peacetime regulations. Mr. H. MORRISON replied that the regulations relating to retirement of prison medical officers were the same as those relating to other Government servants. They gave discretion to retain an officer owing to war conditions. That the officer did not wish to retire was not by itself a reason for an extension.

Unregistered Insured Persons.—Mr. ERNEST BROWN, on June 10, informed Mr. Groves that he was unable to state the number of insured persons who failed to register with a medical practitioner in the past year. The total amount payable to insurance doctors for any year was determined after consultation with the Government Actuary and was based on his estimate of the total number of persons entitled to medical benefit on the average during that year without reference to the question whether they had selected doctors or not. Medical men therefore did not suffer financially as a consequence of non-registration.

Nervous Shock of a "Commotional Character."—Mr. WATKINS, on June 10, asked the Minister of Pensions if he would define the term "nervous shock of a commotional character," used by his Department in connection with the compensation payable under the Personal Injuries (Civilians) Scheme. Sir WALTER WOMERSLEY said: The term "nervous shock of a commotional character" as used by his Department referred to nervous shock resulting directly from physical violence, including concussion, blast, or burial.

Notes in Brief

Statistics as to the death rate do not distinguish between evacuated children and native children. All the evidence available, however, goes to show that, in general, evacuation has had a beneficial effect on children's health. Mr. Brown has no information to suggest that the accident rate among evacuated children was higher than among other children

Universities and Colleges

UNIVERSITY OF OXFORD

The following medical degrees were conferred in Convocation on June 7:

D.M.—J. E. G. Pearson; R. D. Harding (preceded by B.M.).

UNIVERSITY OF CAMBRIDGE

At a Congregation held on June 7 the degree of M.D. was conferred on J. O. Poynton.

Diploma in Medical Radiology and Electrology

The Committee for Medical Radiology and Electrology has reported to the following effect: On the representation of the Director-General A.M.S., that the discontinuation of the diploma (D.M.R.E.) in 1941 would seriously affect the training of radiologists for service with the R.A.M.C., the University continued the examinations after October 31 last. However, only eight candidates attended the course for the year 1940-1, and the deficit for that year will be about £400. Since there will be no oversea candidates, and newly qualified men are liable to be called up, the committee, with great regret, recommends that the diploma be discontinued as soon as possible, and that no examination for it be held after October 31, 1942. The Faculty Board of Medicine has approved this report of the committee.

UNIVERSITY OF ABERDEEN

The summer graduation ceremony has been fixed for Thursday, July 10.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—R. M. Ellison, A. L. H. Smith.

MEDICINE.—R. M. Ellison, S. G. L. Klein, N. A. St. C. Marley, G. H. Miles, W. H. Morgan, G. M. Pearson, O. Sookias, W. J. U Tin.

FORENSIC MEDICINE.—R. M. Ellison, S. G. L. Klein, N. A. St. C. Marley, G. H. Miles, W. H. Morgan, G. M. Pearson, O. Sookias, W. J. U Tin.

MIDWIFERY.—R. M. Ellison, W. H. Morgan.

The diploma of the Society has been granted to R. M. Ellison, S. G. L. Klein, N. A. St. C. Marley, G. H. Miles, W. H. Morgan, A. L. H. Smith, O. Sookias, and W. J. U Tin.

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 17.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for (a) England and Wales (London included) (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of *Births and Deaths, and of Deaths recorded under each infectious disease*, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	1941 (b)	1941 (c)	1941 (d)	1941 (e)	1940 (Corresponding Week) (a)	1940 (b)	1940 (c)	1940 (d)	1940 (e)
Cerebrospinal fever	284	15	55	2	12	334	28	77	—	12
Deaths		5	6				2	5		
Diphtheria	926	38	191	41	41	676	26	251	42	33
Deaths	25	3	6	—	2	15	—	5	—	5
Dysentery	77	9	43	—	—	38	8	33	—	—
Deaths										
Encephalitis lethargica, acute	2	—	2		—	5	—	2		—
Deaths								3		
Enteric (typhoid and paratyphoid) fever	34	4	31	6	—	46	2	10	16	1
Deaths	—	—	—	—	—	1	—	—	—	—
Erysipelas			50	7	4			52	2	4
Deaths			—				1	—		
Infective enteritis or diarrhoea under 2 years	36	5	8	8	7	29	6	4	8	8
Deaths				—	—	5	—	3	—	3
Measles	11,909	341	151		4	6,549	24	722	—	—
Deaths	17	—	1		—					
Ophthalmia neonatorum	80	4	17		2	83	8	37		—
Deaths										
Pneumonia, influenzal*	1,067	44	11	7	2	719	17	11	4	4
Deaths (from influenza)	21	2	4	3	6	25	3	3	—	2
Pneumonia, primary			290	15				234	16	12
Deaths		—		15	—		30		11	
Polio-encephalitis, acute	1	—					1	—		
Deaths		—	—	—	—	3	—			
Poliomyelitis, acute	2	—	—	1	—			—	1	1
Deaths		—	—	—	—	7	7			
Puerperal fever		—	8	3	—		1	12	1	—
Deaths		—	—							
Puerperal pyrexia	126	10	11		—	153	11	20		—
Deaths										
Relapsing fever					—					—
Deaths										
Scarlet fever	1,153	45	152	45	23	875	32	157	38	50
Deaths	—	—	2	—	—					
Small-pox										
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever										
Deaths	—	—	—	—	—	—	—	—	—	—
Whooping-cough	4,066	143	521	2	4	503	3	48	1	13
Deaths	27	2	17		1	2				4
Deaths (0–1 year)	405	37	71	36	20	342	47	66	20	28
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	7,235	1,665	692	233	221	4,476	731	674	183	166
Annual death rate per 1,000 persons living			15.1	15.5	19.4			12.8	12.2	14.6
Live births	5,216	416	927	313	209	6,983	1,168	957	312	264
Annual rate per 1,000 persons living			18.9	20.8	18.3			19.4	20.8	23.2
Stillbirths	219	18	46				242	35	41	
Rate per 1,000 total births (including stillborn)			47						41	

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The returns for the week under review showed a slight rise in the incidence of the common infectious diseases, with the exception of measles in England and Wales and cerebrospinal fever in Scotland.

Scarlet Fever

The 1,153 notifications of scarlet fever in England and Wales were 141 in excess of those for the preceding week. The highest rise occurred in Lancaster, where the cases increased from 132 to 190; the increase was generally distributed throughout the county. In Scotland 152 cases were notified, an increase of 10. A third of the total cases were contributed by the two cities of Edinburgh, 20, and Glasgow, 28.

Dysentery

The notifications of dysentery in England and Wales numbered 77, an increase of 5. The largest of the new local outbreaks was in Uttoxeter U.D., Staffordshire, with 11 cases. In Lancaster, Whiston R.D., 8 further cases were recorded during the week. There were 9 in London, 6 being in Wandsworth. Of the 8 cases reported from Yorks, West Riding, 4 were contributed by Bradford C.B. and 3 by Wakefield C.B. In Scotland 43 cases of dysentery were notified, 11 more than in the previous week.

Cerebrospinal Fever

An increase of 18 cases occurred in the notifications of cerebrospinal fever in England and Wales, after the sharp fall in the incidence during the preceding week. In Cheshire the cases rose from 12 to 20, and in Lancashire from 42 to 52. In the former the cases were scattered throughout the county, but in the latter the increase was contributed by Liverpool C.B., where the figures rose from 7 to 18. In Scotland 55 cases were reported, a decrease of 10. Glasgow, with 13 cases, had one-quarter of the total incidence.

Diphtheria

The notifications of diphtheria during the week in England and Wales were 926—68 above the total for the previous week. Lancaster and Staffordshire had the largest increases. The figures rose from 129 to 204 in Lancaster, and, as with scarlet fever, the disease was widespread; no district had a heavy attack. The relatively large increase in the notifications of Staffordshire, from 25 to 67, marked the highest level reached this year in that county. The increase was due to an outbreak in Seisdon R.D., where 38 cases were recorded during the week, the first occurring in this area for three months. In Scotland notifications amounted to 191, an increase of 20. The increase was fairly general throughout the country.

Measles

The number of cases of measles notified in England and Wales was 11,909, a decrease of 84 compared with the preceding week. Several counties have recorded an increasing prevalence during the past three weeks. Probably the most noteworthy are those of the rural districts of Norfolk, Suffolk, and Sussex. The number notified during the last three weeks in East Sussex, Uckfield R.D., was 48, 79, and 175; and in West Sussex, Chanctonbury R.D., 8, 13, and 60. A considerable increase in the notifications of measles in Scotland, from 96 to 151, was reported following the large decrease recorded in the preceding week. The experience of Glasgow was mainly responsible for the increased number.

Whooping-cough

The number of cases of whooping-cough in England and Wales has been remarkably constant during the past three weeks, the notifications being 4,088, 4,081, and 4,086. The totals recorded for the counties have shown some fairly sharp variations. Notifications in Warwickshire have been halved in this period, due mainly to the experience of Birmingham C.B., where the figure has fallen from 136 to 67. No consistent increase has been recorded for any county. A rise of 30 was

reported from Scotland, where Glasgow dominates the returns, accounting for 415 of the 521 cases. The highest increase was shown by Dundee from 9 to 27.

Typhus Fever

Following the outbreak of typhus fever in the Carrowmere district of West Clare, Eire, 10 actual cases and 34 contacts have been removed to the isolation hospital. Two patients have died. The outbreak is centred round about a dozen houses, and it has been proposed that these hovels should be burned down.

Medical News

Dr. Karl Landsteiner, of the Rockefeller Institute for Medical Research, New York, famous for his work on blood grouping and the specificity of serological reactions, has been elected a Foreign Member of the Royal Society.

A general meeting of the Medical Society for the Study of Venereal Diseases will be held at 11, Chandos Street, W., on Tuesday, June 24, at 2.30 p.m., when Dr. I. N. Orpwood Price will give an address on "The necessity of the clinician making the best use of laboratory facilities in the diagnosis of venereal diseases and simple methods of doing so."

A Chadwick Public Lecture on "The Interrelation of Man and Fungus in Health and Disease" will be delivered by Mr. J. Ramsbottom, D.Sc., at the Chelsea Physic Garden, Swan Walk, S.W., on Thursday, June 19, at 4 p.m.

The Long Fox Memorial Lecture will be delivered by Dr. H. H. Carleton, F.R.C.P., at 8.30 p.m., on Tuesday, June 24, in the Wills Physics Theatre, Bristol University. Subject: "The Methods of Science."

A lecture entitled "The Nature of the Self" will be delivered before the British Institute of Philosophy by Prof. H. H. Price of New College, Oxford, at University Hall, 14, Gordon Square, London, on Friday, June 20, at 5 p.m. Tickets can be obtained on application to the Director of Studies at 14, Gordon Square, W.C.1.

Two papers on Navy and Air Force Welfare will be read at the Royal Society of Arts, John Adam Street, Adelphi, W.C., on Wednesday, June 18, at 2.30 p.m., by Captain R. W. Blacklock, R.N., Personal Services Department, Admiralty, and Group Captain F. C. Halahan, Personal Services Department, Air Ministry.

Until further notice the House and Library of the Royal Society of Medicine will open at 9.30 a.m. and close at 6.30 p.m.

The June number of the *Proceedings* of the Royal Society of Medicine will contain in the Section of Medicine a discussion on "The Nature and Treatment of the Effort Syndrome" by Dr. H. J. Starling, Dr. Paul Wood, and Dr. Maxwell Jones, and in the Section of Psychiatry a paper by Dr. Aubrey Lewis on "Psychiatric Aspects of Effort Syndrome." These two reports will be issued as a combined reprint at 1s. a copy, post free. Early application should be made to the Editorial Office, 1, Wimpole Street, W.1.

The issues of the *Schweizerische Medizinische Wochenschrift* for March 15 and 22 are dedicated to Dr. W. R. Hess, professor of physiology at Zurich, on the occasion of his sixtieth birthday.

The Ministry of Food, on the advice of its Food Rationing (Special Diets) Advisory Committee, has decided that extra supplies of cheese will not be available to diabetics. It is held that the two extra meat and two extra butter or margarine rations instead of sugar make an adequate diet possible for all cases of diabetes.

It has been publicly announced that the "fortified" white loaf—bread reinforced with vitamin B_1 and calcium—will not be on sale for some time to come. A technical breakdown in the manufacture of vitamin B_1 has delayed distribution.

Dr. John O'Hara, medical practitioner, Stanhope, has received an expression of commendation for brave conduct in tendering services on the occasion of a serious lorry accident.

Dr. E. Ellan has been appointed an Honorary Sheriff-Substitute at Elgin of the Sheriffdom of Elgin, Nairn, and Inverness.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be addressed to the Secretary.

TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES: EDITOR, *Aitiology Westcent, London*; SECRETARY, *Medisecra Westcent, London*.

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Post-herpetic Neuralgia

Dr. C. S. SHEAHAN (Doncaster) writes: I was interested in the note on this subject (June 7, p. 876), for recently I have had two cases of severe neuralgia following herpes zoster. One patient, a man of 60, had a large crop of cervical herpes. He was left with severe neuralgia for five months. I gave him the usual analgesics, tonics, and vitamin concentrates, eventually resorting to electrotherapeutics, which, though affording temporary relief, tended to aggregate the condition. Whether or not the injection of pituitrin 0.5 c.cm. b.i.d. during the attack diminishes the possibility of post-herpetic neuralgia I don't know, but think it is worthy of trial for this troublesome condition.

Income Tax

Depreciation of Leasehold, etc.

"D.R." inquires what deduction should be made for depreciation of a 34-year lease or on the value of a practice.

*** No allowance is due as depreciation is allowable only in respect of "plant and machinery." The "loss" referred to in Sec. 34 of the Income Tax Act, 1918, is a general loss on the business or practice, i.e., the amount by which the gross earnings are less than the allowable expenses.

LETTERS, NOTES, ETC.

Deferment of Call-up of Dispensers

Mr. HUGH M. LINSTEAD (Secretary, Central Pharmaceutical War Committee) writes: Men whose age for the purpose of military service is under 35, and who were classified as dispensers when they registered under the National Service (Armed Forces) Acts, may, in exceptional circumstances, secure deferment of call-up. By arrangement with the Ministry of Health and the Ministry of Labour such applications will be considered by the Central Pharmaceutical War Committee. They should be addressed to the Secretary, the Ministry of Health, Division 1, B, Whitehall, London, S.W.1, so that they are received not later than July 1, 1941.

Maternal Expectancy

Dr. J. R. BENTLEY writes: In view of recent remarks in the *British Medical Journal* on certification, the following true episode may add to the lighter side of the discussion. *Scene*—The office of the Medical Officer of Health in a Rural Area. *Time*—10.15, on the day after the "couponization" of clothing came into force. *Very Expectant Mother*—"I want a certificate to buy material for diapers for my baby due next month."

Rapid Identification of Cl. welchii: Corrigenda

In Miss Nancy J. Hayward's paper on the rapid identification of *Cl. welchii* by the Nagler reaction (*Journal*, May 31) four serious errors occur, due to the loss of the author's corrected proofs in a recent air raid. These errors are: (1) page 812, under the heading Modified Brewer's Medium, "agar and 0.01% sodium thioglycollate," which should read "agar and 0.1% sodium thioglycollate"; (2) page 812, Table II, column 6, "F + T, *Art*," which should read *F + A, Aer*"; (3) page 812, subscript to Table II, "T = 0.01% sodium thioglycollate," which should read "T = 0.1% sodium thioglycollate"; and (4) page 814, line 20, "the finding of Cook," which should read "the finding of *Crook*."

Dr. J. D. ROLLESTON (London, W.8) writes: I regret that the "slight error" in connection with the date of the International Congress of the History of Medicine held in London was wrongly attributed by me (*Journal*, June 7, p. 874) to you instead of to the *Lancet* in its issue of May 31, p. 703.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY JUNE 14 1941

CERTIFICATES FOR EXTRA MILK

We have received a number of criticisms (some of which have been published in these columns) of the certificates which doctors are now asked to sign to secure additional milk for those of their patients who are suffering from certain defined conditions. The letter we publish at page 80 from a provincial food office to a local doctor so misrepresents the steps taken by the B.M.A. in this matter that the following statement is called for.

The first official intimation the B.M.A. received that the Ministry of Food intended to restrict the general consumption of milk was contained in a letter from the Ministry dated April 3, 1941, which stated that the restriction would begin on April 13 (ten days later), but that, following the advice of the Special Diets Committee of the Medical Research Council, special provision would be made for persons suffering from (*a*) active tuberculosis of all types and of all organized tissues; (*b*) silicosis; (*c*) conditions in which the patient is unable to swallow solid food by reason of an affection of the mouth, throat, or gullet; (*d*) gastric, duodenal, or anastomotic ulcer; (*e*) illnesses characterized by high and prolonged fever; (*f*) post-operative conditions after major operations. It further stated that the restriction would be promulgated by an Order to be "issued within the next few days," and would provide in a schedule a prescribed form of medical certificate. While it was indicated that the certificate would be handed by the doctor to the householder for transmission to the dairyman, it was not made clear that it would divulge the exact nature of the patient's illness. The letter concluded by saying that "notices for the use of the medical press would be issued shortly, but it was thought the B.M.A. would wish to be advised before these were issued"—that is, less than ten days before the restriction was to come into force. The Secretary of the B.M.A. telegraphed for copies of the Order and the certificate, and the Ministry, on April 17, supplied stencilled copies, as printed ones "were not yet available."

The Council of the B.M.A., at a meeting on April 23, had before it both the Ministry's Order and a copy of the medical certificate, and in a letter to the Ministry dated April 29 the Secretary made the following observations and criticisms on behalf of the Council: (1) The list of diseases was too rigid; doctors should be allowed in exceptional circumstances and under appropriate safeguards to issue a certificate for additional milk for persons under their care. Further, there were people without specific diseases who were eligible. (2) Application by the doctor at the Food Office for certificates placed an unnecessary burden on him. (3) The disclosure of the particular disease might prove embarrassing, and it was unfortunate that the dairyman had to be informed of the nature of the disease. (4) It was particularly unfortunate that the Association was not given an opportunity before the Order was issued to express its views, representing as it did the majority of practising doctors in the country.

Briefly the Ministry's very full reply to these criticisms, dated May 3, was as follows:

1. To make the scheme effective the circumstances in which the additional supply of milk should be allowed would need to be rigidly prescribed, otherwise there would be no effective control. The Special Diets Committee had agreed that it was desirable, in order to prevent abuse of the concession and to relieve the doctor of the need for making the decision whether the full allowance was essential or merely desirable, that the diseases should be defined as precisely as possible.

2. The arrangement that doctors should obtain certificates from the local Food Offices was designed to simplify the working of the scheme; it was expected that they would obtain a supply to be used as and when required.

3 The handing of the certificate to the dairyman was again directed by the desire on the part of the Ministry to make the procedure as simple as possible. An alternative method—namely, that the doctor should hand the certificate to the local Food Office—might lead to delay. "The Ministry believes that there must be several cases in which a certificate specifying the nature of the disease is handed to the patient for transmission to a third party."

4 The Ministry's letter of April 3, in which the scheme was "fairly fully described," was sent to the Association within two or three days of receiving the advice of the Special Diets Committee: "it was regrettably impossible to give any further notice of contemplated arrangements."

On May 28 the Secretary of the B.M.A. sent the following letter to the Ministry.

Letter from B.M.A. to Ministry of Food

Dear Sir, May 28, 1941.

I have to thank you for your letter of May 3 concerning the Sale of Milk (Restriction) Order, 1941. Before sending you this reply I have discussed the subject further with the appropriate committee of the Council and I am instructed to submit to you the following observations and recommendations for your early consideration.

List of Diseases

(a) Active tuberculosis of all types and of all organized tissues.

The committee is at a loss to know what is intended by the words "organized tissues"; presumably it means organs. It suggested that "active tuberculosis of all types" is sufficiently comprehensive.

(b) Silicosis

This was accepted.

(c) Conditions in which the patient is unable to swallow solid food by reason of an affection of the mouth, throat, or gullet.

The committee considers that there are many other conditions which would cause interference with swallowing—for example, myasthenia gravis, progressive bulbar palsy, and certain mental states. The committee recommends the following:

"Affection of the mouth, throat, or gullet, or organic nervous disorder causing interference with swallowing."

(d) Gastric, duodenal, or anastomotic ulcer.

The committee recommends the addition of chronic dysentery and ulcerative colitis.

(e) Illnesses characterized by high and prolonged fever.

This was accepted.

(f) Post-operative conditions after major operations.

The committee makes the following observations: (1) Most major operations take place in institutions, which are not affected by the Order. (2) In most cases extra milk is necessary only for the first few days, and if the patient is not in an institution the extra milk might well be provided by other members of his family.

If the heading is retained it is suggested that a time limit of one month should be imposed.

(*g*) The committee considers that acute nephritis and advanced stages of malignant diseases should be added to the list.

Procedure

The committee is glad to have your assurance that the medical practitioner may obtain a supply of certificate forms from the local Food Office for use as and when required.

The committee considers it most undesirable that the certificate should be given to the dairyman. It recommends that the certificate should be sent by the practitioner to the medical officer of health, who should issue an authority to the dairyman to supply the extra milk. The certificates should be sent in "business reply" envelopes, supplies of which should be obtainable with the certificate forms from the Food Office.

Although the certificate contains a space in which the practitioner is to insert the period for which the extra milk is necessary, the committee suggests that a time limit for the validity of the certificate should be imposed and it recommends a period of at least two months.

With regard to instruction (A) on the back of the certificate, it is presumed that all that is required is that the practitioner's diagnosis should be sufficiently clear to enable the medical officer of health, acting as agent for the Ministry of Food, to identify the category. The committee therefore suggests that it is unnecessary for the practitioner to waste the time involved in writing the full descriptions indicated in the examples given. It recommends that an entry such as " (C) Cancer of the oesophagus " is sufficient.

Debilitated Children

The committee regrets the absence of provision for the supply of extra milk for certain groups of undernourished children of school age. Children at State-aided schools who are eligible to receive milk under the milk-in-schools scheme receive it while they attend school but do not receive it if they are too ill to attend. If they are ill it is all the more necessary for them to have the milk, and the committee considers that their position should be recognized either under the Sale of Milk (Restriction) Order or in some other way. It is not always possible for other members of the child's family to allocate a sufficient share of their available milk. The committee suggests that a simple way of meeting the position would be to allow the mother or other relative to go to the school to fetch the child's milk.

The other group of children for whom the committee considers some provision ought to be made consists of the undernourished children attending private schools. It is not now a question of ability or inability to pay for extra milk, and the committee considers that the undernourished child in a private school should be accorded the same treatment as children attending State-aided schools. It suggests that an extra supply of milk should be authorized on the certificate of a medical practitioner that the child is undernourished.

Distribution of Milk

While, the committee appreciates the importance at the present time of restricting the consumption of milk, it requests me to draw your attention to its opinion that the distribution is very unequal and that the method adopted by the Ministry to reduce consumption has not removed the inequalities. It will be remembered that earlier in the winter the Minister appealed to the public to reduce their consumption of milk. Many people did so, others did not. Thus, as a result of the selection of the first week in March as the basic week, some people are suffering a reduction in supplies which they had already reduced to a minimum, while other people who had made no voluntary reduction suffer very little inconvenience. The committee believes that the only way to secure equality is to establish a basic ration per person which should not be subject to any reduction. In the absence of information on the supplies of milk available in the country both now and for next winter it is, of course, impossible to suggest a basic ration, but the committee wishes me to convey to you its opinion that on medical grounds all who wish should be able to purchase 1/2 pint of milk a day. It also believes that if the Minister would reduce the maximum daily amount that any person may receive without a medical certificate to 1 pint a day the saving would enable him to assure a basic ration of 1/2 pint to all who wish to purchase that quantity.

I shall be glad to have your views on these suggestions at your early convenience.

Yours faithfully,
(Signed) G. C. ANDERSON,
Secretary.

GENERAL MEDICAL COUNCIL

DISCIPLINARY INQUIRIES

(Concluded)

Convictions for Drunkenness and Cognate Offences

PHILIP ARDERN ASHCROFT, registered as of Littleborough, Manchester, was summoned on the charge that in February, 1939, he had been convicted of driving a motor-car whilst under the influence of drink. There was a similar conviction in 1933. Dr. Ashcroft apologized for the circumstances which had brought about these convictions, stated that he was now a teetotaller, and put in a number of testimonials. The Council did not see fit to erase the name.

PATRICK KENNEDY, registered as of South Harrow, appeared on three convictions, one in 1931 of being in charge of a car when under the influence of drink, one in 1939 of being drunk and incapable, and one in 1940 of being under the influence of drink to such an extent as to be incapable of having control of a motor-car. Dr. Kennedy said that he was sorry these events had happened, and he put in certain testimonials. The Council postponed judgment on the usual conditions until May, 1943, but required Dr. Kennedy to appear in May, 1942, and to furnish testimonials as to his conduct in the interval.

Other Convictions

MAURICE PERLMAN, registered as of Market Place, Chippenham, appeared on a conviction of having obtained small sums of money by false pretences. He was placed on probation for twelve months.

SADIC MIKHAIL, registered as of Alderney Road, Mile End, London, appeared on a conviction of having used insulting words at the entrance to a public shelter during an alert. It was stated that he had refused to move at the request of a constable. Dr. Mikhail said he was a doctor appointed to the shelter and to the first-aid post. He was waiting at the entrance to the shelter merely to get his eyes accustomed to the darkness when the constable told him to get out and pushed him. He denied having used insulting words. The Council did not see fit to erase the name.

Adultery and Professional Relationship

The Council considered the case of RICHARD CHRISTOPHER HOWARD, registered as of 104, Harley Street, who appeared on the charge of having committed adultery with Edith Ellaline Hart-Davis, a married woman, of which adultery he had been found guilty by decree of the Divorce Court, and that he had stood in professional relationship with the said Mrs. Hart-Davis from November, 1934, until July, 1938, and with her husband from November, 1934, until December, 1937. The case was brought before the Council by Mr. Hart-Davis, who was represented by Mr. Woolfe, solicitor.

Dr. Howard admitted that he was in professional attendance during the periods mentioned, but he strongly denied having committed adultery. In reply to the President, who pointed out that the Divorce Court had found him guilty of adultery, Dr. Howard said that it was possible to care quite a lot for a person without committing adultery, that sometimes the position of anybody who decided, rightly or wrongly, that it was his job to help two unhappy people became impossible, and that it was in certain circumstances out of the question for a doctor who believed in the Hippocratic oath and was not willing to betray professional confidences to defend himself adequately.

The Council found that Dr. Howard had been guilty of infamous conduct in a professional respect, and instructed the registrar to erase his name.

JAMES LESLIE HILL, registered as of Chepstow Road, Newport, Mon., appeared before the Council on the charge of having committed adultery with Gwenda Margaret Watson, a married woman, of which adultery he had been found guilty by decree of the Divorce Court, and that he had stood in professional relationship with the said Mrs. Watson at all material times. Dr. Hill was defended by Mr. Oswald Hempson, solicitor.

Dr. Hill in the witness box admitted that he had been properly found guilty of adultery, but he claimed that adultery had taken place before either the lady or her husband was his patient. Mr. Watson had become his insurance patient in October, 1937, and the first attendance on Mrs. Watson was in July, 1938, but misconduct was committed in August, 1937.

Mr. Hempson pointed out that Dr. Hill had already been punished severely, having had to sell his practice at far below its value, and to pay £750 damages. He had now married Mrs. Watson, and they were living happily together. Adultery took place before either of these people became his patient, and in fact he was not the lady's doctor until twelve months after the association began.

The Council judged Dr. Hill to have been guilty of infamous conduct in a professional respect, and instructed that his name be erased.

Dental Cases

Two dentists were erased from the *Dentists Register* on the recommendation of the Dental Board, namely, James Harold Hill, registered as of Lea Bridge Road, London, E., who had been convicted of larceny and of obtaining credit by fraud, and John Harold Smith, registered as of Clay Cross, who was found to have employed as agent for the purpose of procuring patients a certain unregistered person.

In a further case, that of William Hope, registered as of Bristol Road, S.W., who had been convicted of a misdemeanour (which he strongly denied), the Council, after hearing the respondent, decided not to accept the Dental Board's recommendation, and did not see fit to instruct the Registrar to erase the name.

MEDICAL WAR RELIEF FUND

SEVENTEENTH LIST

Previously acknowledged £24,246 10s. 7d. and £100 3½% Conversion Stock

Individual Subscriptions

£5 5s.—Dr. D. (Qu.), Leicester, Dr. I. M. Dyer, Newport, Dr. P. [illegible], A. H. Knighton, Wonersh, Dr. G. Shearer, S. Yorks, Dr. H. [illegible], Friar Oaks.

£5.—Dr. A. McK. Fleming, Gibraltar, Dr. R. Lang, Gibraltar.

£4 16s. 6d.—Women's Aspen Mare Provident Medical Aid Association.

£3 3s.—Miss Margaret Moore White, London.

£2 2s.—Dr. D. E. J. Mitchell, Manchester, Dr. F. J. T. [illegible], Wrightington Hospital.

£2.—Dr. and Mrs. A. B. Friel, Sidmouth, Medical Staff, Harrogate Hospital.

£1 1s.—Dr. L. Ball, Manchester, Mr. R. Bett, Jarrow, Dr. [illegible], G. D. Shann, Oxford.

10s.—Dr. E. Croft Watts, Middlesbrough.

£355 14s.—Per Dr. A. J. Brackenbury, Bromsgrove, Dr. [illegible], Mastery, £5 5s.; Dr. D. J. Nicol, £1; Dr. T. L. Hall, [illegible], Stewart, £5 5s.; Dr. R. H. Pearce, £1 1s.; Dr. A. G. [illegible], Dr. A. Kerr, £5 5s.; Dr. M. F. Dewar, £1; Dr. [illegible], Dr. F. A. L. Burges, £10 10s.; Dr. C. [illegible], Dr. [illegible], £5 5s.; Dr. J. R. Thomson, £5 5s.; Dr. A. [illegible], Nevin, £5; Dr. A. P. Thomson, £1 1s.; Dr. [illegible], J. F. Good, £2 2s.; Dr. [illegible], Dr. D. M. Hasell, £5 5s.; Dr. [illegible], Gates, £1 1s.; Dr. E. C. Aspinall, £10 10s.; Dr. [illegible], W. S. L. Dent, £5; Dr. F. C. Mayers, £1; Mr. L. [illegible], Dr. J. R. A. Tomlinson, £5 5s.; Dr. J. [illegible], Dr. [illegible], McCarter, £5 5s.; Dr. H. W. Dunsmuir, £1 1s.; Dr. [illegible], Dr. R. W. Watson, £1 1s.; Mr. Fawcett, £1 1s.; Dr. [illegible], Dr. [illegible], £2 2s.; Dr. C. Becker, £2 2s.; Dr. [illegible], £2 2s.; Dr. S. Lewis, £10; Dr. H. Walker, £2 2s.; Dr. [illegible], F. E. Stuart, £1 1s.; Dr. H. [illegible], Prof. G. J. Emanuel, £10 10s.; Mr. A. W. H. [illegible], £1 1s.; Dr. W. Cawood, £10 10s.; Dr. J. S. [illegible], Dr. [illegible], Hesse Wylie, £5; Dr. W. J. H. Stokes, £5 5s.; Dr. [illegible], Dr. S. H. Reeves, £5; Dr. R. T. Bannister, £5 5s.; Dr. [illegible], Dr. [illegible], Cuff, £5 5s.; Dr. D. W. A. Wilson, £5 5s.; Dr. [illegible], J. H. McBrien, £5 5s.; Dr. [illegible], £2 2s.; Dr. [illegible], £5 5s.; Dr. M. Sanders, £2 2s.; Dr. T. D. Cooper, £1 1s.; Prof. W. Gemmell, £5 5s.; Dr. [illegible], £5 5s.; Dr. F. Graham, £5 5s.; Dr. [illegible], £2 2s.; Dr. L. Bellman, £5; Dr. J. H. Gardiner, £2 2s.; Dr. [illegible], £5 5s.; Dr. L. Ball, £1 1s.; Dr. J. D. Newton, £2 2s.; Dr. [illegible], Greig, £5 5s.; Dr. F. J. Nugent, £5; Dr. [illegible], Birmingham Public Medical Service, £10 10s.; Dr. [illegible], Oakfield Medical Society, £10 10s.; Dr. [illegible], £5 5s.

£347 19s.—Practitioners in area of Belfast Division—per Dr. [illegible], Dr. S. Reid Campbell, £5 5s.; Dr. A. McCann, £2 2s.; Dr. H. J. [illegible], Dr. [illegible], £2 2s.; Dr. S. E. Acheson, £2 2s.; Dr. D. G. [illegible], Hicker, £2 2s.; Dr. H. [illegible], £5 5s.; Dr. [illegible], Dr. [illegible], Markham, £5 5s.; Dr. J. R. Gillespie, Corker, £5 5s.; Dr. [illegible], Dr. J. C. Rabb, £5 5s.; Dr. [illegible], Dr. [illegible], £5 5s.; Dr. J. Unsworth, £2 2s.; Dr. J. H. Stewart, £2 2s.; Dr. [illegible], Irvine, £2 2s.; Dr. S. W. Allworthy, £2 2s.; Prof. W. D. Thomson, £5 5s.; Dr. [illegible], Dr. H. J. O'Prey, £2 2s.; Dr. S. P. Armstrong, K. Darnell, £5 5s.; Dr. [illegible], Mitchell, £5 5s.; Dr. [illegible], Dr. C. W. G. [illegible], £2 2s.; Dr. [illegible], Mr. C. J. A. Woodall, £2 2s.; Dr. D. J. [illegible], £5 5s.; Dr. [illegible], Dr. [illegible], Bell, £5 5s.; Dr. J. McVicker, £1 1s.; Dr. J. M. [illegible], Dr. [illegible], Stewart, £1 1s.; Dr. W. E. N. Galbraith, £2 2s.; Dr. [illegible], A. Porter, £2 2s.; Dr. W. N. Calwell, £2 2s.; Mr. C. H. G. Macafee, £5 5s.; Dr. [illegible], Dr. J. W. Nesbitt, £2 2s.; Dr. J. F. Craig, £2 2s.; Dr. R. R. Clarke, £5 5s.; Dr. [illegible], Dr. [illegible], £1 1s.; Dr. J. [illegible], Dr. [illegible], C. W. Mosgrave, £1 1s.; Dr. T. A. Greene, £5 5s.; Mr. J. R. Whitaker, £5 5s.; Dr. M. I. Rowberry, £2 2s.; Dr. [illegible], Dr. [illegible], Montgomery, £10 10s.; Mr. T. S. [illegible], Dr. [illegible], Dr. W. [illegible], Mary Gresham, £2 2s.; Mr. T. [illegible], Dr. W. Armstrong, £2 2s.; Dr. J. C. [illegible], Dr. [illegible], Mr. J. Armstrong, £2 2s.; Mr. A. Anderson, £1 1s.; Dr. J. [illegible], Dr. [illegible], £5 5s.; Dr. O. M. A. Pentland, £2 2s.; Dr. [illegible], Dr. J. S. Morrow, £5 5s.; Dr. R. A. [illegible], Dr. [illegible], Dr. J. A. Smith, £5 5s.; Dr. J. Lee, £5 5s.; Dr. [illegible], Dr. [illegible], £2 2s.; Mr. G. A. Craig, £2 2s.; Dr. P. J. Moore, £5 5s.; Dr. [illegible], Dr. [illegible], £1 1s.; Dr. V. G. H. Nicholas, £5 5s.; Mr. J. A. Price, £5 5s.; Dr. [illegible], Dr. [illegible], £5; Dr. J. H. McCaw, £5 5s.; Mr. J. B. Stewart, £5 5s.; Dr. [illegible], Dr. [illegible], £1 1s.; Dr. D. Gray, £5 5s.; Dr. J. B. Stewart, £5 5s.; Dr. [illegible], Dr. [illegible], M. H. H. Greer, £5 5s.; Prof. W. J. Wilson, £5 5s.; Dr. [illegible], Dr. [illegible], £2; Drs. J. C. and P. M. Neave, £3 3s.; Dr. S. A. [illegible], Dr. [illegible], £1 1s.; Dr. H. A. Wanless, £2 2s.; Capt. J. W. B. [illegible], Dr. [illegible], C. S. Thomson, £2 2s.; Dr. W. M. Lowthrie, £2 2s.; Mr. C. L. [illegible], Dr. [illegible], Gilmore, £2 2s.; Dr. W. M. [illegible], Dr. [illegible], G. J. V. Forrest, £5; Dr. D. R. Taylor, £5 5s.; Dr. [illegible], Dr. [illegible], £2 2s.

£204 18s.—Practitioners in Halifax and District—per Mr. H. I. Deitch, Dr. C. W. Alderman, £5 5s.; Dr. L. G. Allan, £5 5s.; Dr. J. B. Brown, Drs. Bolton & Fellows, £6 6s.; Dr. F. M. Brook, £5; Dr. J. B. Brown, £5 5s.; Dr. M. J. Canty, £5; Dr. A. H. Cegg, £3 3s.; Dr. W. Craven, £5 5s.; Dr. G. A. Crowther, £3 3s.; Dr. H. Davidson, £5; Dr. J. R. Denning, £2 2s.; Dr. T. M. Crawford, £5 5s.; Dr. H. Dawdall, £6 6s.; Drs. F. D. and Dorothea Dean, £5 5s.; Mr. H. I. Deitch, £5 5s.; Dr. Dewdall, Pollitzer and Petersen, K.S. Doe, £10 10s.; Dr. and Mrs. F. J. Draham, Garsill, Francis, £5; Dr. S. E. D. Ellis, £5 5s.; Dr. Emblin, Mr. W. J. W. Greenwood and Barlow, Dr. C. E. Forster, £3 3s.; Mr. W. H. Heseltine, W. O. S. Hornby, H. Jones, £4 4s.; Dr. L. Glick, £10 10s.; Dr.

MEDICAL INSURANCE AGENCY

The annual meeting of the Medical Insurance Agency was held on May 26, Sir Humphry Rolleston in the chair. The report of the Committee of Management, together with the audited accounts and balance sheet for 1940, were submitted and adopted. The effects of the war naturally caused a serious falling off in the volume of business and in the surplus profits available for the medical charities, but it was felt that the report was, in the circumstances, surprisingly good, and a vote of appreciation was minuted to the staff for their untiring efforts. The meeting decided to reserve £200, approximately, to meet E.P.D. for 1939, and £375 for a similar purpose in respect of 1940. After a further reserve towards income tax for 1940, there remained a balance of £2,250, in round figures, to satisfy "covenants" entered into with the charities of a total of £2,500. It was decided to pay nine-tenths of the covenanted sums—namely, £1,800 to the Royal Medical Benevolent Fund, and £450 to Epsom College Foundation. In each case the charity will recover an equal amount as a result of the covenant, so that they will in fact receive double these amounts. It was also decided to allocate £514 to increase the endowment of the Squire Sprigge (Girls' Scholarships) Fund. Dame Barrie Lambert, Dr. G. C. Anderson, Dr. J. W. Bone, Dr. John d'Ewart, and Dr. Henry Robinson were re-elected members of the Committee of Management for a further period of three years. The meeting terminated with a vote of thanks to Sir Humphry Rolleston.

Correspondence

Milk Certificates

SIR,—I would ask you to publish the following correspondence for the information of other members of the B.M.A., and also the medical members of Parliament. The discrepancy between the Parliamentary reply and the letter from the Government Department appears to need some clarification.—I am, etc.,

Norwich, May 28. B. R. BRAMWELL, M.D., M.R.C.P.

Copy of Letter from Dr. B. R. Bramwell, Norwich, to Local Food Executive Officer

Sale of Milk Restriction Order, 1941—Milk Certificate

Dear Sir,—I beg to bring to your notice a requirement of this form which I consider to be incompatible with professional ethics—namely, that under (2) of the medical certificate I am required to disclose to the milkman and all and sundry having access to the certificate that a patient of mine is suffering from tuberculosis. Such matters are personal to myself and the patient, except in so far as it is my statutory duty to notify, in confidence, to the M.O.H.

It is my intention, therefore, to use my discretion in completing this form until instructed to the contrary. Under no circumstances do I feel called upon to inform my patient and the milkman (both of whom may be blissfully in ignorance of the diagnosis) that a patient of mine is suffering from cancer or tuberculosis, such knowledge being frequently detrimental to the former and certainly nothing to do with the latter.—Yours faithfully,

April 18. (Signed) B. R. BRAMWELL, M.D., M.R.C.P.

Copy of Letter from Norwich Food Control Committee to Dr. Bramwell

Dear Sir,—Further to my letter of the 9th instant, the Ministry of Food have now informed me as follows:

"We have had a number of representations on this subject, but so far no objection to the procedure which we have outlined has been lodged by the British Medical Association. The B.M.A. was given full particulars of the scheme at the outset, and unless and until we hear from them that there are objections on the grounds of etiquette or otherwise, I do not think we shall change the existing arrangements."—Yours faithfully,

May 27. (Signed) BERNARD STORY, Food Executive Officer.

Copy of Letter from Dr. Bramwell to Local Food Executive Officer

Dear Sir,—I am greatly obliged to you for your letters on this subject. The communication from the Ministry of Food, quoted in your letter of the 27th, does not seem to be in accord with page 764 of the *B.M.J.* of May 17, 1941, and marked in ink, "Medical Notes in Parliament," which I enclose.

I might add that letters have appeared in the *B.M.J.* on the subject, and I am at a loss to understand any body of medical men agreeing to such a form being passed for use. Nor does the reply of Major Lloyd George indicate that the B.M.A. did in fact pass it. If, on the other hand, the B.M.A. did pass the form, then it certainly does not represent myself, though I am a member.

It is my intention to send to the B.M.A. copies of my letter to you and the Ministry's communication to you on the matter.—Yours faithfully,

May 28. (Signed) B. R. BRAMWELL.

* * This matter is referred to at page 77 of the *Supplement*.—ED., *B.M.J.*

Increase in Private Fees

SIR,—There seems to be a spate of letters to the *B.M.J.* giving an impression that doctors are mainly concerned with the matter of remuneration. I agree with the opinions expressed by Dr. E. D. Granger (*Supplement*, May 31, p. 71). I also think that, provided the Government would treat requests (for increased wages) from other sources in a similar manner, they would be justified in not raising the capitation fee at present. With regard to the hardships of doctors in reception areas; granted we have to see many evacuees for nothing and panel patients who have lost their medical cards, sign milk forms, etc. We must admit that our environment more than compensates for this. My pet grouse is that the payment for attending unaccompanied evacuated children is very belated; but perhaps it could be arranged to coincide with the next demand for income tax.—I am, etc.,

Kennington, near Oxford, June 1. G. D. SHANN.

Free Choice of Doctor

SIR,—Dr. Marwood's article (*Supplement*, May 17, p. 66) is written with almost disarming fairness, but it cannot escape criticism. He begins by stating that "State Medical Service . . . cannot come too soon provided the stultifying influence of civil service methods is avoided," and that "a multitude of problems have to be tackled before conception is translated into practice." From the problems to be tackled he selects free choice of doctor. I have always assumed that this term is intended to mean the patient's right to change his doctor if he is not satisfied with him, but it has also come to be used as an easily expressed symbol of the existing conditions of general practice as opposed to a State service. It is proposed to change our existing system of practice for one that admittedly requires much reform. Why do this before we have found that it is not possible so to reform general practice that it may be improved in the way that is wanted? We should at least insist that civil service be reformed in the way Dr. Marwood very properly suggests before we think of allowing the practice of medicine to be submerged into it. I cannot see that we should be called upon to restrict free choice for the sake of this State service; rather should not the State, if it does take control, endeavour to find some means of satisfying the public desire for maintaining the valuable existing relationship between doctor and patient?

Dr. Marwood believes that it is possible to substitute faith in the profession as a whole for faith in the individual doctor, and cites in support the case of the hospital. Surely there are here two acts of faith: the one in the personal friend, the family doctor; the other in a body of selected specialists from which the patient seeks advice for some special illness and generally at the request or with the consent of the general practitioner. I do not understand why "insistence on the preservation of free choice of doctor" should militate against the effective working of a State Medical Service with its vaunted "manifold advantages of early diagnosis and prompt treatment divorced from financial anxiety." Surely these advantages are exactly what National Health Insurance provides, and with them that free choice of doctor which apparently a State Medical Service cannot give.

The waste of mileage and time in a system whereby several doctors are visiting the same district and even the same street on any one day is certainly a serious matter, though it is one that may, to a very considerable extent, be overcome by that reform of general practice which we must consider now, before we allow ourselves to be included in a State service. Among the reforms proposed are larger partnerships, some system of local voluntary groups or co-operation which would give us easier holidays and days off, easier attendance at post-graduate courses, and better division of work. We also need

more hospital beds for the G.P. and better pathological and consultant service under National Health Insurance; we should also participate in public health work.—I am, etc.,

CHARLES E. S. FLEMMING.

Bath, May 22.

Increased Health Insurance Benefits

SIR,—The statements in Parliament on increased benefits to insured patients with an intimation that a further half-million of the population is to acquire insured status must surely demand an immediate reconsideration of the remuneration for insurance practitioners. Up to this moment most of them have been content to accept the advice that, at a difficult moment in the nation's fortunes, no effort should be made to increase those difficulties, but with sweeping change in benefits and in the scope of the scheme this consideration can no longer hold.

The average insurance practitioner has lost a large proportion of his list to the Forces, and those in bombed areas to the country. In spite of this he must keep going a similar establishment at increased cost of both material and personnel, and he has now lost another percentage of his private work to the ranks of the insured. Added to this the voluntary services rendered in A.R.P. work—services which no one grudges but which must be taken into consideration by those who act for the profession—have reduced his available time. It would seem, therefore, that the time has come to call for an increase in the capitation fee. It has long been deserved, delayed too long, perhaps, owing to the representations of the ruling bodies, but has now reached the stage of a crying necessity.—I am, etc.,

W. LEES TEMPLETON.

Highgate, N.6, May 23.

State Medical Service

SIR,—The enthusiastic advocates of a State Medical Service appear to be direct spiritual descendants of Pygmalion, for they have fashioned an image with which they have fallen in love. How far their idealized creation would differ from the reality can easily be visualised by those who are familiar with the results of many approaches to the Minister of Health on such matters as an increase in the N.H.I. capitation fee. However reasonable the request has been, and however well supported by carefully accumulated evidence, it has always met with an arbitrary refusal. Why so many members of the profession long to place themselves under the completely autocratic control of a Government Department is a mystery to me, and, I believe, to many others. Are the principles of Fascism spreading so insidiously that they are causing us unconsciously to place one of the oldest and most honourable of all professions under a dictatorship? As to the alleged inevitability of a State Medical Service, surely some of your correspondents must be tinged with Oriental fatalism. There is nothing inevitable about it, if we do not want it and do not intend to have it. Lastly, it seems that after every war there is going to be a new heaven and a new earth, even according to those who appeared to find the old ones perfectly comfortable, but experience shows that when things have settled down again the old earth at any rate (for I cannot answer for heaven) appears to jog on in much the same fashion.—I am, etc.,

W. N. MAPLE.

Hove, March 24.

SIR,—I write as a general practitioner of twenty years' experience in a London suburb. In the last few years I have often asked myself and my fellow practitioners if the practice of medicine as it is to-day is really the best we can give our fellow creatures. I feel there is room for much reform from the point of view of both the general public and the doctor, so I venture to submit a scheme of State medicine which I hope may be considered practicable. There is a fact that we medical men must never forget—we are the servants of the public and they will have the last word in deciding whether they will have a State service or not.

My two main reasons for advocating a State service are: (1) The vast majority of the public who are not insured cannot afford to have a doctor, and I see no likelihood of such prosperity arising that this position will be altered. (2) The many reforms in the last twenty years that successive Governments have made in health benefits to the nation, admirable as their intentions have been, have resulted in a very complicated system, and in the whole of this period have eventually taken work away from the general practitioner, who is often spoken of as the backbone of the profession of medicine.

In my scheme there will be three main benefits: (1) It will benefit the nation as a whole in the matter of its health by enabling the doctor to educate the public in the prevention of disease. (2) The public will have the benefit of co-ordination of treatment free from financial worry, and at the same time free choice of their own doctor without feeling that every time they want him they have to put their hand in their pocket. (3) The doctor will benefit because he will be able to treat his patient in his consulting-room, in his own bed in his hospital, and in the patient's home. He will have adequate remuneration for his work and a pension at 65 to free him from financial worry in his later years. He will get sufficient annual holiday and a period for postgraduate study. Above all, he will be free to give all his skill to his patient without the failings of competitive medicine.

A scheme of State Medical Service must be divided into two parts (1) a general practitioner's or family doctor's service: (2) a consultant ervice. For my purposes a general census of the population would be necessary. To illustrate this scheme I am taking as an example an area containing 60,000 inhabitants. No doctor would have on his list more than 3,000 patients, so that in this area there would not be more than twenty doctors. Thus the patients who lived in this area would have their own choice of twenty names. In the centre of this area a health centre would be erected. This would be a one- or two-storied building and would contain twenty consulting and twenty waiting rooms. Each consulting and waiting room would be known as a particular doctor's "chair of health." There would be a central control room where all messages would be received from patients, and each doctor would have the assistance of a nurse and secretary combined. There would be a well-equipped casualty room where all minor injuries could be attended to; an *x*-ray department; a large pharmacy staffed by fully qualified pharmacists; a pathological laboratory and bacteriologist; and a board room where meetings would be held for the management of the centre, the board consisting of the doctors, members of the public, and representatives of the Ministry of Health. Attached to the health centre there would be a nursing centre of district nurses available to visit cases as required by the doctors. In addition to the health centre in this population of 60,000 people there would be a fully equipped hospital of 200 beds. Each doctor would be allotted ten beds which would be under his care. The hospital would have a staff of house-surgeons, who would be attached to each doctor, and the resident's duties would be in the hospital, with his doctor in the health centre, and visiting patients for his doctor in emergencies and in a night service.

Secondly, the consultant service. In each area—for example, North, South, East, and West London—and in each county there would be a fully equipped consultant team—that is to say, all branches of surgery and medicine would have at their service the greatest skill available. These consultants would have their specially fitted rooms in each hospital for their work, and would be called in by the doctors, who would be able to see their patients with the consultant. When a consultant was called the doctor would work under his direction assisted by the house-surgeon. No consultants would have private patients; they would all be higher paid State servants and would be pensioned accordingly. This, no doubt, would mean that some of the most eminent men in medicine would be making great financial sacrifices, but I think they are of such a calibre that between them they could foster a scheme that would be acceptable. Their duties would also include the teaching of students, and their services for this and the enormous amount of hospital work they now do unpaid should be adequately recognized by the State.

This State scheme does not include the large Public Health Service which now exists in such a satisfactory manner. Linking these services the Ministry of Health should have an advisory council composed of representatives of the Royal Colleges of Physicians and Surgeons, consultants, public health officers, family doctors, and pharmacists. This council would be of enormous value to the State, as each branch of the service would be equally represented.

The questions whether the present system of the employer paying for some of his employees' health should continue o whether it would be better to tax everyone by a health ta

in proportion to his income I do not propose to discuss, as I think State actuaries would be able to advise on them. As regards the salaries of doctors, there could be no such thing as compensation for practices; although doctors have paid large sums for these the State in return will be giving a guaranteed income and pension. House-surgeons would be paid £200 a year, would live in hospital and have full board, and would have the opportunity of studying for consultant service, or, after an interval, to be elected to an available "chair of health." Doctors elected to a "chair" would have a minimum salary of £750 a year, rising to the maximum of £1,500 according to their years of general practice, and would be pensioned accordingly. Consultants, again according to their years of consulting practice, would have a rising scale from £750 to £2,500 and pension accordingly.

In proposing such a scheme I feel there is something to think about, something to discuss together, always keeping in mind that we doctors and consultants are the servants of the public and how we can serve them best.—I am, etc.,

London, S.W.2, May 4. R. T. BAILEY.

SIR,—I note that the Minister of Health stated recently in the House that he "did not consider the present time opportune" to increase the capitation fee, and he later amplified this by pointing out difficulties which prevented taking into account the recent rise in the cost of living and the rise in practice expenses. One may well ask when will any Minister of Health ever consider the time opportune for increasing the capitation fee? In the past twenty years I am not aware that the time has ever been opportune, though when economies were needed to balance the Budget in 1931 that was an opportune time for bringing about a temporary decrease. If the nation cannot spare a few hundred thousand a year extra for panel practice at a time when it is spending a million every two hours on the war, it is obvious that the time will never be opportune in the eyes of the Ministry until faced with the 100% resignation of all panel practitioners as an alternative. Until such time as our representatives are prepared to take drastic action we shall get nowhere.

This is the treatment accorded to panel practitioners by Ministers of Health of all parties, yet there are actually practitioners who advocate a State Medical Service, and who would entrust the whole of their practices to the Ministry. It is obvious that any such scheme would be suicidal. In a very short time the status of medical practitioners would be reduced to that of the elementary school teacher. The salary would start at £250 with a maximum of about £750.

This question of status seems to have been very largely ignored. At present it is usual for a doctor to live in one of the best houses in his neighbourhood, to drive a respectable car, to send his children to public schools, and otherwise to enjoy a fairly high social status. All this requires a reasonably good income, and it is the exception for a salaried medical officer employed by the public health authorities to be as well off in this respect as his G.P. colleagues. Now this "status" is one of the G.P.'s assets: the expenses of his prominent house are recognized by the tax authorities as being necessarily incurred in maintaining the goodwill of his practice. But would such a "status" be necessary to a medical officer in a State service? There would be no goodwill to be kept up; it would not matter to the public health committee whether their medical officers turned up at the clinic in their own cars or on the municipal tram, and a municipal house would be quite adequate for them. Such considerations would be weighed up in determining what was an adequate salary, as would the fact that there would be a month's holiday with pay, a pension at 65, and other apparent attractions. The result of this loss of status would ultimately be that medicine would cease to offer the attractions of other professions such as the Law, and it would gradually pass into the hands of quite a different class of the community.—I am, etc.,

Coventry, May 17. D. MURRAY BLADON.

SIR,—With reference to Dr. B. Spearman's letter (*Supplement*, May 24, p. 70), I think that few members of the old West African Medical Staff, who formed by far the largest body of medical men employed in the Colonial Medical Service, would agree with his statement that the emoluments of the service have increased by 50%. On the contrary, their total pay and allowances have decreased, apart from the loss of valuable sources of income from private practice.

I will not enter here into the question of their loss of status and prestige, but will merely assert that it was in opposition to the wishes of the majority of the West African Medical Staff that they were absorbed into a unified Colonial Medical Service.

I enclose my card and am, etc.,

May 26. EX-W.A.M.S.

Medical Services of H.M. Forces

Appointments

ROYAL NAVY

Surgeon Lieut.-Commander A. J. Glazebrook has been placed on the Retired List.

Acting Surgeon Lieut.-Commander J. Carlton to be Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Lieut. P. S. Ludman to be Surgeon Lieutenant-Commander.

Probationary Surgeon Lieut. G. F. Adams to be Surgeon Lieutenant.

Probationary Temporary Surgeon Lieuts. T. B. Whitehead, J. Mackenzie, G. T. Allen, H. J. Bradshaw, W. A. Fyfe, L. N. Lennox, C. J. Vaughan, R. C. R. Gothen, P. L. Nicolle, V. H. Allan, R. V. Blaubaum, R. Kershaw, E. B. Riding, N. Marks, and P. R. Day to be Temporary Surgeon Lieutenants.

ARMY

Colonel (temporary Brigadier) W. H. O'Riordan, M.C., late R.A.M.C., has retired and remains employed.

ROYAL ARMY MEDICAL CORPS

Lieut.-Colonels A. C. Elliott, retired pay, W. Davis, retired pay, and A. T. Frost, O.B.E., retired pay, have reverted to the rank of Major, at their own request, whilst employed during the present emergency.

Major G. D. Jameson has been restored to the rank of Lieutenant-Colonel on reversion to retired pay.

Captain (temporary Major) R. C. Langford to be Major.

Short Service Commission.—Captain C. W. A. Hughes to take rank and precedence in his Corps and in the Army as if his appointment as Captain bore date March 31, 1941.

Short Service Commission.—Captain C. E. Watson has been placed on the half-pay list, and has retired on account ill-health

Postgraduate News

The Fellowship of Medicine announces the following courses for Final F.R.C.S. candidates: (1) Clinical demonstrations, 2 p.m., Wednesdays, July 2 to 23; (2) Revision course, daily 10 a.m., July 7 to August 1; (3) Practical Operative Surgery, Mondays, Thursdays, and Fridays, 2 p.m., July 7 to August 1; (4) Urology Course, Thursdays, 2.30 p.m., August 7 to 28.

A second wo[illegible] medical services for medical practitioners, arran[illegible] anchester in collaboration with the Association of [illegible] will be held in the medical school of the universit[illegible] June 28 and 29. The fee for the course is £1 [illegible] may be had from the director of extramural stu[illegible] ester, 13.

WEEKLY POSTGRADUATE DIARY

B[illegible] ie Road, W.—Daily, 10 a.m., Operations, Obstetrical and [illegible] 1.30 p.m., Post-mortem [illegible]e, Dr. R. Lightwood, Wed., [illegible]edical). Thurs., 2 p.m., [illegible] ration, [illegible] (Surgical), 5 p.m.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.—Royal Chest Hospital, City Road, E.C., Weds., 3.30 p.m. *M.R.C.P. course in Heart Diseases.*

DIARY OF SOCIETIES AND LECTURES

ROYAL SOCIETY OF MEDICINE

Section of Neurology.—Thurs., 5 p.m. Annual general meeting. Paper by Squadron Leader Denis Williams: Electro-encephalography in Trauma to the Brain.

Section of Physical Medicine.—Fri., 4.30 p.m. Annual general meeting. Paper by Dr. P. Bauwens: Thermionic Control of Electric Currents in Electromedical Work.

Section of Ophthalmology.—Fri., 5 p.m. Annual general meeting. Paper by Mr. T. M. Tyrrell: Some Notes on Treatment of War Injuries of the Eyes.

DAVYHULME MILITARY HOSPITAL MEDICAL SOCIETY.—Thurs., 3 p.m., Major Higham, R.A.M.C.: Head Injuries. Medical men and women in any of the Services, including civilian, will be welcomed.

PADDINGTON MEDICAL SOCIETY.—At St. Mary's Hospital, W., Tues., 8.45 p.m. Annual General Meeting, Election of Officers, etc. Dr. G. de Swiet: The Place of the Doctor in the Community of To-morrow.

VACANCIES

EXAMINING FACTORY SURGEON.—The appointment at Eastbourne (Sussex) is vacant. Applications to the Chief Inspector of Factories, 28, Broadway, S.W.1, by June 17.

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

MARRIAGE

BENHAM—KILNER.—On May 28, 1941, at Heyworth, near Huddersfield, George Herbert Harry Benham, M.B., M.R.C.P., to Ena May Kilner, S.R.N.

DEATH

WHITEACRE.—On May 6, 1941, R. D. Whiteacre, M.B., B.Ch. (Dublin), of 262, Devonshire Avenue, Southsea.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 21 1941

SOME PROBLEMS OF MINIATURE MASS RADIOGRAPHY

BY

J. V. SPARKS, M.R.C.S., L.R.C.P., D.M.R.E.

Assistant Medical Officer, X-ray Department, St. Bartholomew's Hospital; Assistant Director, X-ray Department, Brompton Hospital for Consumption

The advent of war found us unprepared not only from the point of view of military equipment but also in the seemingly insignificant means of undertaking mass radiography by the miniature method. Though the results of such methods trickled unceasingly into this country from South America, Germany, and Holland for some years before the war, not until hostilities had started was it appreciated that the method was likely to prove of the greatest value in preventing the enrolment of tuberculous subjects in the Services and in industry. It is idle to complain that we missed the opportunity of importing the necessary type of apparatus, which had carried out many thousands of such examinations in enemy and enemy-occupied territory. Let us rather take consolation in the fact that our own manufacturers have now overcome great difficulties in designing and perfecting apparatus suitable for this work.

The Royal Navy has published the results of the first 18,000 men examined by this means, and it is to be hoped the opportunity will now be taken of establishing this new method in other Services and in industry; for as the war progresses it will become of increasing importance, and without organization the demand will not be met.

While it is true that any *x*-ray plant, fluoroscopic screen, and suitable camera attachment will take a miniature radiograph, there is a vast difference between such a procedure and mass radiography by the miniature method. It must be emphasized that a special apparatus is required for mass radiography, as the machine must be capable of examining cases at the rate of 200 an hour, perhaps even of 1,500 daily. The importance of such speed was emphasized by Rear-Admiral Dudley in his report. There is no doubt that these numbers throw a great strain on the personnel and on the tube, yet this problem is such that machine design must be in alignment with all possible eventualities.

Application of Mass Radiography in War

Though from the surveys carried out by observers abroad useful information can be gleaned on the technical side, the problems to be faced in any attempt to undertake mass radiography by the miniature method in this country differ because of the larger population distributed in a larger number of independent big towns situated in close proximity to each other. The "calling up" for registration purposes, for example, might entail the *x*-ray examination of 500,000 persons within a period of twelve hours, and if each machine examined 2,000 men 250 machines would be required. The cost of these machines, even if they were available, would represent a capital outlay of £250,000 and would cover only a small fraction of the centres where registration takes place. Even if a plant were erected in each county the cost of travelling to it might far exceed the cost of the usual routine film.

The provision of facilities for carrying out miniature radiography in conjunction with the routine medical examination would also involve a large capital outlay—in the neighbourhood of £150,000—and would have the additional disadvantages of limiting the number of men examined daily and of failing to provide the necessary information at the time the medical examination was made. The examination of the young adult females who have recently registered—a most important group of persons especially prone to infection—would have supplied data of great value.

It certainly seems unlikely that any organization for dealing with such large numbers can be developed at the present time. Alternatively there are considerable possibilities of carrying out a smaller scheme that would include the sections of the fighting Services likely to be subjected to the greatest strain. By this method all men would be examined before proceeding for service abroad, and all cadets to be trained for special duties would have the benefit of this additional examination. The advantages to be gained might well be applied to this latter group immediately, using the routine examination until such time as the miniature method is available.

Application of Mass Radiography in Peacetime

It is likely that miniature radiography will play an important part in the routine medical examinations of the community after the war. There is no reason to doubt that the increased incidence of tuberculous disease that became evident after the last war may again become manifest, especially in view of the additional factor of the conditions brought about by aerial warfare. First, facilities can be provided for the examination of all men called up for military service at the age of 20, and there will be no reason why each man should not be re-examined before his discharge. These examinations will supply important information as to the incidence of chest disease in the male population at that age, and the radiographs will provide an invaluable record of the state of the lungs at that time—a record which could be referred to at will by any hospital or medical attendant should the person subsequently develop a chest complaint. Such examinations would depend on the maintenance of conscription after the war.

In civil life in this country the problem would present greater difficulties than those encountered in an undemocratic constitution. It is obvious that such methods would have to be organized and developed on voluntary lines by individual concerns. That this will be done on an increasing scale is not doubted, as it will benefit the health of the employees and be of financial interest to the employer.

Messrs. Phillips and Co. of Einthoven have in the last seven years completed an examination of 100,000 employees and their relatives; during this period the

number of days sick leave occurring annually in their company as a direct result of tuberculosis has diminished by no less than 71%, and for an expenditure of 88,000 guilders 252,000 guilders had been saved in expenses for sick pay, medical treatment, treatment in sanatoria, and pensions. The examinations have been carried out voluntarily, as they would be in this country, and were extended to include the members of the household of any of the staff, being repeated at intervals of eighteen months. No charge is made for the service.

There is little doubt that a Government Department or industrial concern might have difficulty in persuading all its employees to consent to such an examination, which might have a far-reaching effect on their employment, and some of the more suspect individuals might reasonably avoid being examined. Many months would necessarily elapse before such a scheme could become universal. A start, however, could be made by insisting that all prospective immigrants entering the country were examined; similarly, this regulation might be applied to all new applicants for the Civil Service, including post-office workers, policemen, and school-teachers. All persons returning to duty following a period of sick leave should necessarily be included. In industrial firms the examination of all new employees should be insisted on, with the result that in a few years, with periodic examinations, the incidence of tuberculosis would undoubtedly show a steady fall. This new form of *x*-ray examination would be of especial benefit to the employers in industries in which a "dust hazard" exists, as by this means any fresh applicant for employment would have his chest record made and the employer would refrain from signing on any man whose lungs showed signs of damage from previous employment. Also, in assessing individuals for life insurance many errors could by this means be avoided.

Through the kind co-operation of Messrs. Stanley Cox, Ltd., we were able to take a small series of miniature radiographs of patients attending the out-patient department of Brompton Hospital in the few days previous to the delivery of the plant to the Services. It was hoped that during this period we should be able not only to compare the miniature film with the routine radiograph but to come to some conclusions as to the type of lesions which might fail to be visualized by the former method. It is unfortunate that during the few days the apparatus was available hardly any of the patients with minimal shadows attended for their periodic routine radiograph, but some idea of the accuracy of the visualization of small areas of infiltration can be gauged from a study of the opposite lung in the cases under treatment by artificial pneumothorax (see Table).

Type of Apparatus Employed

The type of plant was essentially the duplicate of the machine used by the Royal Navy, as reported by Rear-Admiral Dudley and Commander Fitzpatrick (1941). It is fitted with a 10 kW shock-proof tube, the cooling fan of which comes into operation when the temperature rises above a certain critical temperature. The focal screen distance is 86 cm., and the screen - camera distance 76 cm. The special features include an electrically operated camera which brings the new film into position, and automatic illumination to indicate that the device by which the patient's name is photographed on the film has been effective. The latest type of Kodak film was used throughout for these examinations, and no test of speed was attempted. It was, however, obvious that owing to the neat design of the plant patients could be photographed at the rate of 4 a minute, and that it took longer to record the particulars of the patient's name and number than to carry out the radiographic procedure.

Consideration of Technique

In this country mass radiography is only at its beginning, and the few plants in operation are not yet working to capacity. The plant as supplied to the Royal Navy has on occasions achieved 220 examinations an hour.

Observers abroad give full details of their technique and the numbers examined, but provide little information of the time period over which the examinations were carried out and no details of tube life under such circumstances. This latter is of considerable importance in estimating the cost of mass examinations. There are few constant factors in the technique of other workers. In only one instance was a 6 kW tube used. Other workers have employed the 10 kW tube or the rotating anode type. The 10 kW tube used by the Royal Navy has taken 220 photographs in an hour, and it is thought unlikely that the rotating anode tube would be capable of standing up to this speed for long periods. The tube - screen distance is in all cases small in order to minimize exposure time.

The use of a stationary grid is said to improve contrast; but here, again, the grid doubles the exposure time and throws an increased strain on the tube. Nevertheless, the time of exposure is already greatly in excess of that in common use for routine radiography, being for the small patient 0.3 second without a grid. It is to be hoped that the research into the speed of the miniature film will bring about still further improvement in the time factor. Experiments into the optimum combination of screen and film have recently been reported by Stanford (1941).

Miniature radiography will naturally fail primarily in those cases in which routine radiography produces a less efficient result, notably in the large or muscular patient. In this respect Commander Fitzpatrick is to be congratulated on the uniformity of his results. It will also fail in those cases in which fluoroscopy is essential to complete the diagnosis. These cases form only a small percentage of the whole. To what extent miniature radiography will demonstrate the soft minimal lesions of tuberculous disease and the reticular shadows associated with bronchiectasis and other disease should form useful material for investigation, in conjunction with the routine film, in a chest hospital. As against this small percentage of failures, the method will bring under observation the large majority of persons with abnormal shadows in the lungs—persons who may have either indefinite physical signs or complete absence of them.

There is no question of this method acting as a substitute for normal radiography; rather should it be considered an additional means of bringing under investigation a number of symptomless persons who may subsequently be found to have abnormalities in the chest. Errors of commission will be eliminated by routine radiography and medical examination.

Viewing of Films

The problem of viewing miniature films is an important one, quite apart from their interpretation, and it is probable that they should be subdivided into three main groups—normal, abnormal, and inadequate for interpretation. The second and third groups may be found to represent about 5% of the total. A difficulty will be found in the eye-strain involved in reporting. The miniature film when projected does not form so distinct an image as the routine film, and the detail does not improve on close inspection. Though the results can be viewed at leisure one finds that after reporting 100 films in an hour a definite eye fatigue sets in. No such fatigue was noticed after viewing the same full-sized films the next day.

The comparative reports of the miniature and full-sized films (see Table) are appended without comment, as it is realized they are limited in number and not representative of the type which would be encountered in any mass survey.

Table showing Comparative Reports of Miniature and Full-sized Films

6 N = Normal.
112 ABN = Abnormal.
1 I = Indeterminate.
1 X = Errors of commission which would be corrected by routine radiography.
5 Y = Errors of omission.
22 O = Cases in which miniature radiograph suggested an abnormality without revealing all the abnormal shadows or their exact nature.

Case No.	Sex	Miniature Film	Full-sized Film
1 O ABN	M	R. Cavity middle zone L. Doubtful base	R. Consolidation in middle and lower zones, with cavity in middle zone L. Accentuation of striation in lower zone
2 AEN	F	R. Pneumothorax L. Normal	R. Same L. "
3 AEN	F	R. Pneumothorax L. Normal	R. " L. "
4 Y ABN	F	R. Pneumothorax L. Normal	Bilateral pneumothorax
5 ABN	F	R. " L. "	R. Same L. "
6 N	F	R. " L. "	R. " L. "
7 N	F	R. " L. "	R. " L. "
8 AEN	M	R. Lesion, 2nd interspace L. Lesion lower zone	L. Consolidation left base R. Pleural thickening in lower zone
9 AEN	M	R. Opacity at base L. Normal	L. Same R. "
10 ABN	M	R. Pneumothorax L. Normal	L. " R. "
11 AEN	M	R. Infiltration upper and middle zones L. Pneumothorax with fluid level	L. "
12 AEN	M	Poor film R. 1st interspace doubtful L. Pneumothorax with fluid level	R. " L. " Bilateral pneumothorax
13 ABN	M	R. Pneumothorax L. Doubtful pneumothorax	R. Same L. Fibrosis at apex and in 1st and 2nd interspaces
14 AEN	M	R. Pneumothorax L. Abnormal shadows upper and middle zones	R. Same L. "
15 AEN	M	R. Apical scarring L. Pneumothorax with fluid level	R. " L. "
16 ABN	M	R. Apical scarring L. Pneumothorax	R. " L. "
17 ABN	M	R. Normal" R. Infiltration upper and middle zones	R. Infiltration upper and middle zones. Calcified deposits middle and lower zones L. Same
18 O ABN	M	L. Pneumothorax Bilateral pneumothorax	Same R. Thin-walled cavity middle zone containing fluid level ? Cyst
19 ABN	M	R. Lesion in middle zone	L. Same
20 ABN	F	L. Normal R. Pneumothorax	R. " L. "
21 ABN	F	L. Normal R. Pneumothorax	L. Pleural involvement at base
22 ABN	F	L. Doubtful costophrenic angle	R. Same
23 AEN	F	R. Infiltration in upper zone L. Pneumothorax	L. " R. Normal
24 I ABN	F	R. Indeterminate L. Pneumothorax	L. Same R. "
25 ABN	F	R. Normal L. Pneumothorax	L. " R. Consolidation middle and lower zones. ? bronchial dilatation
26 ABN	F	Bilateral abnormal shadows	L. Consolidation middle and lower zones, with pleural involvement R. Apical scarring
27 ABN	F	R. Doubtful apex L. Pneumothorax with fluid level	L. Same R. "
28 AEN	F	R. Pneumothorax with fluid level L. Infiltration upper and middle zones	L. "
29 ABN	F	R. Normal L. Pneumothorax with fluid level	R. " L. "
30 ABN	F	R. Normal L. Pleural involvement at base. Bifid 3rd rib	R. " L. Localized infiltration at apex and in 1st and 2nd interspaces
31 O ABN	F	R. Pneumothorax L. Apical scarring	Same
32 ABN	F	Bilatera pneumothorax " "	R. Same L. "
33 ABN	F	R. Pneumothorax L. Cavity in middle zone	R. " L. Normal
34 ABN	F	R. Pneumothorax L. Base doubtful	R. Same L. "
35 O AEN	F	R. Normal L. Pneumothorax	R. " L. Scarring at apex and in 1st and 2nd interspaces
36 ABN	F	R. " L. Lesion in 1st and 3rd interspaces	
37 O ABN	F		

Table showing Comparative Reports—continued

Case No.	Sex	Miniature Film	Full-sized Film
38 O ABN	F	R. Lesion at apex and ? 2nd interspace L. Pneumothorax	R. Lesion at apex and in 2nd and 3rd interspaces L. Same
39 ABN	F	Bilateral pneumothorax " "	Same "
40 ABN	F	" "	R. Same
41 ABN	F	R. Pneumothorax L. Lesion at apex and 1st interspace	L. Infiltration at apex and 1st interspace
42 ABN	F	R. Pneumothorax L. Normal	R. Same L. "
43 ABN	F	Poor film R. Normal	R. Scarring at apex L. Same
44 Y ABN	F	L. Pneumothorax R. Infiltration upper and middle zones	R. " L. Infiltration at apex and in 1st and 2nd interspaces, with calcifying scar towards lower zone
45 ABN	F	L. Lesion in upper zone	R. Same L. Infiltration in upper and middle zones, with apical cavity
46 O ABN	M	R. Pneumothorax with fluid level L. Apical cavitation	R. Apical scarring L. Same
47 AEN	F	R. Doubtful right apex L. Normal	R. " L. Bifid 8th rib, simulating pneumothorax
48 O ABN	M	R. Emphysema L. ? Basal pneumothorax	R. Consolidation in lower zone medially L. Consolidation in lower zone
49 ABN	M	R. Lesion at base L. " "	R. Bulla simulating pneumothorax L. Apical bulla and scarring in 3rd interspace
50 O ABN	M	R. Pneumothorax in upper zone L. Scarring in 3rd interspace	R. Same L. " R. "
51 N	M	R. Normal L. "	L. Infiltration in upper zone and pleural involvement at base
52 AEN	M	R. " L. Apical lesion and pleural involvement at base	R. Same L. " R. "
53 N	M	R. Normal L. "	L. " R. "
54 N	M	R. " L. "	L. "
55 ABN	M	R. Pneumothorax with fluid level L. Normal	R. " L. "
56 AEN	M	R. Pneumothorax L. Scarring in 1st interspace	R. " L. "
57 ABN	M	R. " L. Pneumothorax with fluid level	R. " L. "
58 ABN	M	R. Pneumothorax L. Normal	R. " L. Scarring at apex and in 1st interspace
59 ABN	F	R. Pneumothorax L. Doubtful 1st interspace	R. Same L. "
60 AEN	M	R. Pneumothorax L. Old pneumothorax	R. " L. "
61 AEN	M	R. Normal L. Pneumothorax	L. Pneumothorax
62 O ABN	M	R. Lesion in upper zone and pleural involvement L. Localized lesion in 1st and 2nd interspaces	L. Lesion at apex and in 1st and 2nd interspaces R. Same
63 O ABN	M	R. Pneumothorax with fluid level L. Lesion 1st interspace	L. Lesion in 1st and 2nd interspaces R. Infiltration in 1st to 3rd interspaces. Bifid 4th rib
64 O ABN	M	R. Doubtful apex and 1st interspace L. Pneumothorax with fluid level	L. Same R. "
65 ABN	M	R. Pneumothorax L. Normal	L. " R. "
66 ABN	M	R. Pneumothorax with fluid level L. Normal	L. " R. "
67 ABN	M	R. Pneumothorax with fluid level L. Normal	L. " R. Infiltration in lower zone
68 ABN	M	R. Lesion lower zone L. Pneumothorax	L. Same R. " L. Normal
69 X ABN	M	L. Lesion in 1st and 2nd interspaces R. Infiltration upper and middle zones	R. Infiltration in upper and middle zones, with pneumothorax L. Apical scar
70 O ABN	M	L. Lesion 1st interspace R. Lesion upper and middle zones	R. Infiltration upper and middle zones L. Same
71 ABN	M	L. Pneumothorax R. Normal	R. " L. "
72 N	M	L. " R. Apical scar	R. Scarring at apex and 1st interspace L. Same
73 O ABN	M	L. Pneumothorax R. Doubtful apex	R. Apical scarring L. Same
74 ABN	F	L. Pneumothorax R. Encysted effusion	R. " L. "
75 O AEN	F	L. Normal	Vertebral abscess

Table showing Comparative Reports—concluded

Case No	Sex	Miniature Film	Full-sized Film
76 ALN	F	R. Infiltration upper and middle zones	R. Same
		L. Pneumothorax	L. Pneumothorax with apical cavity
77 ALN	F	R. Lesion 5th interspace	R. Same
		L. Pneumothorax	L. "
78 ABN	F	R. "	R. "
		L. Doubtful 1st interspace	L. "
79 ABN	M	R. Normal	R. "
		L. Pneumothorax	L. "
80 ABN	F	R. Normal	R. "
		L. Pneumothorax	L. "
81 ABN	M	R. Apical pneumothorax	R. "
		L. Normal	L. "
82 ABN	M	R. Infiltration upper and middle zones	R. Fibrosis and infiltration upper and middle zones
		L. Normal	L. Same
83 Y ABN	F	R. "	R. "
		L. "	L. Calcified scar at apex overlying rib
84 ABN	M	R. Rib resection	R. Same
		L. Normal	L. "
85 ABN	M	R. "	R. "
		L. Pneumothorax	L. "
86 ABN	M	R. Normal	R. "
		L. Pneumothorax	L. "
87 ABN	M	R. Normal	R. "
		L. Pneumothorax	L. "
88 ABN	M	R. "	R. "
		L. Normal	L. "
89 ABN	M	R. Pneumothorax	R. "
		L. Normal	L. "
90 ABN	M	R. Infiltration upper and middle zones	R. Infiltration upper and middle zones, with cavities below clavicle
		L. Pneumothorax	L. Same
91 ABN	M	R. Normal	R. "
		L. Pneumothorax	L. "
92 ABN	M	R. "	R. "
		L. Normal	L. "
93 ABN	M	R. Doubtful 2nd interspace	R. Lesion in 2nd interspace
		L. Pneumothorax	L. Same
94 O ABN	M	R. Apical scar, 2nd interspace doubtful	R. Infiltration upper and middle zones
		L. Pneumothorax	L. Same
95 ABN	M	Bilateral pneumothorax	Same
96 ABN	M	R. Old pneumothorax	R. Same
		L. Pneumothorax	L. "
97 ABN	M	R. Pneumothorax with fluid level	R. "
		L. Normal	L. "
98 ABN	M	Bilateral pneumothorax	Same
99 O ABN	F	R. Pneumothorax with fluid level	R. Same
		L. Lesion in 2nd and 3rd interspaces	L. Lesion in 1st and 2nd interspaces
100 ABN	F	R. Normal	R. Same
		L. Pneumothorax with fluid level	L. "
101 ABN	M	Bilateral pneumothorax	Same
102 ABN	M	R. Pneumothorax	R. Same
		L. Normal	L. "
103 O ABN	M	R. Pneumothorax	R. "
		L. 2nd interspace doubtful	L. Apical scarring
104 O ABN	M	R. Pleural involvement middle zone. Lesion 3rd interspace	R. Apical scarring, pleural involvement middle zone
		L. Normal	L. Same
105 ABN	M	R. Pneumothorax with fluid level	R. "
		L. Normal	L. "
106 ABN	M	Bilateral pneumothorax	Same
107 ABN	M	"	"
108 O ABN	M	R. Doubtful scar at apex	R. Lobe of azygos vein is present
		L. Infiltration in upper and middle zones	L. Same
109 ABN	M	R. Pneumothorax	R. "
		L. Normal	L. "
110 ABN	M	R. Thoracoplasty	R. "
		L. Pneumothorax	L. "
111 ABN	M	R. Normal	R. "
		L. Pneumothorax	L. "
112 ABN	M	R. "	R. "
		L. Normal	L. "
113 ABN	M	R. "	R. "
		L. Pneumothorax	L. "
114 O ABN	M	R. Doubtful 2nd interspace	R. Scarring in 1st and 2nd interspaces
		L. Pneumothorax	L. Same
115 O ABN	M	R. "	R. "
		L. Calcification in hilum	L. Normal. Vascular shadows in hilum
116 Y ABN	M	R. Pneumothorax	R. Same
		L. Normal	L. Scarring in 1st interspace
117 ABN	M	Bilateral pneumothorax	Same
118 Y ABN	M	R. Pneumothorax	R. Same
		L. Normal	L. Scarring at apex and 1st interspace

It is emphasized that the miniature films are less easy to interpret and that the sharpness of detail was not at all comparable to that obtained by the condenser set using a rotating anode tube and an exposure of one-thirtieth of a second. The image was, in fact, reminiscent of that procurable in a chest radiograph of about twenty years ago. However, as can be seen, it sufficed in a large majority of cases to give the necessary indication of the desirability of carrying out a further examination.

Protection.—It seems likely that it will be necessary to carry out tests with regard to the protection of the persons who are constantly working these machines, as the number of daily exposures may be greatly in excess of those made annually in *x*-ray departments.

Summary

Miniature radiography may be regarded as an additional means of bringing under investigation symptomless persons who may subsequently be found to have chest abnormalities.

A comparison is made of a small number of miniature radiographs with the corresponding full-sized films.

Attention is drawn to the importance of developing miniature radiography at the present time. It is considered likely that after the war miniature radiography will play an important part in routine medical examination of the community.

Some of the difficulties that may be encountered are discussed.

I should like to thank Messrs. Stanley Cox and Co., Ltd., for the loan of their plant, and the medical committee of the Brompton Hospital for their permission to install it; also Dr. R. L. Rawlinson for his helpful co-operation.

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TUBERCULOSIS IN RECRUITS

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The increase of tuberculosis among the civilian population of the countries of Europe and the high incidence of that disease in the Services during and after the last war have been well recognized. Tuberculosis in the Services cost the British Empire a very large sum of money in pensions and treatment allowances, but the amount of infection spread by tuberculous men passed as fit and by others with latent disease who developed active tuberculosis owing to the strain of military duties cannot be measured.

The Welsh National Memorial Association, which is responsible on behalf of the counties and county boroughs of Wales for the diagnosis and treatment of tuberculosis, offered early in the present war to examine and radiograph, free of charge, all men called up for military service in the counties of Anglesey and Carnarvon, which were chosen because they have a high incidence and a high death rate from the disease. The question was later taken up with the Ministry of Labour and National Service; but unfortunately, for various reasons, satisfactory arrangements could not be made in time to include the younger age groups—i.e., the under 30's—the important categories from the point of view of tuberculosis, and the project was therefore abandoned.

The committee, under the chairmanship of Lord Horder, which the Minister of Labour appointed to advise him on problems arising from the examination of recruits by civilian medical boards, reported that:

> "They had in particular explored the possibility of examining the chests of all recruits radiologically. The only way in which this could be done would, they said, be by miniature radiography, but although the adoption of this

method was the ideal to be aimed at serious practical difficulties arose . . . and it was considered impracticable at the present time."—(*Lancet*, 1940, 1, 28.)

The Tuberculosis Regulations, 1940, were, however, a result of the Horder Committee's recommendations. As applied to Wales, these regulations make it obligatory on medical officers of health of all sanitary authorities to give particulars in respect of notified male cases of tuberculosis of certain ages, and on tuberculosis officers to give particulars of all treatment in such cases, to the Ministry of Labour and National Service.

General Notes on the Investigation

The activities of the Welsh National Memorial Association cover a population of 2½ millions. A uniform system of case-taking and record-keeping is in use at all the clinics of that association. The numerous opportunities enjoyed by the medical staff for a frequent interchange of views through attendance at various institutions and at medical staff meetings have enabled a fairly uniform standard of diagnosis to be attained. As the available figures were fairly large and the data upon which they were based reasonably comparable, it was decided to investigate the incidence of tuberculosis in recruits referred by medical boards since the passing of the Military Training Act in May, 1939, up to December 31, 1940—paying particular attention to the reasons for reference. Careful histories were taken of all men referred; they were clinically examined; full-size (15 by 12 inch) radiographs were taken in each case, and the sputum was examined whenever available.

Numbers Investigated

The total number of cases referred by medical boards during the period under consideration amounted to 3,049, of which 1,180 had been previously examined by the tuberculosis officers and 1,869 were seen for the first time when referred by the medical board. These two groups have been kept separate, and Table I gives particulars of the "old cases" according to their condition at the time of reference to the tuberculosis officers by the medical boards.

TABLE I.—*Results of Investigation of Recruits previously known to the Tuberculosis Service*

Age Groups	Found to be Tuberculous							Observation	Non-tuberculous	Total
	Active			Quiescent	Arrested	Recovered	Total			
	Pulmonary		Non-pulmonary							
	T.B.+	T.B.−								
18-20	1	—	2	1	—	6	10	1	21	32
20-25	32	30	7	60	38	70	237	5	249	491
25-30	41	23	8	44	44	93	253	1	150	404
30-35	31	8	6	33	18	60	156	2	95	253
Totals	105	61	23	138	100	229	656	9	515	1,180

It will be seen that of the 1,180 old cases 656 had at some time previously been found to be suffering from tuberculosis; in 166 pulmonary cases the lesion was still active (105 of these had a positive sputum). There were 23 non-pulmonary active cases. Of these 656 old cases 238 (36.3%) were found, when referred by the medical boards, to have improved sufficiently to be classified as "quiescent" or "arrested," and a further 229 (34.9%) were regarded as recovered—a total of 467, or 71.2%. 515 of the 1,180 were old patients who had previously been found non-tuberculous but were referred by the medical boards to the tuberculosis officers in most cases because they said they had attended a tuberculosis clinic at some time or other.

Reason for Reference

A main object of the investigation was to learn why the medical boards had referred the 1,869 new cases to the tuberculosis officers. For this purpose they have been classified in Table II under four main headings—namely:

1. Contact History:
   (*a*) *Intimate.*—Household contact or prolonged contact to infection in the place of employment, etc.
   (*b*) *Casual.*—Contact with cases of tuberculosis of a more temporary nature.
2. Significant Past Personal History:
   Pleurisy, spontaneous pneumothorax, and haemoptysis.
3. Present History:
   (*a*) *Significant.*—Cough, especially of recent onset, sputum, haemoptysis of at least 1 drachm, pain in the chest, frequent colds, unwonted lassitude, progressive loss of weight, night sweats, etc.
   (*b*) *Non-significant.*—Bronchitis and asthma of long duration (considered non-significant in age group under consideration), and a variety of other symptoms.
4. Physical Signs:
   Abnormal signs in the chest and/or poor general condition, rapid pulse, etc.

TABLE II.—*Reason for Reference of Recruits not previously known to the Tuberculosis Service*

Reason	Age Group				Total
	18-20	20-25	25-30	30-35	
1. *Contact history:*					
(a) Intimate	20	176	130	172	498
(b) Casual	2	39	28	27	96
2. Significant past personal history	8	136	128	131	403
3. Present history:					
(a) Significant	8	129	89	76	302
(b) Non-significant	7	154	87	106	354
4. Physical signs	14	95	62	45	216
Totals	59	729	524	557	1,869

Of the total number of new cases, 498 (27%) were referred on account of intimate contact history; 96 (5%) on account of a casual contact history; 403 (21%) for their significant past personal history; 656 (35%) on their present history; and 216 (12%) because of physical signs.

Tables IIIa, IIIb, IIIc, and IIId show the results of examinations carried out by the tuberculosis officers under the four main categories of the reasons for reference.

Contact History

TABLE IIIa.—*Results of Investigation of Recruits Referred on Account of Contact History*

Age Groups	Tuberculous			Observation	Non-tuberculous	Total
	Pulmonary		Non-pulmonary			
	T.B. +	T.B. −				
18-20	—	—	—	—	22	22
20-25	1	9	—	2	203	215
25-30	1	11	—	3	143	158
30-35	3	8	—	4	184	199
Totals	5	28	—	9	552	594

No case of tuberculosis was found among the 96 men referred on account of a casual contact history. Of the 498 referred because of an intimate contact history, 33 (6.6%) were found to be suffering from pulmonary tuberculosis, and 9 others were considered to have signs and

symptoms suggestive enough of tuberculosis to warrant their being kept under further observation. In the 20-25 age group 10 cases out of a total of 215 referred (4.6%), in the 25-30 group 12 out of 158 (7.6%), and in the 30-35 group 11 out of 199 (5.5%) were found to be tuberculous.

Significant Past Personal History

TABLE IIIb.—*Results of Investigation of Recruits Referred on Account of Significant Past Personal History*

Age Groups	Tuberculous			Observation	Non-tuberculous	Total
	Pulmonary		Non-pulmonary			
	T.B. +	T.B. −				
18-20	—	—	—	—	8	8
20-25	2	5	—	2	127	136
25-30	3	5	1	4	115	128
30-35	1	5	—	2	123	131
Totals	6	15	1	8	373	403

Table IIIb shows the results of the examination of those men referred on account of a significant past personal history: out of a total of 403, 22 (5.4%) were found to be tuberculous and 8 others required further observation. In the 20-25 age groups 7 out of 136 (5.1%), in the 25-30 group 9 out of 128 (7.2%), and in the 30-35 group 6 out of 131 (4.6%) were tuberculous.

Present History

TABLE IIIc.—*Results of Investigation of Recruits Referred on Account of Present History*

Age Groups	Tuberculous			Observation	Non-tuberculous	Total
	Pulmonary		Non-pulmonary			
	T.B. +	T.B. −				
18-20	1	3	—	—	11	15
20-25	6	8	—	4	265	283
25-30	2	12	—	2	160	176
30-35	5	—	—	1	168	182
Totals	14	31	—	7	604	656

Table IIIc gives the results of the examination of recruits referred on account of "present history." Out of 656 men 45 (6.8%) were found to be suffering from pulmonary tuberculosis and 7 required further observation. In the 18-20 age group 15 cases only were referred, and of these 4 were tuberculous. The figures in this group are, of course, too small to be significant. In the 20-25 group 14 out of 283 (4.9%), in the 25-30 group 14 out of 176 (7.9%), and in the 30-35 group 13 out of 182 (7.1%) were tuberculous.

Physical Signs

TABLE IIId.—*Results of Investigation of Recruits Referred on Account of Physical Signs*

Age Groups	Tuberculous			Observation	Non-tuberculous	Total
	Pulmonary		Non-pulmonary			
	T.B. +	T.B. −				
18-20	—	1	—	—	13	14
20-25	—	1	3	—	91	95
25-30	3	1	—	3	55	62
30-35	1	2	—	3	39	45
Totals	5	5	3	6	198	216

Table IIId shows the results of the investigation of those recruits referred on account of physical signs. Out of 216 examined, 12 (5.5%) were found tuberculous, and 6 were kept under observation. The figures in the 18-20 group are again too small to be of any significance. In the 20-25 group 4 cases out of 95 (4.2%), in the 25-30 group 4 out of 62 (6.4%), and in the 30-35 group 3 out of 45 (6.7%) were tuberculous.

TABLE IV.—*Total Recruits Referred who were not previously known to the Tuberculosis Service, and who were found to be suffering from Tuberculosis*

Age Groups	Tuberculous			Total	Observation
	Pulmonary		Non-pulmonary		
	T.B. +	T.B. −			
18-20	1	4	—	5	—
20-25	9	23	3	35	8
25-30	9	29	1	39	12
30-35	10	23	—	33	10
Totals	29	79	4	112	30

Table IV summarizes in age groups the recruits not previously seen by the Association (of which the totals are given in Table II), found to be either suffering from tuberculosis or sufficiently under suspicion to need further observation. Only 59 men aged 18 to 20 were referred by the medical boards, and these were volunteers. Five of them were found to have pulmonary tuberculosis. In the 20-25 group 729 men were referred: 32 had pulmonary tuberculosis and 3 non-pulmonary tuberculosis—a total of 35 (4.8%). Out of 524 in the 25-30 group 38 had pulmonary tuberculosis and 1 non-pulmonary tuberculosis—a total of 39 (7.4%). In the 30-35 group 33 out of a total of 557 referred had pulmonary tuberculosis—a percentage of 5.9.

To sum up, 112 cases of tuberculosis were found among 1,869 recruits referred who were not previously known to the Tuberculosis Service—a percentage of 6; and 30 other cases were kept under observation.

In order to furnish some idea of the average number of cases found tuberculous among male patients referred to the Association through the usual channels in the course of a year in the same age groups, the figures for 1940 are given in Table V.

TABLE V.—*Male Cases aged 18 to 35, other than Recruits, Referred to Tuberculosis Officers during 1940*

Age Groups	Tuberculous				Observation	Non-tuberculous	Total
	Pulmonary		Non-pulmonary	Total			
	T.B. +	T.B. −					
18-20	39	46	17	102	24	264	390
20-25	102	102	25	229	41	583	853
25-30	67	59	22	148	22	536	706
30-35	83	75	13	171	23	583	777
Totals	291	282	77	650	110	1,966	2,726

It will be seen that out of a total of 2,726 cases 650 (23.8%) were tuberculous, and a further 110 were under observation. It should be borne in mind, of course, that all these patients had suffered from such a degree of ill-health that they had found it necessary to consult a doctor, and had been referred by him to the Memorial Association on account of signs or symptoms suggestive of tuberculosis.

Discussion

It may be pointed out that the diagnosis of pulmonary tuberculosis was arrived at by our medical officers only after a careful correlation of symptoms, physical signs, sputum examination, and radiological findings. Following the teaching of the Trudeau Sanatorium, special significance was attached to certain symptoms and signs—namely:

1. History of pleurisy with effusion.
2. History of frank haemoptysis of more than 1 drachm.
3. Persistent rales at one apex.
4. Radiological evidence of infiltration of the lung parenchyma.

No recruit was regarded as suffering from tuberculosis unless there was radiological evidence of infiltration in the lung parenchyma for which no other cause could be found. If the evidence pointed to the presence of a healed lesion, this was not included in the diagnosed group. In all cases diagnosed as tuberculous the lesion was considered to be "active," and in most of them institutional treatment was indicated. We found that medical boards varied considerably in their conception of the indications for reference. For example, several of them referred practically every man giving a history of contact with tuberculosis, while others appeared to attach less importance to this factor.

As already stated, 3,049 recruits were referred to the Memorial Association, but 1,180 of them were cases previously known; 656 of the latter had at some time or other been found to be suffering from tuberculosis, 9 were still under observation, and 515 were old non-tuberculous cases. Undoubtedly many old cases in which the diagnosis of tuberculosis was obvious were not referred by the medical boards. This group is of little importance so far as the present investigation is concerned.

Of the 1,869 new cases referred, the numbers in the three quinquennial groups 20-25, 25-30, and 30-35 are 729, 524, and 557, respectively; the numbers found to be tuberculous in each group are practically the same—namely, 35, 39, and 33. It is not suggested that these figures give any indication of the incidence rate of tuberculosis in these groups, or that the cases referred are in any respect a typical cross-section of the population. This group of new cases is to some degree selective, but, on the other hand, the patients composing it do not fall into the same category as the normal new cases referred to the Memorial Association. The large majority had not found it necessary to consult their own doctor on account of ill-health. On the other hand, the medical boards, upon examination, discovered some reason for referring them to the tuberculosis officer. They therefore fall into an intermediate group.

We wish to stress the point that the figures summarized below are not incidence rates of tuberculosis in the relevant age groups, but are percentages of cases found tuberculous among men referred to the Tuberculosis Service.

Summary of Percentages of Cases found Tuberculous

Age Groups	Contact History	Significant Past Personal History	Present History	Physical Signs	Total
20–25	4.6	5.1	4.9	4.2	4.8
25–30	7.6	7.2	7.9	6.4	7.4
30–35	5.5	4.6	7.1	6.7	5.9
Totals	5.6	5.4	6.8	5.5	6.0

There is only a slight variation in the percentage of cases found tuberculous under the main reference categories. The highest proportion of cases suffering from tuberculosis was found among those referred on account of "present history." This might have been expected in view of the fact that these men actually complained of indifferent health at the time of examination by the medical boards, and the symptoms were sufficiently suggestive of tuberculosis to warrant their being referred to the tuberculosis officers.

The percentage of those found tuberculous referred on account of contact history fully justifies the importance of contact examination, at any rate of young adult males, especially as most of these cases had a multiple family history.

The medical boards appear quite rightly to have attached importance to a previous history of haemoptysis or pleurisy. We appreciate that, as stated by Gregory Kayne (1940), "little reliance can be placed on a man's statement that he has suffered from pleurisy unless he has been admitted to hospital"; but out of a total of 499 cases among the 3,049 referred who stated they had had a previous pleurisy 116 (23%) subsequently developed active pulmonary tuberculosis. Out of 156 who stated that they had had a frank haemoptysis of at least 1 drachm, 45 (28%) were found to have tuberculosis.

Most of those referred on account of physical signs made no complaint at all of ill-health, and the percentage of 5.5 found tuberculous proves that a physical examination of the patient may provide the first evidence of the existence of diagnosable disease.

Our results show that the standards adopted by medical boards for deciding upon the reference of cases to tuberculosis officers should not be too rigid.

In the following table the percentage found tuberculous among the "new" recruits referred is compared with the percentages of "ordinary" male new cases found tuberculous in the same age groups.

Age Groups	Recruits	New Cases Examined in 1940
20–25	4.8	26.3
25–30	7.4	20.9
30–35	5.9	22.0
Totals	6.0	23.8

The highest percentage of recruits found to be suffering from tuberculosis falls in the 25-30 age group, and the highest for the new cases in the 20-25 group. Of male new cases aged 18 to 35 examined by the Memorial Association during the year 1940 24% were tuberculous. This is four times the number observed among the new recruits; but, nevertheless, this figure of 6% for recruits is high, having regard to the fact that these men did not suffer from such a degree of ill-health as to make it necessary for them to consult their own doctors.

According to Dr. Robert E. Plunkett (1941), General Superintendent of Tuberculosis Hospitals of the New York State Department of Health, "19, or 1.4%, of the 1,401 men called under the Selective Service Act and given physical examination and chest *x*-ray during the week of November 25, 1940, were found to have tuberculosis." This group of 1,401 is not comparable to our group of recruits, as it was not in any way selected, all recruits in New York State being subjected to a radiological examination. It is, however, rather more comparable than the "ordinary male new cases" referred to the Memorial Association's staff in the course of work through the usual channels. Our figure of 6% found tuberculous is more than four times that given by Dr. Plunkett.

Several countries, including the Dominion of Canada and the Commonwealth of Australia, have adopted a scheme whereby all recruits are subjected to radiological examina-

tion, and we are of opinion that our figures are significant enough to justify the adoption of a similar scheme in this country.

Conclusions

Of 1,869 recruits referred to the Welsh National Memorial Association's tuberculosis officers by the medical boards and then seen for the first time, 112 (6%) were found to be suffering from active tuberculosis, as compared with 23.8% of male new cases in the same age group examined in 1940 in the ordinary course of work, and with 1.4% of the men called up and examined as a routine measure, and not because they were referred by medical boards, by Dr. Robert E. Plunkett.

Of the 112 recruits found tuberculous, 108 (or 5.7% of all those referred) had pulmonary tuberculosis, and 4 (0.3%) non-pulmonary tuberculosis.

An additional 30 cases (1.6%) required further observation.

The percentage figures of cases found tuberculous analysed under the four main headings set out in Table II show that the indications for the reference of cases by medical boards to tuberculosis officers should be comprehensive, and even then cases of active or latent tuberculosis may be missed. It is better that the total cases referred should be large, and the percentage found tuberculous low, than that only a few cases should be referred, with a high percentage found tuberculous.

The finding of a substantial number of tuberculous recruits in Wales strongly supports the view held by most tuberculosis workers that all recruits should be subjected to a radiological examination. It is regrettable that the Horder Committee has advised that this "was impracticable at the present time." The difficulties are appreciated, but with the modern developments of miniature radiological technique (Cranch, 1940) we feel it would have been a task not impossible of accomplishment, and at a reasonable cost.

It is unfortunate that the Public Health (Tuberculosis) Regulations, 1940, were not in force when the first age groups were called up, as these regulations apply only to men aged 33 and upwards and the "new 20's."

The percentage of cases (6.6) found tuberculous who were referred by medical boards to tuberculosis officers solely on account of an intimate contact history emphasizes the importance of the contact examination of young adults, and it would be well if all recruits with a family history of tuberculosis were referred to the Tuberculosis Service by the medical boards.

Our thanks are due to Prof. Picken, Mansel Talbot Professor of Preventive Medicine, University of Wales, for his very valuable advice and assistance. The tuberculosis officers of the Welsh National Memorial Association readily put all their records at our disposal and gave every help. To Dr. D. A. Powell, principal medical officer of the Memorial Association, we are particularly indebted for making this investigation possible and for his guidance throughout.

ADDENDUM

Since writing the above, an exhaustive report on pulmonary tuberculosis in recruits has been published by Major Douglas Galbraith (1941), Deputy Assistant Director-General of Medical Services, Australian Army Medical Corps, together with the report on the bacteriological examinations by Reginald Webster (1941), Honorary Major, Australian Army Medical Corps Reserve.

More than 100,000 recruits of the Australian Imperial Forces have been subjected to routine chest *x*-ray examination by the method of miniature radiography, and of that number 0.56% presented radiological evidence of active pulmonary tuberculosis; 1.04% gave radiological evidence of active or latent tuberculosis of the reinfection type; and 0.25% and 0.12% showed radiological evidence of non-tuberculous pulmonary pathology and of cardiac or vascular lesions, respectively.

The importance of radiological examination of all recruits is stressed by Major Galbraith, who gives three main reasons as follows:

> "Disregarding the humanitarian aspect and examining the problem strictly from the Army standpoint, the most important factors which operate when a soldier develops active tuberculosis are: (1) the loss of his services and of the work hours spent in giving him his military training; (2) the danger of his infecting others in the close proximity entailed in hutments and tents; (3) the financial loss to the taxpayer represented by the cost of treatment and by pension."

His figures are, of course, not comparable with our figures any more than are those of Dr. Plunkett.

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TRICHLORETHYLENE AS AN INHALATION ANAESTHETIC

BY

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WITH A PREFATORY NOTE

BY

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Prefatory Note

Some months ago, in my capacity as honorary secretary of the Anaesthetics Committee, I received a letter from Mr. C. Chalmers of Muswell Hill asking for information about the anaesthetic properties of trichlorethylene. I had at the time no information on the subject, but, from the references that I could find (and these were very few, as I was working at a distance from all medical libraries) and from the very pregnant facts supplied by Mr. Chalmers himself, it seemed obvious that the anaesthetic properties of this drug merited an investigation by my committee. After some correspondence with my friend, and colleague on the committee, Mr. C. Langton Hewer, I was glad to know that he was in entire agreement with me and, further, was himself willing, even anxious, to undertake the investigation. Needless to say, it could not have been placed in more competent hands, and this paper, although only an interim report, certainly suggests that the research was completely justified.

My purpose in writing this prefatory note is not only to record the facts stated above but also to secure adequate recognition of the unusual part taken by my correspondent. Mr. Chalmers is not himself a medical man, though he appears to be a proficient chemist and to possess an uncommon knowledge of medical matters. At the time the investigation began we were all unaware that trichlorethylene was obtainable in this country in a form pure enough for inhalation, and in consequence Mr. Chalmers himself prepared and provided at his own cost the supplies of the drug that were first employed. It was only some time later, when this supply had been used up, and Mr. Chalmers, owing to war conditions, found himself unable

to prepare any more, that he suggested application to Imperial Chemical Industries. We then found that this firm was already manufacturing, under the trade name of "trilene," a purified form of the substance specially prepared for medical purposes, though with no reference to inhalation or general anaesthesia. Trilene is, in fact nothing but specially purified trichlorethylene to which a small proportion of a stabilizing agent has been added.

Even before communicating with me Mr. Chalmers had made experiments to test the anaesthetic qualities of trichlorethylene. He explained to me that, not being a medical man, the only subject upon whom he could experiment was himself. Accordingly, using very makeshift apparatus, he actually anaesthetized himself and carefully noted, so far as was possible, his sensations and the resulting after-effects. In general his report tallied very closely, so far as it went, with Mr. Hewer's later findings, but he specially stressed the absence of nausea and vomiting. He did, however, mention one sequel which is not referred to in the present paper. It may have been accidental, but it is worth recording as a subject for further observation. He noticed, about one day following administration, a slight distension of the intestines accompanied by some pain in the region of the descending colon. This he thought might be due to a decomposition of the inhaled anaesthetic, possibly into carbonyl chloride.

More could be written about the active part taken by Mr. Chalmers in instituting and assisting this investigation, but it seems unnecessary to stress further the credit due to him.

For the information of any who may be interested in the properties of this almost new and apparently useful anaesthetic agent it may be added that although trilene is manufactured by Imperial Chemical Industries it is actually marketed for them by Messrs. Macarthys, Ltd., wholesale chemists, Market Place, Romford, Essex, from whom no doubt adequate supplies are obtainable.

C. F. H.

Physical Properties and Uses of Trichlorethylene

Trichlorethylene has the chemical formula $CCl_2:CHCl$ and is a colourless heavy liquid with a fruity smell which somewhat resembles, but is quite distinguishable from, that of chloroform. The specific gravity of the liquid is 1.47 at 15° C., and its boiling-point is the high one of 87° C. It is not inflammable under any circumstances, nor will its vapour explode when mixed in any proportion with air, oxygen, or nitrous oxide. Pure trichlorethylene tends to decompose in strong sunlight and should therefore be stored in amber-coloured bottles. The addition of 0.01% thymol greatly retards decomposition. The drug has high solvent power for fats, but is practically insoluble in water. It was first described in 1864.

Commercial Uses.—Trichlorethylene is chiefly used for the dry-cleaning of clothes, the de-greasing of metals, and the de-waxing of lubricating oils. For these purposes the fluid is sold under a variety of trade names, such as trethylene, gemalgene, chlorylene, and triklone. These preparations are not pure enough to be used for inhalation.

External Application.—A few years ago the use of trichlorethylene was recommended as a skin cleanser and to clean up dirty wounds and burns (Trumper and others, 1936). For these purposes Imperial Chemical Industries, Ltd., produced a specially purified liquid known under the name "trilene." This product has been generously supplied by the company for inhalation purposes in the work about to be described.

Therapeutic Inhalation.—The drug has been in use for some years for the relief of pain in trigeminal neuralgia. For this purpose the vapour is inhaled from broken capsules as in the case of amyl nitrite. The origin of this procedure is curious. It was reported by two separate observers that patients suffering from chronic trichlorethylene poisoning showed complete bilateral paralysis of all divisions of the trigeminal nerve (Plessner, 1916; Gerbis, 1928). It was supposed that the drug had some specific action on this nerve, and its administration for trigeminal neuralgia was suggested (Oljenick, 1928) and shown to be effective (Glaser, 1931). It appears to me that it is much more probable that the pain is relieved because a state of general analgesia is induced. This condition has been demonstrated several times before consciousness was lost.

Industrial Poisoning.—Several European writers have recorded cases of poisoning in workers in factories when trichlorethylene was employed. Various symptoms have been described, including giddiness, vomiting, optic neuritis, and various palsies (Plessner, 1916; Gerbis, 1928). Some cases have proved fatal (Stüber, 1931). So far as can be ascertained, all the affected patients had been exposed to the vapour of commercial trichlorethylene, which may contain a great variety of impurities.

Animal Experiments

In 1921 Joachimoglu found that pure trichlorethylene vapour was not irritating to the respiratory tract, did not haemolyse the blood, and did not cause fatty degeneration of the liver. In 1934 Herzberg reported that the liver, spleen, kidney, diaphragm, pancreas, heart muscle, lung, adrenal, and pectoral muscle taken from three dogs killed by overdosage of trichlorethylene after having been deeply anaesthetized for periods of two and a half to three and a half hours showed no gross or microscopical pathological changes. In 1935 Krantz and others anaesthetized the same rats repeatedly (up to thirty times) with trichlorethylene. The animals were then killed and the various organs examined. Although some pathological changes were found they were in the main slight and inconclusive. In rabbits slight hyperglycaemia was noted. The same workers found that anaesthesia could not be obtained by rectal administration of the drug and that nerve conduction was not affected by local application of trichlorethylene. In 1939 Lande and others anaesthetized rabbits, guinea-pigs, rats, and mice with trichlorethylene daily for two and a half months, the duration being from fifteen minutes to one and a quarter hours a day. After being killed some inflammatory changes in the liver and kidneys were noted.

It may reasonably be concluded from these extremely severe tests that in animals trichlorethylene is only slightly toxic—certainly much less so than chloroform.

Previous Work in Human Anaesthesia

The only published work which can be traced is that on a series of 300 patients anaesthetized with trichlorethylene by Striker and others in America in 1935. These were all short administrations for minor operations, and in some cases analgesia only was produced. Eight patients became violent in the second stage, and the third stage of anaesthesia could not be reached. One patient stopped breathing from an overdose but recovered under artificial respiration. After-effects were slight, and on the whole the drug was regarded as a satisfactory anaesthetic.

In the following year (1936) the Council of Pharmacy and Chemistry of the American Medical Association considered the evidence for usefulness of trichlorethylene and concluded that "the case had not been completely made out."

After careful consideration of the data summarized above it was thought justifiable to pursue the investigation of trichlorethylene as an anaesthetic in the human subject.

Details of Present Investigation

The number of administrations was 127 and, although this is admittedly a small series, an effort was made to choose representative cases. Most of the commoner major operations were performed under trichlorethylene anaesthesia, their duration varying from seven minutes to three hours ten minutes, the average being about forty-five minutes. The patients were either (a) air-raid casualties, (b) soldiers—most of whom were wounded evacuated from Dunkirk—and (c) ordinary hospital civilian patients. Their ages varied from 14 months to 81 years.

Methods of Administration and Cost

It soon became evident that an open-mask administration was not practicable owing to the low volatility of trichlorethylene. In America a special apparatus has been devised to vaporize the drug, incorporating an air compressor driven by an electromotor (Jackson, 1934). It was felt, however, that if the anaesthetic was to be of any use under Service or oversea conditions, standard apparatus should be employed. In most administrations, therefore, trichlorethylene was put in the chloroform bottle of a continuous-flow apparatus and used as an adjuvant to nitrous-oxide - oxygen. When used with partial rebreathing this method was quite satisfactory. In most cases a face-piece was employed, but, when indicated, a nasal or oral endotracheal tube was passed.

With the CO_2-absorption technique it is essential to have the vaporizer in the patient's respiratory circuit. Insufficient concentration of trichlorethylene is obtained if the basal oxygen feed only is used to vaporize the drug as in the single-phase Waters system or in the two-phase apparatus supplied as standard to the E.M.S.

If the drug had been purchased at hospital price it was calculated that the cost per case would have averaged about 4½d.

Stages and Signs of Anaesthesia

In most respects trichlorethylene resembles chloroform rather than ether, and the signs of the various stages of anaesthesia are similar to those encountered with nitrous-oxide - oxygen with chloroform as an adjuvant. Some degree of general analgesia appears to be present in the first stage, and this was proved to be due to trichlorethylene and not to the nitrous oxide by occurring when pure oxygen was used to vaporize the drug. The second stage was not usually marked, but in one or two patients violent excitement did occur. This can, of course, be avoided by starting with an intravenous barbiturate, but it was not done lest it should confuse the issue. The third stage was characterized by quiet automatic breathing and a variable degree of muscular relaxation. This was sufficient for the operative procedures except in three patients. The first was a muscular young man who was having a partial gastrectomy for ulcer; the second was a patient from whom a large malignant ovarian cyst was removed; and the third was a soldier who underwent manipulation of the spine. In each instance the addition of diethyl ether vapour for a short time secured the necessary relaxation.

One opportunity occurred for observing the effect of trichlorethylene upon the uterine musculature. An abdominal hysterotomy was performed to terminate pregnancy because of active phthisis. The surgeon remarked upon the exceptionally good retraction of the uterus following extraction of the foetus.

After an average of twenty minutes' administration it was found that the vapour concentration of trichlorethylene could be greatly reduced without prejudice to muscular relaxation. On one occasion an overdose was inadvertently given. Respiratory arrest occurred, but no difficulty was encountered in restoring natural breathing. The pulse remained steady throughout.

Effects on Respiratory System

The odour of trichlorethylene is not pungent, nor does its vapour appear to have any irritant effect upon the respiratory passages. It follows that the vapour concentration can be increased quickly, leading to the rapid induction of anaesthesia. No excessive salivation or secretion of mucus was noticed even if premedication had been inadequate or badly timed. Nineteen major thoracic operations were included in the series, as were six abdominal sections on patients suffering from severe chronic bronchitis or active phthisis. In no case was there any noticeable exacerbation of the pulmonary disease.

The depth of respiration was not appreciably altered, but in about 30% of patients some increase in the rate occurred. This usually subsided after fifteen to twenty minutes, but in a few cases it persisted. The respiratory rate was particularly high in some patients during operations involving an open pleura, and this constituted a definite disadvantage in thoracic surgery.

Effects on Cardiovascular System

The blood pressures remained within normal limits except for some rise if the second stage of anaesthesia was marked by much excitement. No case of pronounced shock occurred in the series. The pulse rate was usually slightly higher than normal, as is the case with most inhalation anaesthetics.

Particular attention was paid to the heart rhythm, as trichlorethylene contains three chlorine atoms in its molecule, and at least two other compounds with this characteristic can cause grave cardiac irregularities and even primary cardiac failure. (These drugs are chloroform and trichlorethanol.) (Wood, 1938; Hewer and Belfrage, 1938.) No cardiac irregularities could be detected clinically except sinus arrhythmia in a few young patients, which disappeared when full anaesthesia was reached. Several patients with extrasystoles before operation showed a regular rhythm after anaesthesia had been induced with trichlorethylene. This is, of course, common with most inhalation anaesthetics.

Dr. K. D. Keele kindly took electrocardiograms with the Cossor-Robertson cardiograph during the induction of anaesthesia in 15 cases. Continuous visual direct observation was made in all the cases included. This was started previous to the induction of anaesthesia, when a short photographic record of Lead II was taken; direct observation was then continued until the patient was well into the third stage of anaesthesia, when a second record was made. Of the 15 cases so observed, in 14 there was no alteration in the tracing, apart from a slight decrease in the sinus tachycardia as the third stage of anaesthesia was reached. In one instance regular auricular extrasystoles alternating with normal systoles occurred over a period of some three minutes and then ceased. In two other cases occasional ventricular extrasystoles were seen during the second stage. These disappeared as the third stage was reached. In no case were multiple ventricular extrasystoles seen. These were particularly looked for in view of their comparatively frequent occurrence during chloroform anaesthesia. This limited number of observations thus suggests that there is no evidence of any particular cardiac danger from trichlorethylene.

It seems only fair to mention a fatality which occurred after the conclusion of this series, following the administration of trichlorethylene by a colleague.

The patient was a woman, aged 33, who was to have an empyema drained. Anaesthesia was induced uneventfully with nitrous-oxide - oxygen and trichlorethylene. After a rib resection a large exploring needle was passed in several directions to locate the pus, but without result. At this point temporary apnoea occurred, but natural breathing was soon re-established, and the remainder of the operation was completed under pure nitrous-oxide - oxygen. Just as the wound was being closed the respiration and circulation ceased, apparently simultaneously, and all efforts at resuscitation failed.

The relevant findings at the necropsy were: (1) a localized empyema higher than the exploring needle had reached; (2) free blood in the pleural and peritoneal cavities; and (3) degeneration of the heart muscle. Some air was present in the cerebral arteries, but the diagnosis of air embolism could not be definitely established as the vessels were unfortunately not ligated before the brain was lifted out of the skull.

It is my opinion that trichlorethylene was not responsible for this patient's death, and I have knowledge of an almost exactly parallel case in which local analgesia only was employed. It might be noticed that, since no trichlorethylene had been used for five minutes before circulatory failure occurred, the concentration of the drug in the air passages (with a partial rebreathing circuit) must have been negligible.

Effects on Sugar Metabolism

Dr. A. Jordan kindly made some blood-sugar estimations before, during, and after anaesthesia with trichlorethylene. In no case was there much disturbance, and on taking an average it could be said that there was no significant change. This contrasts with the rise which constantly occurs with chloroform and ether (Hewer, 1939).

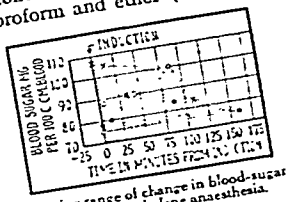


Chart showing range of change in blood-sugar level during trichlorethylene anaesthesia.

One diabetic patient was included in the series. An abdominal operation lasting 1 hour 15 minutes was performed under nitrous-oxide - oxygen - trichlorethylene. The sugar tolerance was tested one week after operation, and was found to be unchanged.

Effects on Blood Urea

Blood-urea estimations were made by Dr. Jordan upon 5 patients before, during, and after anaesthesia. The changes were so slight as to be within the range of experimental error. Here again the contrast with ether and chloroform is marked.

After-effects

Of the series of patients 61% had no nausea or vomiting, 26% had nausea or slight vomiting, and 13% had severe vomiting; 5% complained of headache. Those who had had experience of diethyl ether commented favourably on the absence of an unpleasant taste or smell.

In most cases the urine was tested as a routine on the day after operation. In one instance only was the presence of albumin found but acetone was always absent. This is in marked contrast with other anaesthetics. For example, albuminuria has been found almost constantly after the prolonged administration of ether and in about 20% of patients anaesthetized with chloroform (Stephen, 1929). Acetonuria has been demonstrated in 67% of patients operated upon under all forms of general anaesthesia and in 85% under local analgesia (Schulze, 1924).

No pulmonary complications were observed, and, as already mentioned, existing lesions did not appear to be affected.

Summary and Conclusions

This article must be regarded as an interim report, and it is not suggested that our present knowledge of trichlorethylene warrants its recommendation as an inhalation anaesthetic. At the same time the drug appears to have enough good qualities to render a more exhaustive investigation profitable.

It appears that trichlorethylene generally resembles chloroform but is less potent and less toxic.

It is desired to express thanks for much help from Mr. B. Rait-Smith, who made nineteen administrations; also to Dr. Keele for his electrocardiographic work and to Dr. Jordan for his biochemical investigations.

C. L. H.

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USE OF SULPHAPYRIDINE IN SUBACUTE BACTERIAL ENDOCARDITIS

WITH REPORT OF A CASE

BY

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In the treatment of subacute bacterial endocarditis attention has recently been focused on the use of sulphapyridine combined with heparin. The rationale of this treatment is that the latter drug is thought to prevent the deposition of further thrombus on the affected valves. As a result the bacteria are exposed to the sterilizing action of the sulphapyridine, and the check in the growth of the vegetation gives the processes of repair an opportunity to gain the ascendancy. The results of published cases treated along these lines are noted in Table I.

TABLE I.—*Cases treated with Sulphapyridine and Heparin*

No.	Author	Result
1	Kelson and White (1939)	Death from pulmonary infarct 2 weeks after treatment stopped
2	"	Bedridden with congestive heart failure, but "no evidence of bacterial endocarditis" 19 weeks after treatment stopped
3	"	Symptom-free and negative blood cultures 18 weeks after treatment stopped. Returned to work
4	"	Death during treatment from subdural haemorrhages following emboli
5	"	Death during treatment following a reaction due to faulty heparin
6	"	Little change
7	"	Free from evidence of disease 4 weeks after treatment stopped
8	Friedman, Hamburger, and Katz (1939)	Death during treatment from cerebral haemorrhage. No sulphapyridine used in this case
9	Dockeray and Kawerau (1940)	Death 3 months after treatment stopped
10	Witts (1940)	Death during treatment from subarachnoid haemorrhage
11	Fletcher (1940)	" " " "
12	Petch (1940)	Remained well for 6 months
13	"	Death from intracranial haemorrhage
14	"	" " toxic jaundice
15	"	" " " "

These results are not encouraging. Death from haemorrhage, particularly cerebral haemorrhage, is a very real danger.

Maegraith and Vollum (1938) claim that sulphapyridine is the drug with the most definite inhibitory action on the

growth of *Streptococcus viridans*. On the other hand, Swain (1940) suggests that some strains of *Strep. viridans* may be resistant to sulphapyridine. Sulphapyridine, however, is probably the drug of choice if a chemotherapeutic agent is to be used. It would also be the drug of choice in those rarer cases due to *B. coli*, pneumococci, or haemolytic streptococci. A number of cases have been treated with this drug alone in various doses. The results of published cases are given in Table II.

TABLE II.—*Cases treated with Sulphapyridine*

No.	Author	Result
1	Whitby (1938)	Life undoubtedly prolonged. Clinical improvement in general health and comfort. Anaemia and fever lessened
2	"	
3	Ellis (1938)	Symptomatic improvement, but death 3 weeks after stopping treatment
4	"	Symptomatic improvement. Patient discharged
5	Andrews (1940)	Improvement, but death 2 weeks after starting treatment
6	"	Apparent cure
7	Richards (1940)	Recovery claimed
8	Ravina (1939)	Decided improvement

These results, admittedly in a very small series of cases, are encouraging. Two cases of cure are claimed. In others the authors are emphatic that a decided improvement in the general condition of the patient occurred and that life was undoubtedly prolonged. This is a striking advance. It is possible, also, that those cases treated with sulphapyridine and heparin, and showing an improvement, would have benefited equally with sulphapyridine alone. It would appear, as was pointed out by Donovan (1940), that in the treatment of subacute bacterial endocarditis there seems to be more hope in further chemotherapeutic development than in heparin as an adjunct.

The difficulty to be overcome is the mechanical one of attacking the bacteria embedded in the vegetations. If, however, an adequate concentration of sulphapyridine were maintained in the blood stream over a long period, then, in the event of bacteria becoming exposed—e.g., by the separation of a portion of thrombus—they would be liable immediately to be attacked by the chemotherapeutic agent already present. In the majority of the cases quoted above (Table II) treated with encouraging results with sulphapyridine alone, embolic phenomena were frequent.

That sulphapyridine may be given continuously over long periods is suggested by the work of Coburn and Moore (1940). These authors administered 3 grammes of sulphanilamide daily continuously for periods of several months as a prophylactic measure in rheumatic children. No major toxic effects were noted. It is suggested, therefore, that in cases of subacute bacterial endocarditis treated with sulphapyridine an initial full course be given to sterilize the blood stream, followed by a smaller dose given continuously over a long period to maintain this sterilization and to attack the bacteria in the vegetation as the opportunity arises. A case treated along these lines is described.

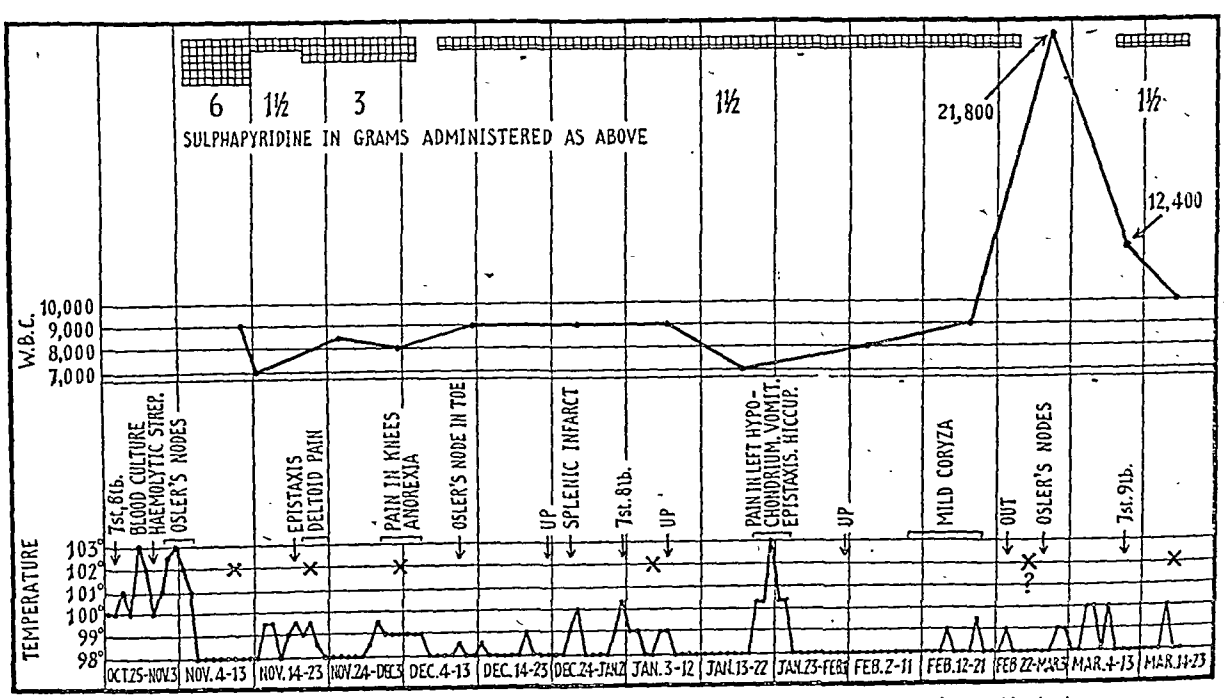
Report of Case

The patient, a man aged 20, had had rheumatic fever when 9 years old and again when 13. On each occasion he had spent three months in bed, followed by two months' convalescence. His heart was said to be affected at the second attack. In September, 1940, he complained of tiredness, breathlessness on exertion, and, later, of poor appetite, nausea, constipation, and pains in the fingers. He was admitted to hospital on October 25.

On examination a pale, tired-looking young man was seen lying listlessly in bed. He was undersized, poorly developed, and poorly covered; height 5 ft. 5 in., weight 7 st. 8 lb. He had typical café-au-lait complexion and hot moist skin. There was slight clubbing of fingers; and two or three Osler's nodes appeared daily, at the outset, in the pulp of fingers and toes. Neither jaundice nor pitting oedema was present. The temperature was 100°, the pulse 100, and the respirations 20.

There was visible precordial pulsation in the fifth intercostal space lateral to the nipple line, and a systolic thrill could be felt in this area. The apex beat was forceful, 9 cm. from the midline; the mid-clavicular line was 8.5 cm. from the midline. Apical systolic and basal systolic and diastolic murmurs were present. These murmurs and the quality of the heart sounds varied considerably in character from day to day. A radiograph on March 10, 1941, revealed mitral heart—measurements: transverse diameter 14 cm., longitudinal diameter 17 cm. The spleen was not palpable, but dullness over the splenic area extended to the costal margin. The urine contained albumin and red blood cells.

The patient was kept strictly at rest in bed and was nursed as much as possible near an open window. He was given iron, yeast, and cod-liver oil and malt. On October 31 a blood culture yielded a profuse growth of haemolytic strepto-



The daily temperature noted above represents the highest reading recorded on a four-hourly chart. × = Negative blood culture.

occi. His general condition remained extremely poor until sulphapyridine was started on November 5, 1 gramme being given four-hourly. A very decided improvement was evident in the course of a few days. The sulphapyridine was reduced on the 14th to 0.5 gramme thrice daily, but was increased on the 21st to 0.5 gramme four-hourly because of a return of fever. It was stopped on December 6, as persistent anorexia developed, but was restarted in doses of 0.5 gramme thrice daily on December 9 and was maintained continuously at this level until February 25, 1941.

During this time the improvement in the patient's condition continued, although it was interrupted temporarily on several occasions by minor upsets (see Chart). Four successive blood cultures were negative. The fifth unfortunately was contaminated, but the sixth was again negative. There was a striking decrease in the frequency of Osler's nodes while sulphapyridine was being given. A blood count on December 3 showed red cells, 4,400,000 per c.mm.; haemoglobin, 70%; colour index, 0.8; white cells, 8,600 per c.mm.—polymorphs, 74%; eosinophils, 1%; lymphocytes, 24%; monocytes, 1%. On March 1 the readings were: red cells, 4,530,000 per c.mm.; haemoglobin, 85%; colour index, 0.9; white cells, 21,800. Leucocyte counts, made at frequent intervals throughout, varied between 7,000 and 22,000 per c.mm. (see Chart). The blood concentration of sulphapyridine while 0.5 gramme was being given thrice daily was: free 1.2 mg., acetylated 1.3 mg. per 100 c.cm. The sulphapyridine was discontinued on February 25 in view of the very decided improvement. As fever returned it was restarted on March 10 and was continued until discharge.

By the date of discharge the patient was up for the greater part of the day, and was out for several hours in the afternoon. He insisted on being discharged because he felt so well.

Comments

The outstanding result of the treatment was the change in the patient's condition. From a miserable tired young man bathed in sweat he became cheerful and active and had long periods free from fever. An advanced case of subacute bacterial endocarditis was arrested and very decidedly improved. As occurred in Whitby's (1938) cases the anaemia also improved. Another interesting result was the striking diminution in the number of Osler's nodes while sulphapyridine was being given

A total of 241.5 grammes of sulphapyridine was administered. Apart from transient nausea and anorexia, no toxic effects were noted. Whitby (1938) states that resistance to the drug may develop. That this did not occur in the case reported here is suggested by the fact that when the drug was discontinued after 226.5 grammes had been given the fever that followed was readily controlled by further small doses.

The case is unusual in that the streptococcus isolated was of the haemolytic type, and the encouraging results obtained may have been due in part to the fact that this organism is more readily destroyed by sulphapyridine than is the *Strep. viridans*. The outstanding problem, however, in the treatment of subacute bacterial endocarditis is the inaccessibility of the organisms in the heart valves rather than the sterilization of the blood stream, and it is probable, therefore, that, as has been argued above, cases in which the infecting organism is a *Strep. viridans* will also show a good response to similar treatment.

Summary

Published cases of subacute bacterial endocarditis treated with sulphapyridine and heparin and with sulphapyridine alone are reviewed briefly.

The encouraging results in those cases treated with sulphapyridine alone are noted.

A scheme of treatment is suggested, and a case so treated with considerable benefit is described and briefly discussed.

I am indebted to the Department of Health for Scotland for permission to publish this case. My thanks are also due to Dr. A. A. F. Peel for helpful criticism throughout.

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HYPERVENTILATION TETANY IN TROPICAL CLIMATES

BY

ALEC WINGFIELD, M.D., M.R.C.P.

Physician with Charge of Out-patients, Seamen's Hospital; Physician Emergency Medical Service

It seems clear that tetany is only one of the many clinical manifestations which can result from hyperventilation. The early experimental and clinical observations of Haldane and Poulton (1908), Vernon (1909), Henderson (1909-10), Hill and Flack (1910), Henderson and Haggard (1918), Collip and Backus (1920), Grant and Goldman (1920), Davies, Haldane, and Kennaway (1920), Barker and Sprunt (1922), and Goldman (1922) established the importance of hyperventilation as a cause of tetany, and the subject has been widely discussed in recent years. Its literature has now become tremendous, but an excellent review of the then known facts was published by Thomson and Collip in 1932.

It is now recognized that there are many aetiological factors, of which psychic changes and pain would seem to be the most important. McCance (1932) showed that in certain persons tetany could be induced by attacks of overbreathing which were scarcely perceptible to casual observation; he considered that these persons must be peculiarly susceptible to an alkalosis. It is widely agreed that there are great variations in individual susceptibility to hyperventilation, and in this connexion the work of Schultzer and Lebel (1939) is of interest. Serum calcium is generally accepted to be normal in these cases, while Fowweather, Davidson, and Ellis (1940) have shown that immediately after the attack the serum inorganic phosphorus may be considerably below the normal level. All the evidence at present goes to show that overbreathing produces an alkalosis by washing out carbon dioxide from the blood. The mode of production of tetany by alkalosis is still in doubt. The conclusion of Fowweather and his colleagues (1940) that it is due to tissue alkalosis seems to be fairly well founded.

Effect of Temperature upon Ventilation

Bazett and Haldane (1921) described the effects of the immersion of four men in hot baths for a long period. They noted that sweating occurred early, and that a rapid rise of temperature produced hyperpnoea, which was accompanied by faintness, mental confusion, and tingling. They also observed that these symptoms could be relieved by breathing mixtures containing high percentages of carbon dioxide. The secretion of a large amount of highly alkaline urine was also recorded. This work was confirmed by Landis and others (1926), who noted the occurrence of tetany and found that the degree of change in the blood *p*H did not appear to be in direct relation to the onset of tetany. One of the cases recorded by McCance (1932) was that of a nursing sister whose first and only spon-

taneous attack occurred in an operating theatre, where the temperature may have been considerably above the normal met with in this country and where the clothing is often excessive.

It is a little surprising that no work appears to have been done upon the subject of hyperventilation tetany in tropical climates. In this connexion the following case report is of interest.

Case Report

A ship's engineer aged 27, in good general health, gave a history that while in intense heat in the Persian Gulf he suffered from profuse perspiration leading first to tingling and cramps and, after "a few minutes," to spasm of hands and feet. He was seen by a doctor after this attack, and was found to have a slow pulse but no other abnormal physical signs. He reported that a similar attack had occurred in a hot climate seven years previously. It was thought that the tetany might have been produced by hyperventilation, since the conditions appeared to resemble closely those produced experimentally by Landis and others (1926). He was therefore instructed to breathe quickly and deeply, and after approximately two and a quarter minutes he reported that tingling of the hands and feet had started; overbreathing for a further thirty seconds produced a typical *main d'accoucheur*. The blood calcium was determined almost immediately after this and gave a value of 8.3 mg. per 100 c.cm. On subsequent occasions two further attacks of tetany were deliberately produced. The resting blood calcium on another occasion was 9.7 mg. per 100 c.cm., and the blood chlorides estimated at the same time were within the limits of normal.

Discussion

The identity of attacks of tetany produced by deliberate overbreathing and of those which occurred spontaneously in the Persian Gulf seems certain. This appears to be the first clinical description of overbreathing tetany due to heat. Further investigation will probably lead to the recognition of more cases due to this cause.

I wish to record my thanks to Dr. Arthur Davies for the pathological investigations, and to Dr. R. A. McCance for his very helpful criticism.

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Medical Memoranda

Paralysis accompanying Herpes Zoster

The articles by Drs. Barham Carter and J. B. W. Dunlop and by Major Spillane in the *Journal* of February 15 (pp. 234, 236) prompt me to record two cases from my practice.

Case 1.—An active, healthy, and muscular man aged 70, who had been subjected to great anxiety in August, had intense pain of right fifth cervical distribution for three days, culminating in a typical eruption of herpes zoster on September 16, 1940. On the 19th two complications ensued; first a generalized rash which became vesicular and indistinguishable from varicella; secondly, weakness of the right shoulder and arm. The chicken-pox rash ran a normal course, the patient being very ill for two days. The paralysis was complete in the deltoid, biceps, brachialis, triceps, scapular muscles, and clavicular head of the pectoralis major. The forearm and hand, including the brachio-radialis, were unaffected. After consultation with Dr. Booth of Wolverhampton with reference to treatment, a radiograph was taken on November 7; this showed advanced osteo-arthritis of the cervical vertebrae, particularly of C3, C4, C5, and C6. Examination on March 3, 1941, revealed a fairly strong triceps (this showed early improvement) and definite though very weak contraction in the biceps. The paralysis of the deltoid and infraspinatus muscle is complete and seems unlikely to recover.

The features of this case are: (1) the severity of "infection" evinced by the varicella; (2) the association of three factors similar to those in Case 1 of Drs. Barham Carter and Dunlop—namely, posterior root ganglion infection, marked osteo-arthritis of the neighbouring vertebrae, and infection of the grey matter of the corresponding spinal segment. It seems to me that the infection is not likely to spread to the cord except in the presence of an accessory factor.

Case 2.—An active man aged 75 had intense pain over the right side of the face and head for three days, followed by a typical herpetic eruption over the area supplied by the second and third divisions of the fifth nerve on March 1, 1941. There was some vesiculation in the external auditory meatus, but no evidence of otitis media. This was followed by a typical right Bell's palsy on March 4, but I am unable to say if the taste sense of the right half of the tongue was affected. This case followed so closely the course of those reported by Major Spillane and later by others as to need no comment. It does, however, help to outline a definite clinical entity which seems not to be excessively rare at the present time.

Stafford. G. I. WILSON, B.M., F.R.C.S.Ed.

Acute Intestinal Obstruction caused by Twisted Ovarian Cyst

The following case is reported because it presents some unusual features.

CASE REPORT

The patient, a 7-para African woman, was admitted to the Bahamas General Hospital on November 3, 1940, with a history of absolute constipation for six days, neither faeces nor flatus having been passed for that time. There had been vomiting for four days, the vomitus still being clear on admission to hospital. The abdomen was distended and tympanitic. There was no visible peristalsis. The temperature was 98.4° F., the respirations 40, and the pulse 160. A turpentine enema produced a few scybala, the return otherwise being clear. Rectal and vaginal examinations showed the rectum to be quite empty following the enema. A diagnosis of acute intestinal obstruction probably due to a volvulus was made.

Under spinal anaesthesia the abdomen was opened by a subumbilical paramedian incision through which the distended intestines immediately protruded. 1 c.cm. of pitressin somewhat reduced the trouble due to the distended gut. The abdominal cavity contained a small quantity of blood-stained fluid and a few small blood clots. Further investigation revealed a plum-coloured necrotic mass in the pelvis; this was identified as an ovarian cyst which had twisted on its pedicle and involved the corresponding Fallopian tube. The tube and ovary were removed *en masse*, and the abdomen was closed in layers. Ephedrine sulphate, 1/2 grain, was given subcutaneously, followed by 1 c.cm. of pituitrin. The patient's condition was poor at the termination of the operation, and on return to the ward 1,000 c.cm. of a 5% solution of glucose in normal saline was given intravenously. The next day she began to pass flatus per rectum, and thirty hours after operation a spontaneous bowel movement took place. Neoprontosil in doses of 5 c.cm. was given daily for three days. Convalescence was uneventful, and the patient was discharged fifteen days after admission to hospital. The cyst was an ovarian dermoid containing the usual greasy material and hair.

It would seem that the obstruction was caused by a reflex nervous paralysis of the lower part of the gut due to the twisting of the ovarian pedicle. Later, absorption of toxins from the strangulated and necrotic tubo-ovarian mass and from the distended and inactive intestines would have tended to aggravate the condition.

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Reviews

OPERATIVE GYNAECOLOGY

Gynaecological Operations. By J. Lyle Cameron, M.D., F.R.C.S., F.A.C.S., M.R.C.O.G. Oxford Medical Publications. (Pp. 200; illustrated. 21s. net.) London: Oxford University Press. 1941.

"The purpose of this book is to present the technique of gynaecological operations as clearly and concisely as possible, giving the indications and contraindications, and pointing out difficulties, dangers, and complications against which the surgeon must be warned." This quotation from the preface makes clear the task the author set himself to accomplish. He has arranged his material into five chapters, which deal with pre-operative investigations, vulval operations, vaginal operations, cervical operations, and abdominal gynaecological operations. A comprehensive index is provided and makes reference easy, the more so as all main headings in the text stand out clearly in heavy type.

The opening chapter on pre-operative investigations includes short sections dealing with general and local preoperative treatment in which the author records what is presumably the routine he adopts for his own cases, but alternative methods of preparation are not given much prominence. A surprising mistake which escaped the editorial pen is found on page 5, where a famous antiseptic is spoken of as "Boney's violet-green solution." Chapter 2 summarizes vulval operations and deals with the indications for operation and the technique advised, together with a short note on the dressings and after-care. Chapter 3 discusses vaginal operations under similar headings, and includes a particularly clear account of the variations of technique in vaginal hysterectomy as well as an account of the McIndoe operation for congenital absence of the vagina. Chapter 4 deals with cervical operations and includes a useful concise discussion on uterine perforation and its treatment.

Abdominal gynaecological surgery is discussed in the last two chapters. The advice given on drainage will not be widely accepted, for there are few gynaecological surgeons who would accept the statement that drainage is advisable after posterior wall myomectomy, the division of adhesions, or the removal of inflamed appendages. The complications of abdominal surgery are well summarized and are grouped as those common to all operations and those most likely to occur after individual ones such as hysterectomy and myomectomy. Illustrations are not numerous, but are for the most part well chosen and are beautifully drawn and produced.

The task the author set himself has been well accomplished, and yet there is something not completely satisfying about the book. Possibly it is that one wonders whether there really is such a thing as "the technique of gynaecological operations." There are different schools of thought and practice in this as in all branches of surgery, and technique is not the monopoly of any one of these. Probably, however, dissatisfaction springs from a deeper source. For whom is the book intended? Much of its contents will be valuable to the medical student, but as he is seldom expected to have more than a superficial acquaintance with operative technique the book is not likely to commend itself widely to the undergraduate. Few general practitioners will be interested in a volume of this nature, and the young gynaecological consultants will find it too elementary to be of much assistance. The book could be expected to make its greatest appeal to the general surgeon who is obliged to perform gynaecological operations, but fortunately with the increasing influence of the Royal College of Obstetricians and Gynaecologists this branch of surgery is being entrusted more and more to those men who have been specially trained to perform it. One's disappointment, therefore, is probably due to the suspicion that a book which would have been heralded as a good one ten years ago has unfortunately arrived a little too late.

CARE OF SICK CHILDREN

A Textbook on the Nursing and Diseases of Sick Children for Nurses. By Various Authors. Edited by Alan Moncrieff, M.D., F.R.C.P. Third edition. (Pp. 640; 142 illustrations. 21s. net.) London: H. K. Lewis and Co., Ltd. 1941.

It might have been thought that this book would fall between two stools, that it would contain too much information for a nurse and not enough for a doctor. The appearance of a third edition, however, evidently shows that it meets a want. In the present edition, which is fifty pages longer than the last, the whole book has been thoroughly revised and new methods of treatment are adequately described. It is a little surprising, however, to find that in the treatment of meningococcal meningitis the use of sulphapyridine is given less space than that devoted to anti-meningococcal serum, although it is admitted that the new drug is replacing serum treatment—surely an understatement. In the appendix on the action of drugs, too, sulphanilamide is included among drugs "affecting the circulation," which is hardly where a pharmacologist would class it. A new chapter on children in the Tropics, by Lieut.-Colonel Vere Hodge, is a valuable addition to the book, and the same may be said of the appendix by Miss D. Lewis describing briefly methods of physiotherapy. The illustrations, always excellent, have been considerably increased in number, and altogether the new edition will enhance the already great popularity of the book among both children's nurses and paediatrists.

MEMORIES OF A CORONER

Inquest: A Coroner Looks Back. By S. Ingleby Oddie, M.B., C.M., Barrister-at-Law, formerly H.M. Coroner for Central London. (Pp. 255; illustrated. 10s. net.) London: Hutchinson and Co. (Publishers), Ltd. 1941.

To be coroner for Central London for half a life-time must obviously give the raw material for many exciting books, and Mr. Ingleby Oddie has made good use of an outstanding opportunity. He recalls and illuminates most of the first-class sensational murders and accidents of the period. In fact, he goes back to 1888 and gives, at second hand, a full account of the ghastly "Jack the Ripper" crimes, on which he was informed by the contemporary police surgeon for the City. His own career in the legal handling of crime began with the Crippen case, in which he held the junior brief for the Crown. While still at the Bar he was also concerned in the trial of Steinie Morrison, the "Clapham Common murderer." After he became a coroner in 1912 sudden death in innumerable grisly forms, sometimes merely sordid and sometimes highly dramatic, was his daily fare. His selection from his records of these inquests is miscellaneous in the widest sense, but among its particularly interesting items is his reminiscence of the cocaine case, in which the young actress Billie Carleton, a drug addict of 22, was found dead, and which disclosed the scandalous traffic in drugs which existed in London just after the last war. This case was probably one of the most important single factors in the passage of the first Dangerous Drugs Act. Mr. Oddie relates the inquest on Field-Marshal Sir Henry Wilson, who was shot by two Sinn Feiners on his own doorstep; on the victim of the trunk murder of 1927; on ten persons drowned in base-

ment bedrooms by the overflowing, on an exceptionally high tide, of the Thames at Westminster in January, 1928; on the workman who was killed in the gas explosion which blew up a large part of Bloomsbury some months later; on Vera Page, the little girl whose violator and murderer was never brought to trial; on the unhappy gentleman who insured his life heavily and deliberately shot himself in a taxicab for the benefit of his creditors, and set on foot an expensive leading case on the liability of the insurers of a suicide; and on a host of other victims. The times in which we live give a new interest to his account of the case in which two soldiers, part of the escort of a deserter, shot a man dead as he attempted to escape; and of the bombing of Odhams Press building, in the basement of which a large number of persons were crushed by falling masonry and machinery. (That disaster, which was front-page news for two or three days when it happened in the last war, would pass almost unnoticed to-day.) In between these high lights come numerous smaller but equally interesting recollections.

This book, written by one of the most capable coroners of his time, illustrates clearly the merits and defects of the coroner system. Mr. Oddie has an admirable and varied background of public school, the Naval Medical Service, and the Bar. His book is modest and objective and by no means without humour. It therefore all the more strikingly reveals his almost complete lack of insight into criminal psychology. That is not necessarily a defect in a coroner, whose business is to find out the circumstances in which death occurred; but it is typical of the era in which he worked, and the end of which saw an advance in criminal psychology greater than any that had been made during the previous century.

Notes on Books

Textbook of Pharmacology for Nurses, by Profs. MARGENE O. FADDIS and J. M. HAYMAN, jun. (J. B. Lippincott Company: 15s.), is written with the object of explaining to nurses not only the technique of administering drugs correctly but also the nature of the effects they are intended to produce. A simple but clear account is provided of the mode of action of drugs and the illustrations and charts are very well chosen. An interesting feature of the volume is a chapter on the protection of the public in its use of drugs and cosmetics. This gives a short account of the U.S. Food and Drugs Acts.

Herb Gathering, by BARBARA KEEN and JEAN ARMSTRONG, is a booklet which describes the gathering of plants for medicinal use (London: Brome and Schimmer; 9d.). The authors give a few pages of excellent practical instructions for the collection and drying of plants, and this is followed by descriptions, with illustrations, of about sixty plants. It is rather surprising to learn that so many of our native plants find a use in herbal medicine.

Preparations and Appliances

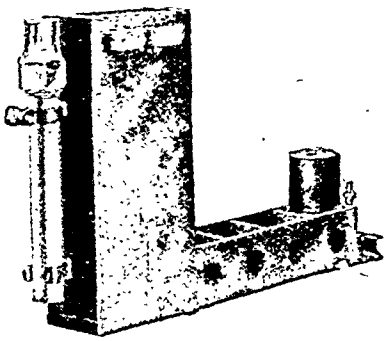
EMERGENCY HYPODERMIC OUTFIT

Dr. M. W. GEFFEN (Hampstead, N.W.3) writes:

Some weeks ago doctors were asking for a method of carrying hypodermic medication in a form suitable for immediate use in air-raid or similar emergencies. The outfit here illustrated has been designed by me with the assistance of Messrs. Allen and Hanburys, who hope to have it available immediately.

It consists of a strong japan-enamelled metal case with attached hypodermic syringe (in separate metal spirit-proof case), and contains four compartments holding rubber-capped bottles of hypodermic solutions. The over-all measurements of the case are approximately 6 in. by 3 in. by 1½ in. It may be carried in a coat pocket, but is also provided with lugs to take a shoulder-strap and a strap round the chest, the latter to prevent swinging and banging when crawling over debris etc.; moreover, the straps leave both hands free. The case opens on a hinge, and when it is open the four bottles and the syringe are all upright. The rubber caps of the bottles are further protected by screw-on covers, but it is recommended that these be removed (and left behind or pocketed) and the rubber caps wiped over with spirit before the outfit is taken to an incident.

The syringe case is attached to the outfit by screw clips and can be removed or changed at will, but cannot fall loose its cover can be removed without detaching the case. A chain connects the cap of the syringe case to the body of the case to prevent the cap from being lost or from requiring to be



held. (This is not shown in the illustration.) There are also two spare needles held in the case of the outfit by a clip. The solution bottles are held from slipping or falling in any circumstances, but finger-holes in their containing compartments allow of their easy removal when desired.

The solutions carried may be varied according to individual judgment, and the makers are preparing a range of these of standardized strengths. My own suggestions are: (1) morphine sulphate, 1/3 grain per c.cm.; (2) omnopon (or allopon) 1/3 grain with hyoscine 1/150 grain per c.cm.; (3) coramine, or similar analeptic; and (4) either strychnine 1/30 grain per c cm., adrenaline hydrochloride, or morphine sulphate 1/6 grain per c cm. (for children). The solutions being standardized and the syringe a 1.0 c.cm. Record, one syringeful, even in the dark, is one standard dose. The No. 2 solution of omnopon (or allopon) with hyoscine was suggested to me by Dr. J. E. Piercy of the New End Hospital, Hampstead. He recommends it for use in cases where pain and shock exist together and early surgical treatment may be required. The pain will be relieved by 1.0 c.cm. without the drop in blood pressure that usually follows heavy doses of morphine and, if necessary, injection may be renewed after two hours to control return of pain or restlessness without unfitting the patient for an anaesthetic. One caution is necessary: the doctor must either memorize the positions of his bottles, or, if he marks them with luminous paint, must expose the paint to light occasionally. Of course, the bottles may be marked with raised or embossed labels.

A patent has been applied for.

MICHEL SKIN CLIPS

The metal skin clips designed by Dr. Paul Michel, and known by his name, were originally made in France and afterwards in Germany. They have for many years past been used throughout the world for closing skin incisions, and now that the supply of the original make has been cut off Allen and Hanburys have installed the necessary tools and machinery for their manufacture in this country. The material of which they are made is exactly the same as that of the original French clips, and all sizes, 12, 14, 16 and 18 mm., are available.

The improved Michel clips known as Kifa skin clips were originally of German manufacture, though marketed by a Swedish house. Allen and Hanburys have installed machinery for these also and they are now available.

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DEVELOPMENT OF THE MALIGNANT TUMOUR

Recent studies of the genesis of cancer show that the process is often more gradual than was once thought, and that its real beginnings lie far back in what has usually been regarded as a precancerous period of wholly non-specific hyperplasia. This is seen most clearly from a series of ingenious experiments described in papers from the Rockefeller Institute, one by Rous and Kidd[1] and the other by MacKenzie and Rous[2]; and support is forthcoming from other recent and earlier studies. The Rockefeller workers, using the rabbit's ear, have again investigated the beginnings of tar tumours. They find that if painting is completely discontinued at the end of a month or so, no changes are seen beyond a slight non-specific inflammation, and perhaps here and there the suggestion of an early papilloma. Soon these disturbances subside, and, in the absence of further treatment, the ear will thenceforth remain free of papillomas; yet some of the epithelial cells have already received that special, specific, and irreversible bias which determines that when favourable conditions arise they or their descendants will become cancerous. If within a few weeks or months the painting process is renewed, thus providing the necessary favourable conditions, some of these biased cells now proliferate and form papillomas; this occurs even in areas where no sign of papilloma has previously been found. The abnormal tendency to multiplication and tumour formation shown by the affected cells is still dependent on the continued presence of the tar; if the tar is withdrawn the papillomas steadily dwindle, until ultimately even microscopical examination may fail to reveal any persisting tumour cells. If the tar is applied once more one or several of the papillomas may again appear. The successive disappearance and reappearance of a particular papilloma may be demonstrated in this way, but each time it reappears more promptly and becomes quiescent more slowly. Stroma changes, too, are more persistent. Eventually there is no retrogression even if tarring is completely stopped: the exhibition of the cancerous tendency no longer depends on coexisting favourable conditions, and the cells are obviously malignant.

Not all papillomas follow this course. Many disappear by the way, many appear late, and some pass more directly into the fully cancerous condition. Cells vary among themselves, and at any one time those in different parts of a papilloma may show different degrees of malignancy. Rous and his colleagues are struck, first, by the occurrence of these latent cancerous cells, indistinguishable from normal cells; and, secondly, by the continuity of the transition from these normal-looking cells up to the most malignant. If the tarring goes on indefinitely there is, according to the typical process visualized by Rous and his colleagues, an orderly progression by imperceptible stages. This same feature of gradualness or continuity has impressed Sir Robert Muir in his recent study of the development of human breast cancers.[3] He describes how, in those relatively few cases in which he could be sure of the facts, a single and continuous process is seen. This moves from the simplest recognizable hyperplasia of the epithelial lining of mammary duct or acinus, through various stages of increasing disorder of growth, on to the frankly malignant condition, and thence to the completely unorganized and anaplastic state. In the Shope skin papilloma—a virus disease of rabbits—there is a similar continuous trend from the early benign wart through stages less well organized to evident neoplasia and even, as before, to the completely unorganized state. This gradual transition appears to be characteristic of epithelial cancers in general and possibly of all malignant disease, though it must be recognized that the genesis of sarcomas is difficult to study, and often, even in cancers proper, the intermediate stages seem to be more or less completely telescoped. Thus the view emerges that the point which in practice is taken as the end of the precancerous period does not mark the initiation of some essentially new and novel process in the cell. It is simply the point at which the tendency to cancer has become so strong that it can no longer be overcome by ordinary bodily reaction. This seems the most reasonable explanation of the apparently critical nature of the end-point of the precancerous period. Rous and Kidd, however, take a slightly different view. They insist on the neoplastic nature of cells in the precancerous period, but think that progress towards unmistakable malignancy occurs in a sequence of numerous steps rather than in a truly continuous manner, the step at the end of the precancerous period often being more abrupt than the others and possibly different.

The experiments of Rous, Kidd, and MacKenzie bring the question of latent cancer again into prominence. It is shown, as explained above, that epithelial cells already capable of producing tumours when given the opportunity may lie quiescent for long periods—six months at least. It is shown also that during this time the quiescent cells are exactly like the corresponding normal cells in both behaviour and histological characters. In this quiescent state they display no invasive qualities, and they are entirely subservient to the needs of the body. They may, for instance, take part in a reparative process and, multiplying, may spread over an adjacent injured area to form a new epithelial covering. The latent capacity to form tumours in favourable circumstances is greater in some cases than in others, and the capacity is transmissible to daughter cells. This has not been proved for sarcomas; but we are faced with the possibility—probability, in fact—that scattered here and there throughout the body there are from time to time quiescent cancer cells ready to flare up into malignant tumours under certain conditions. In some such cells, to judge from the tar experiments, the quiescent state may always have existed; in others it may have supervened only after a period of tumour-forming activity. In human beings the great majority of tumours are already malignant when first observed. They are simply those tumours which, by the activity of the carcinogenic process, or owing to favourable conditions, have survived to attain full independence. For every one of these, if the tar experiments can be

[1] *J. exp. Med.*, 1941, 73, 365.
[2] *Ibid.*, 73, 391.
[3] *J. Path. Bact.*, 1941, 52, 155.

taken as a guide, a multitude must have perished by the way, and there may be some cancerous cells still lying inert. Not so very different, perhaps, are those cells which, derived from clinically observed cancers of human beings, remain indolent over a long period. This must be the case, for example, when metastases light up and are noticed years after the primary tumour has been excised.

MacKenzie and Rous stress the need for distinguishing clearly between factors which cause the primary cancerous bias in cells and those which enable biased cells to manifest their carcinogenic capacities. In tar the two factors are combined: tar initiates the cancerous change, and also provides conditions under which fully malignant growths may come into being. But the two factors are not always thus closely associated. It is possible, for instance, that there may be carcinogens which, when acting alone, fail to produce tumours because they cannot fulfil the second function mentioned; but of such carcinogens nothing is known. Of the other possibility—namely, that some factors exist which are capable only of unmasking the cancerous tendency of already biased cells—we know a little more. In the experiments of Rous, Kidd, and MacKenzie it is shown that epithelial cells which have developed an initial cancerous bias before tarring is stopped, and which have afterwards become quiescent, may flare up and become manifestly malignant if painted with turpentine or when involved in the repair tissue of a healing wound. Neither turpentine nor trauma will of itself produce tumours in normal skin. Deelman observed long ago that the repair of wounds in the tarred skin of mice was often accompanied by the appearance of papillomas and carcinomas at the healing edge of the new scar. Clinical pathologists know that bacterial infection may stimulate tumour growth and increase malignancy. Surgeons sometimes observe that excision of cancers from an expanse of irradiated human skin is followed by the development of a wholly new malignant growth in the healing edge of the wound. Injection of Scharlach R into a benign Shope papilloma may delay regressive changes. The factors so far known to favour increase in malignancy seem all to be associated with inflammation and fibroblastic proliferation. Perhaps the factors discussed above are rather different from those which, attributable to the host, may exert an influence even on frankly malignant cells and so play a part in determining the histological picture.[1] More knowledge is needed on this. Information is also required on the opposite set of conditions—that is, on those bodily factors which tend to prevent the latent cancer cell from multiplying and proceeding to tumour formation. Should it be possible to utilize or enhance the action of these factors, then it may be hoped we shall be in a position to tackle even the more malignant of established tumours.

The observation that cancerous cells can lie dormant and then rapidly become malignant as a consequence of traumatic or other stimuli—never before so clearly demonstrated as in these experiments of Rous and his colleagues—has obvious medico-legal significance. They support the belief that trauma—a fracture, for instance—may provide conditions favourable to the rapid appearance of a clinically observable malignant tumour, and thus, in a legal sense, be a cause of tumours.

But with all these discoveries the essential cause of cancer remains elusive. The specific abnormal tendency to cell multiplication is the basic phenomenon and the substrate on which the various accessory factors operate. We still seek for what lies behind this specific change in cellular activity; and, notwithstanding greater histological and biological knowledge of precancerous and later stages, it is still not possible to visualize the state of affairs in the cell itself. The development of a typical or "textbook" example of cancer is now seen as a continuous and single process extending through the precancerous period and into the period of obvious malignancy. If this view is accepted, and it seems it must be, the outstanding feature is the continuity of the process, the smooth transition from one phase to the next. A long and orderly succession of cell mutations such as would give the required apparent continuity is improbable, and a similarly orderly series of consecutive mutations of a virus seems little more probable. In the absence of direct knowledge of the significant intracellular conditions, discussion of this aspect of the cancer problem is unprofitable. But we are now on a different footing in regard to the initiation of cancerous change. Applications of tar to the rabbit skin result in the appearance first of papillomas and then of carcinomas, and the same holds good for the Shope virus. In one sense, then, both tar and virus may be causes of cancer. The remarkable feature of recent studies is that, with widening knowledge of these two rabbit papillomas, the parallel between them becomes more and more close. Thus in both there is the same increasing disorderliness of growth as the fully malignant stage is approached. Even the occurrence of latent cancerous cells seems in no way peculiar to papillomas induced by tar, for papillomas caused by Shope virus occasionally reappear spontaneously at spots where they have once vanished. Evidently the cancerous condition is the same, whether apparently caused by a physical agent or by a virus. The problem of the moment is whether a virus is present in tar tumours (a reasonable question, as Shope virus, though not directly demonstrable, is known to persist indefinitely in transplanted Shope cancers), or whether there is some other unifying principle to be discovered.

[1] *Amer. J. Cancer*, 1940, 39, 1.

THE EFFECT OF MALARIA ON THE BIRTH RATE

The dominant part played by malaria as a cause of mortality in tropical and subtropical countries is often stressed. It is not so commonly recognized how difficult it is to determine, even approximately, what is the actual mortality due to malaria. One reason for this difficulty is that malarial mortality in indigenous populations of tropical countries is mainly displayed as raised infantile mortality. Hence statistics rarely help us, for a raised infantile mortality is obviously very difficult to analyse into its components. The effect of malaria is not, however, confined to post-natal mortality, for death of the foetus in the form of stillbirths and abortions is a pronounced feature of this disease, and here statistics very rarely give us any information. It is, however, very generally assumed that these antenatal effects, coupled very probably with reduced conceptions, are displayed in a lowered birth rate which is supposed to exist under malarious conditions in a complementary manner to the raised death rate. Nevertheless a number of observers investigating malaria in such circumstances have recorded their opinion that

the birth rate is not lowered and may even be increased. This curious anomaly has never been satisfactorily explained, and the whole question of the birth rate in malaria is a subject regarding which almost nothing is known. Yet it is vitally important, since the relevance of the birth rate to questions of the decay of populations, depopulated tracts, and backward races, as well as to the question, now often raised, of overpopulation, should certain important diseases be effectively controlled, is very evident. It is satisfactory, therefore, to note the recent publication by Colonel C. A. Gill of the results of a very complete and careful statistical inquiry into the influence of malaria on the birth rate, with special reference to Ceylon.[1]

Ceylon has been chosen for the investigation because in the first place the vital statistics of Ceylon are unusually accurate and complete, and, further, Ceylon includes within relatively restricted limits a great variety of malarial conditions. Not only has this island, as many may remember, suffered in recent years from a severe manifestation of epidemic malaria, but it shows sharply defined zones of various degrees of endemic malaria, including non-malarious areas, areas of moderate endemicity, and areas of hyperendemicity. This latter type of malaria is a condition in which the whole population is exposed to such intense malaria that a sort of equilibrium becomes established between intensity of infection and immunity, the brunt of the impact falling especially upon those in the first decade of life, who, as a result, develop an immunity during childhood which enables the adult population largely to escape. The island therefore offers exceptional conditions for such a study as that undertaken by Colonel Gill. The actual facts regarding the effect of malaria on the birth rate were found to be complex, depending on the type and degree of malaria and the nature of the population. In the five zones delimited and numbered by the author according to increasing malarial intensity as shown by the spleen rate, the death rate, both actual and standardized, and the infantile mortality rate progressively increased by substantial increments *pari passu* with increase in the zonal spleen rate. On the other hand these conspicuous changes in the death rate are not associated with any marked change in the zonal birth rate, whether actual or standardized. A study of the corrected birth rate month by month, however, revealed that in Zone 1, the non-malarious zone, births showed a large wave of increase from October to March, with a small increase in May, which may be termed the "spring wave." In the other zones, all more or less affected by malaria, this normal distribution is altered, there being evident a decrease in the October to March wave and an increase in births from April to September. It is this effect due to reduced conceptions, stillbirths, and abortions during the malaria season, thereby liberating, so to speak, more wombs for renewed conceptions in the remainder of the year, which is, according to the author, the characteristic effect produced on the birth rate by endemic malaria. The total birth rate is not reduced.

These findings, the author is careful to explain, relate to the corrected birth rate and assume stable populations. They do not apply, for instance, to a community such as Europeans or other non-immunes, who do not represent the same relation to malaria as do the indigenous inhabitants. Also, indirect conditions brought about by malaria may greatly affect the crude birth rate—for example, in the case where, due to economic effects brought about by malaria, there has been an emigration of those of child-bearing age. Since epidemic malaria occurs only in populations not subject to a high degree of endemic malaria, there is a reduction in the birth rate due to stillbirths, abortions, and reduced conceptions, but this is temporary. That these conditions are not peculiar to Ceylon is shown very strikingly by the observations of Kenrick in Central India, referred to by Colonel Gill. Here, although no explanation is given, statistics based on thirty-three hyperendemic villages with a mean spleen rate of 80%, compared with those of thirty-four villages with a mean spleen rate of 4%, show that the monthly distribution of births in malaria-free ("healthy") districts of the Central Provinces is characterized by a large wave of enhanced births in the autumn, whereas in the hyperendemic area this wave is almost absent and is replaced by a conspicuously large wave in the spring. The mean birth rate of these two groups of villages was respectively 45.6 and 44.6 per mille.

Colonel Gill's results are of interest not only as a much-to-be-desired investigation of an important subject, and as explaining the seemingly contradictory evidence of different observers in regard to the effect of malaria on the birth rate, but also as emphasizing the value of well-organized registration of vital statistics in tropical possessions. Unfortunately not many of our colonies in the Tropics reach the high level of Ceylon in this respect.

[1] *J. Malaria Institute of India*, 3, September 2 and 3, 1940, p. 201. Calcutta: Hacker's Press and Directories, Ltd.

BLOOD CLOTTING

During the last seven years there has been a considerable change in views on blood coagulation. In 1934 the position could be summarized thus: when clotting occurs an enzyme converts fibrinogen to fibrin; the thrombin is formed from prothrombin; tissue injury initiates clotting; free calcium ions are essential; and, finally, platelets appear to play a part. Of all these, the blood calcium was clinically the most important, because by the use of citrate or lactate the clotting time might be lengthened or shortened. Since then the position has altered in a number of ways. In the first place some of the elements involved have been obtained in a pure state—notably heparin in Canada by Best and Scott[1] and in Stockholm by Jorpes,[2] and prothrombin and thrombin by J. Mellanby[3] in England. Secondly, there has been the work by Dam[4] in Copenhagen and by Almquist[5] in U.S.A. on the nutritional factor now called vitamin K. Thirdly, emphasis has been laid on the ether-soluble factor by J. Mellanby and Leathes.[6] How blood clotting takes place has been removed from the realm of speculation to that of reasonable certitude. The Morawitz-Fuld hypothesis, modified by Mellanby, is now widely accepted. According to this, thrombin is formed from prothrombin by the joint action of thrombokinase and iodized calcium. The latter is, however, necessary only when plasma or whole blood is being clotted, and not if purified reagents are used. Thrombokinase is formed from the injured tissue, and it is also found in certain snake venoms[7]—for example, Russell viper. In building up this theory Mellanby devised the technique which led to the isolation of prothrombin and thrombin. As a result of this work and the emphasis he laid upon the importance of prothrombin as a normal circulating component of the blood, methods were devised of estimating it at least relatively, such as those of Quick,[8] modified by Reid[9] and by Innes and Davidson.[10]

There were two reasons for this emphasis on prothrombin. First, as the immediate precursor in the blood of the active enzyme, prothrombin became the deciding factor in determining the duration of the change of fibrinogen to fibrin—calcium ions and thrombokinase both being mere fulminators and usually present above their minimal quantities. The second reason was that the vitamin K of Dam was found to act by stimulating the liver to manufacture prothrombin.[11] Apparently prothrombin is normally made by the hepatic tissue. This manufacture depends on two things at least: integrity of the liver structure and a steady supply of vitamin K. The latter has been identified as a naphthoquinone derivative, but certain synthetic derivatives have been shown to have the same action.[12 13] If these substances are administered by the mouth or eaten in the food they are absorbed. Vitamin K is most plentiful in green leaves such as spinach and cabbage, certain bacteria, and in egg-yolk and liver. Absorption of the vitamin is dependent on the presence of bile salts in the intestine.[14] Consequently biliary obstruction is associated with deficient absorption of vitamin K, and so with deficient manufacture of prothrombin. It can best be treated either by giving vitamin K plus bile by the mouth, or by injecting vitamin K or a suitable synthetic derivative alone.[15] The latter procedure is preferable. Under these conditions the effect is controlled by observing the prothrombin time, which is the coagulation time of plasma or blood in the presence of excess of calcium and thrombokinase. The relation shown between the degree of liver damage and biliary obstruction and the coagulation time of the blood, and the possibility of restoring the latter to normal, have enabled the surgeon to avoid post-operative haemorrhage as a possible cause of death.

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CAUSTIC PASTE FOR CANCER

One of the earliest means of treating cancer was by the use of chemical caustics applied to such growths as could be reached from the surface. Indeed it is probable that this method is still used by unqualified "cancer curers" in remote places. Dr. F. E. Mohs[1] of Madison, Wisconsin, believing that there were certain virtues in the method, has elaborated it and placed it upon a controlled scientific basis. His experience, following a prolonged experimental laboratory investigation, now extends to over 600 cases. It is obvious, therefore, that his work is not to be ignored through mere prejudice against a treatment which has been abused in the past. Briefly the method consists in the application of an escharotic agent to the surface of accessible cancers for a predetermined time, usually twenty-four hours. The "fixed" tissue is then excised surgically and careful microscopical examination is made of frozen sections. A map is then prepared of the exposed area, and the regions where cancer is still present are again treated with the agent. After a further twenty-four hours the "fixed" zones are again excised and examined microscopically. This process is repeated until a completely non-cancerous plane is reached. The raw area now remaining is allowed to close in, and, with the aid of an epithelial proliferant, closure is said to be surprisingly rapid, the resulting scars being soft and pliable. The particular agent used has been the subject of much experiment. The following formula is the one now recommended: stibuite (as a granular permeant of mineral origin) 40.0 g., *Sanguinaria canadensis* (as an organic agglutinant) 10.0 g., zinc chloride (saturated solution) 34.5 c.cm. Dr. Mohs's article is illustrated by photographs showing the progress and final results of cases of squamous carcinoma of the lips, ears, eyelids, and face, rodent ulcers of the orbit and nose, carcinoma of the parotid, and a basal-celled growth of the anus involving the rectum and buttock. The results certainly look impressive. It is strongly emphasized that the method is suitable for use only in well-equipped clinics under systematic microscopical control. Without personal trial it will be difficult for surgeons to assess its value, and as most of the growths for which the treatment is suitable are radiosensitive it is doubtful whether many will feel inclined to abandon the proved value of *x* rays and radium for a method which is more tedious and destructive. Diathermy, too, is a somewhat similar method of treatment, though microscopical examination of the heat-coagulated tissues requires very special experience if it is to be of value. A point of much importance which emerges from these studies is the frequency with which apparently superficial rodent ulcers in the region of the eyelids extend deeply along the walls of the orbit. This is a fact sometimes not fully appreciated when other forms of treatment are used.

1 *Arch. Surg.*, 1941, **42**, 27

ELECTRO-ENCEPHALOGRAMS OF PROBLEM CHILDREN

The usefulness of encephalography in the study of epilepsy and in the location of tumours has been widely recognized. The association of abnormal waves with other neurological and psychiatric affections, however, has not yielded such definite information. Lindsley and Cutts[1] consider that more detailed and more quantitative analysis of the records is required, as well as standardization based on the examination of large numbers of normal persons. They have investigated four groups of persons: thirty-six normal children of good health and, as a group, above average intelligence; thirty upper-class university students; fifty behaviour problem children; and thirty "constitutionally inferior" children, wards of the State and unplaceable in foster homes. Records were taken from four regions of the head and analysed in accordance with a standard procedure. The behaviour problem children as a group differed markedly from the normal children. Far more of the former exhibited slow waves, below 8 per second. For example, 2 to 5 waves per second occurring during 10% or more of the time were about three times as common in the behaviour problem children as in the normal children. The former also showed a much higher incidence of waves of 5 to 8 per second for 10% or more of the time. The numbers exhibiting higher rhythms did not differ appreciably in any of the four groups. The "constitutionally inferior" children were intermediate. They resembled the normal children in showing few frequencies of 2 to 5 waves per second, and the behaviour problem children in exhibiting a high incidence of waves of 5 to 8 per second (of children showing these frequencies, five were reported to present definite behaviour problems). A "hyperventilation effect" is sometimes produced by overbreathing; this is a continuous series of slow waves or repeated bursts of such waves at irregular intervals. This effect was more often found in the two abnormal groups, and it appeared earlier and persisted longer in the problem children than in

1 *Arch. Neurol. Psychiat., Chicago*, 1940, **44**, 1199.

any other group. This is interpreted as a lower threshold of cortical excitability and a greater sensitivity to disturbances arising in the cortex. The authors conclude that the disturbances of cortical function indicated by the slow waves are probably important factors in the causation of behaviour disorders. They promise a further and more detailed analysis of the clinical records and the electroencephalograms of the problem children. It is to be hoped that the neurological approach to difficult cases, which are usually discussed in purely psychological terms, may lead to clarification.

ANTISEPTICS AND THE BRAIN

There has been a revival of interest and even belief in antiseptics since the war began, and most surgeons are willing to admit that they have some value in both the prevention and the treatment of wound infections. This change of attitude is largely due to the remarkable successes achieved by the local application of sulphonamide compounds in solid form, but its effects have embraced other more or less non-toxic substances, particularly flavine compounds and other dyes, which are now being used more freely, more hopefully, and, perhaps it may be said, more intelligently than in the past. The main objection to applying antiseptics to wounds has always been that they may do more damage than good, and of some of the older ones, such as cresol solutions and mercury salts, this is certainly true. About the effect on exposed tissues of other antiseptics which are neither grossly caustic nor protein precipitants, but are generally supposed to cause some cell damage, too little is known. There is some information based on tissue culture studies and observations on the behaviour of leucocytes *in vitro*, but the crucial test is obviously to apply the antiseptic to an experimental wound and to observe its effect either by histological study or by carefully controlled estimation of the rate of healing. A welcome example of this method of direct investigation is the work of Dorothy S. Russell and Murray A. Falconer,[1] which deals with an important special case—namely, the effect of antiseptics on the brain. They exposed the surface of rabbits' brains and applied antiseptics to them simply by placing a piece of material soaked in the solution in contact with the cortex for ten minutes; in some experiments such material was introduced into a linear incision, or a small amount of solution was injected beneath the cortex. The wounds were then closed and the animal was allowed to live for a period of from one to eight days before the effects of the treatment were examined. From the results as a whole it is clear that the brain is easily damaged; distilled water causes extensive necrosis, and it is evident from experiments with various solvents that any solution applied to the brain should be isotonic, preferably buffered, and neutral in reaction. Most of the antiseptics tested, including those which we are accustomed to regard as relatively non-toxic, produced a severe haemorrhagic necrosis, the illustrations of which, both gross and microscopic, have a highly forbidding aspect, suggestive rather of the effect of a cautery or strong caustic, except that the lesion extends even more deeply. The solutions producing these disastrous results were 0.1% acriflavine however dissolved, 5% dettol in distilled water, azochloramide in triacetin, and eusol. Dettol and similar reagents in buffered saline, organic mercurial compounds, and hydrogen peroxide were somewhat less destructive. The only antiseptic free from these effects, and indeed scarcely distinguishable in its action on the brain from the isotonic buffered saline in which it was dissolved, was 0.1% proflavine; this innocuous quality was approached by another closely related compound, 2:7-diaminoacridine. These are therefore considered to be the best antiseptics among those tested for purposes involving application to the brain.

The contrast between acriflavine and proflavine is striking and unexpected. It should perhaps be more widely known that acriflavine is not a pure substance, but a mixture the composition of which is not constant; its chief advantages are greater solubility and the fact that much of the work on flavines, both clinical and experimental, has been done with it. That it should be so destructive to the brain is surprising, since it has repeatedly been found that leucocytes retain their motility and continue phagocytosis in bactericidal concentrations of it. Discrepancies and disagreements about its properties in the past are attributable partly to the varying properties in different samples. But another factor which must certainly be considered is the varying susceptibility of different tissues to chemical damage. It is a matter of everyday observation that acriflavine solutions do not cause haemorrhagic necrosis, or anything like it, in skin or connective tissues While these findings are of the utmost importance for cerebral surgery, and while an isotonic proflavine solution would probably be equally innocuous in other parts of the body, it should not be assumed that the other antiseptics tested are to be condemned for use elsewhere. A similar study of the effects produced in connective tissue and muscle might yield results less dramatic and more difficult to evaluate, but of equal if not greater service to surgery generally.

[1] *Brit. J. Surg.*, 1941, 28, 472.

THE R.M.B.F.

The accounts of the Royal Medical Benevolent Fund for 1940, just issued, show that the total income, a little over £36,000, was some £5,000 more than the figure for 1939. This increase, however, is entirely accounted for by an adventitious increase in the amount received under legacies, which amount is transferred to the capital funds. Subscriptions and donations have fallen by some £600. On the other hand, although the amount expended in gifts has increased to £15,300 from £14,700, annuities are lower by £1,000, and social service and administrative expenses and expenses on appeals and publicity have been much reduced. In a circular issued to subscribers and donors by Sir Arnold Lawson, the chairman of the Committee of Management, it is pointed out that the economy in working expenses—an economy effected by reduction of staff and non-publication of a full annual report—must be largely counterbalanced by the limits which it imposes on the ability of the Fund, by advertisements and appeals, to keep its needs permanently before the medical profession. In the absence of widely issued appeals the committee places the future progress of the Fund in the hands of its regular subscribers, who, it is hoped, will act as living advertising media. The book value of the Fund's investments stands at just upon £220,000. In the circular letter, which was issued before his death, a tribute is paid to the late Sir D'Arcy Power, who on account of failing health resigned the chairmanship of the Committee of Management, a post he had held for over nine years. The address of the R.M.B.F is now 1, Balliol House, Manor Fields, Putney, S.W.15.

The Trustees of the Lady Tata Memorial Fund announce that, on the recommendation of the Scientific Advisory Committee, they have agreed, if circumstances permit, to make the following awards for research in blood diseases, with special reference to leukaemia, in the academic year beginning on October 1, 1941. Grants for research expenses: Dr. J. Furth (New York); Dr. P. A. Gorer (London); Dr. A. H. T. Robb-Smith (Oxford). Part-time personal grant and grant for research expenses: Dr. W. Jacobson (Cambridge).

CHEST SURGERY IN WAR

This is one of a short series of articles based on lectures given at the British Postgraduate Medical School, Hammersmith

GUNSHOT WOUNDS OF THE HEART

BY

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It is interesting to realize that though wounds of the heart are fatal in the great majority of instances there is undoubtedly a residue of cases, small though it may be, which recover.

In warfare a wound of the heart is seldom an isolated lesion, and is often accompanied by serious damage not only to the thorax but to other parts of the body. In 1920 the late Sir George Makins reviewed the specimens of gunshot wounds of the heart which had been brought together in the War Office Collection at the Royal College of Surgeons. These specimens showed that the heart may be almost blown to pieces or very severely lacerated, and that missiles may pass through the viscus to be lodged elsewhere or be retained in the auricles, in the ventricles, or in the walls of these cavities. Like all war wounds, some are apparently aseptic while others are associated with the severest forms of infection. Since the war of 1914-18 many cases have come to light in which missiles have been retained in the heart and the patients have not only survived but have been able to pursue more or less normal activities years afterwards. Injuries less easy to detect, like bruises, contusions, and superficial lacerations of the heart wall, probably also occur in warfare from bursting bombs, etc, but without external wounds. Such trauma must sometimes be the cause of temporary or even permanent disability.

H. Ryerson Decker (1939) was able to review no fewer than 100 cases in which foreign bodies had been retained in the heart of surviving patients, and of these 65 were either bullets or fragments of shell. In most of these cases the stage of infection had passed and the foreign bodies were located by *x*-ray examination, often long after the casualty. When it has been possible to examine the seat of the lesion at operation or at necropsy the foreign bodies have usually been found safely surrounded by a barrier of strong fibrous tissue (Coutéaud and Bellot, 1914-15), and sometimes with a collection of fluid round about them. The causes of death on the field or soon afterwards are the great severity of the injury, shock, or haemorrhage; and under haemorrhage comes the question of cardiac tamponade. Later deaths are due to sepsis, to embolism, or to associated injuries.

Acute Cardiac Tamponade

Cardiac tamponade is a most interesting condition, but for the moment we are only concerned with the acute variety. In many cases of gunshot wound the missile seems to penetrate the wall of the heart without causing haemorrhage, while in others there is free bleeding. If the blood cannot readily escape from the unyielding pericardium this sac becomes rapidly distended and the volume of the accumulating blood exercises pressure on the veins and, later, on the walls of the auricles. In this way the cardiac action is embarrassed and finally arrested. The rate of development of the tamponade depends on the size and situation of the wound of the cardiac muscle and the ease with which the effused blood can escape, either externally or into the pleural cavity. The symptoms are quite characteristic. After a latent interval of varying duration, which may be as short as ten minutes, the patient complains of oppression at the heart and of fear, and is uncontrollably restless. The countenance, at first pale from shock, becomes cyanosed, the body surface is cold and there is profuse perspiration, while the big veins at the root of the neck are overdistended. The quick pulse becomes irregular, and as the heart falters its beat becomes fluttering in character. Naturally the blood pressure is low and rapidly falls as the patient sinks into unconsciousness. Examination reveals the signs of distension of the pericardium, as shown by the greatly increased dullness, while the heart sounds are muffled and obscure. The condition is rapidly fatal, therefore it must be recognized promptly if effective aid is to be given. The essential step is to open the pericardium freely so that the accumulated blood can escape: the heart requires living room and must be immediately decompressed. Cokkinis says: "Every patient who reaches the theatre with the least evidence of cardiac function should be operated upon, as even in the most desperate case the compressed heart may revive immediately the pericardium is opened."

Of course, if after the release of the intrapericardiac tension the bleeding continues the heart must be exposed in order that the wound may be sutured; for preservation from one sort of haemorrhagic death will bring no credit to surgery if the patient is to succumb from another. Though merely to enlarge an entrance wound may save death from tamponade, it is so likely to be necessary to deal with the wound in the heart itself that the surgeon should be prepared to carry on there and then with the complete operation. The technique to be employed is described below.

Diagnosis of Heart Wounds

The diagnosis of wounds of the heart is suggested by a situation near the cardiac area, but in many cases the wound of entrance has been in the lateral wall of the chest, in the axilla, or even through one or other upper extremity. With a missile impacted in the heart there is very often no characteristic disturbance, and the suspected diagnosis can only be confirmed by radiography. But even the radiograph may be deceptive, for foreign bodies in the pericardium frequently reveal a pulsation which is merely communicated. The only thing to do is to accept the probability of a heart wound when a missile has entered within the cardiac area and not to overlook the possibility with wounds in other situations. The exact diagnosis of the position of the missile will usually be a matter for a subsequent and more detailed investigation. But another type of case occurs in which the wound has destroyed some part of the parietes and there is a direct and obvious communication between the outside and the heart. These open wounds are not necessarily the most grave. Generally speaking, wounds from shell fragments are more serious than those inflicted by bullets, and this is largely due to the common association of sepsis with shell wounds.

Emergency Treatment of Shell Wounds

Perhaps it is better at this stage to deal with the treatment of such wounds as are obvious emergencies; these include the open wound from shell fragments as well as the wound in which cardiac tamponade rapidly

develops. In the open wound the indications are to arrest haemorrhage, to treat shock, and to anticipate sepsis These indications can be met by approaching the matter as with wounds in other situations, and it will be necessary to excise the wound in the parietes, to inspect the heart, to suture any laceration in the viscus which is bleeding, or to remove a foreign body that is easily accessible. Foreign bodies that are deeply embedded in the heart wall or are lying in the heart cavities are probably best left alone at this stage The temptation for the surgeon to go on is very strong, but, generally speaking, deaths are not due to the mere presence of the foreign bodies, and if the patient survives the risks of haemorrhage and sepsis the problem of the foreign body n be considered with deliberation later In this sort f case it is probably wiser to provide for drainage of he pericardium by tube or rubber tissue, which may afely be placed in the lowest part of the sac or even up behind the heart.

Many of those who have recorded otherwise successful interventions in gunshot wounds of the heart have had to regret late deaths from infection and have sometimes expressed the conviction that drainage might have staved off disaster (Ballance). The local use of some antiseptic will follow the practice that may be in vogue at the time, for the heart and pericardium are quite capable of withstanding such treatment The resources of chemotherapy may be most valuable.

The Best Method of Exposing the Heart

The wound of the parietes may be sufficiently extensive to give access to the interior of the pericardium and the injured area of the heart. As a rule, however, these wounds are not big enough to enable the necessary manipulation to be carried out, and some deliberate method of exposure must be adopted If the pleural cavity is already opened the original wound may be freely

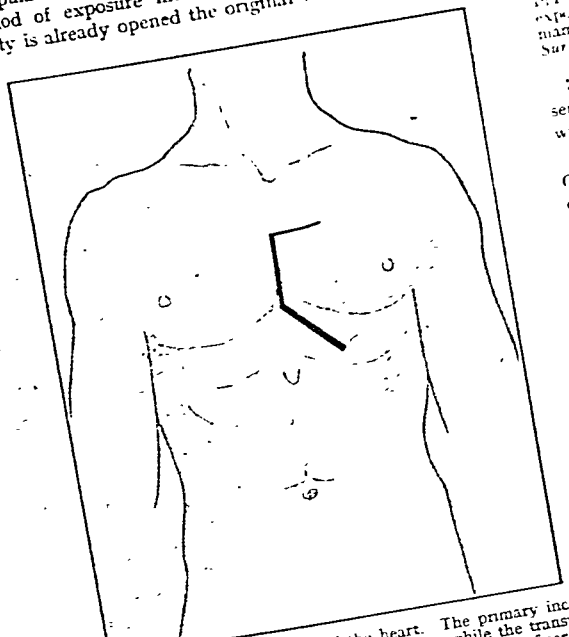


FIG. 1.—Incision for exposure of the heart. The primary incision along the sixth rib is indicated by a broad line, while the transverse cut along the third (or second) rib is represented by a finer line. (Modified from *Textbook of Operative Surgery*, by Theodore Kocher.)

enlarged along the line of a rib. By "spreading" such a wound and enlarging the tear in the pericardium a sufficient exposure may be obtained. But when the pleura is intact it is much better that it should remain so, and in these circumstances the parasternal exposure of Theodore Kocher is very satisfactory. The steps of this operation are as follows:

1. Incise from centre of sternum along the sixth costal cartilage as far as the mammary line.

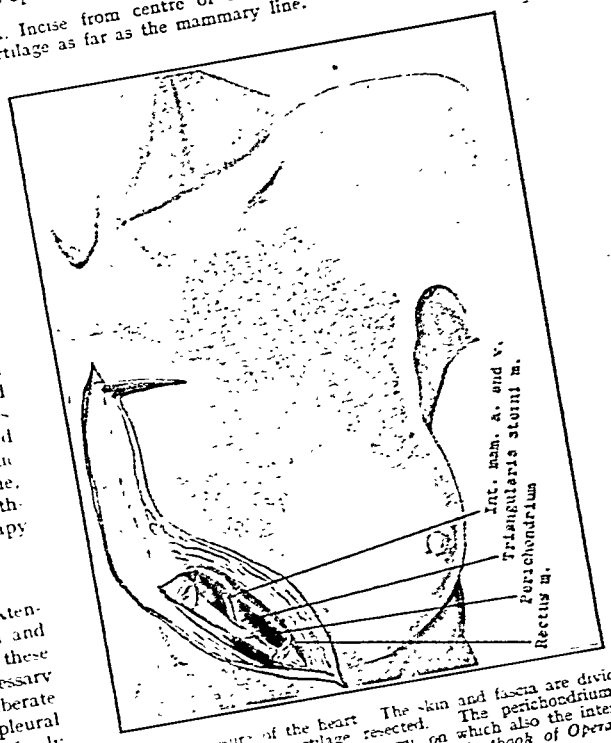


FIG. 2.—Exposure of the heart. The skin and fascia are divided and the sixth costal cartilage resected. The perichondrium is exposed lying on the triangularis sterni, on which also the internal mammary vessels descend (Modified from *Textbook of Operative Surgery*, by Theodore Kocher.)

2. Separate the perichondrium and excise the cartilage. The separation should be begun at the sternal end, the junction with the seventh cartilage being divided.

3. Divide the triangularis sterni muscle close to the sternum. Gently thrusting this muscle outwards will carry the pleura out of harm's way and will expose the pericardium.

4. Open the glistening pericardium either now or at a later stage

5. To secure more room make a vertical incision over the middle of the sternum to the level of the third or even second rib, and a short incision along this rib cartilage

6. Separate the structures from the front of the sternum outwards until costal cartilages are exposed.

7. Divide the fifth, fourth and third cartilages at their inner ends.

8. Lift up the flap of the chest wall with a view to turning it back. Do this slowly and gently, pushing the pleura outwards as the cartilages are lifted

9. Break the cartilages at their junction with the ribs thus exposing a considerable area of pericardium.

10. Open the pericardium along the edge of the sternum and, if necessary, outwards at the lower edge of the exposure.

11. To secure further space use rongeur forceps to cut away the remains of the sternal ends of costal cartilages and, if required, part of the edge of the sternum.

The steps of the operation are shown in the illustrations (Figs. 1, 2, and 3).

The transternal route—splitting the sternum vertically and separating the halves with a spreader—is sometimes recommended, but this is a severe operation and does not seem to have adequate compensating advantages. But whatever method of exposure is employed it will be found that the heart itself is difficult to handle and that the movements prove more embarrassing than would be expected. During systole the walls become stony hard, and the very short diastole gives very little opportunity for palpation. The organ may be pushed to one or other side or may even be partially rotated without interfering with the heart action, but handling about the base or lifting the viscus forwards usually makes the rhythm very irregular and tumultuous or arrests it altogether. Pressure on a spot on the posterior surface of the organ just at the top of the intraventricular septum seems invariably to stop the heart-beat. Lifting the heart forwards in order to expose its posterior surface seems to have the same effect. Allowing the viscus to fall into position and stroking the surface, or applying gentle pressure on the ventricular wall or, if required, more vigorous massage will usually restart the beat. To assist in the process of suturing the viscus a stitch may be placed through the muscle near the apex, where the wall is thickest. If this takes a good hold it will not tear out, and when drawn upon it steadies the heart.

Control of Bleeding.—To control bleeding until sutures can be applied the pressure of the tip of the finger directly on the wound is best. Great care must be taken not to push the finger into the heart cavity. If this method does not suffice a stitch should be rapidly passed into each side of the wound and the ends crossed over without being secured. This will hold the edges together while the final approximating sutures are passed and tied. Furious bleeding—such as might follow accidental tearing of the heart be sutured with 3/0 chromic catgut or fine silk. The stitches should be placed about a quarter of an inch from the margins of the wound and about the same distance apart. They should take a good hold of the cardiac muscle, but should not be so deep as to enter the cavity. It is not necessary to tie them tightly. If bleeding is not arrested one or two superficial sutures may also be used. Oozing should soon cease, but if it does not pressure by the finger for a few moments will probably succeed. A piece of fresh muscle laid over the area will act as a haemostatic patch.

There are many records of successful interventions along these lines, not only with immediate recovery but with complete restoration to health.

On August 6, 1918, René le Fort presented a report before the Academy of Medicine of Paris dealing with a patient on whom he had operated for the removal of a fragment of hand-grenade from the interior of the left ventricle, the patient recovering. At the same meeting le Fort stated that he had removed eleven foreign bodies from the heart in the course of nine operations. In two cases—the one just mentioned and another—the missiles were in the heart cavities. There was only one death in the series.

The Question of Anaesthesia.—In the grievously wounded and severely shocked it may suffice to employ local anaesthesia, and many interventions have been carried out aided by this means alone. The pericardium and the heart itself are said to be insensitive so that it is only a question of infiltration and block anaesthesia for the parietes. But, generally speaking, there is no contra-indication to a general anaesthetic skilfully used. Those who have been brought up in the belief that special anaesthetic apparatus is essential should realize that the many notable operative achievements of the last war were usually conducted under open ether anaesthesia.

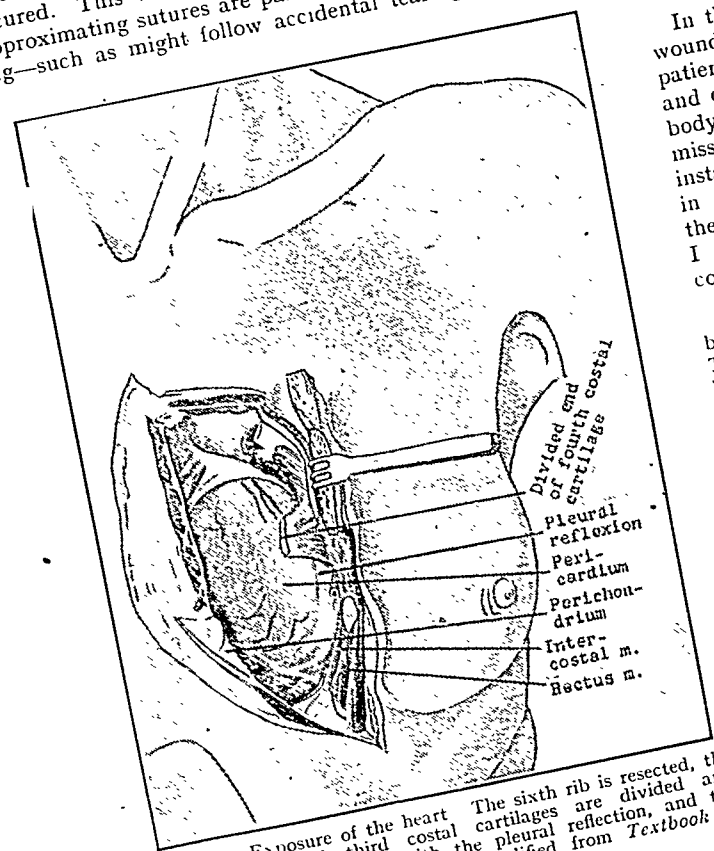


FIG. 3.—Exposure of the heart. The sixth rib is resected, the fifth, fourth, and third costal cartilages are divided and retracted outwards along with the pleural reflection, and the pericardium is fully exposed. (Modified from *Textbook of Operative Surgery*, by Theodore Kocher.)

Missiles Lodged in the Heart

In the group of cases in which there is neither an open wound nor any question of cardiac tamponade the patient will usually make a good immediate recovery, and often without significant symptoms although a foreign body is lodged in the heart. It probably means that the missile has been of low velocity or that it has been, for instance, a spent bullet. There are a good many cases in which such foreign bodies have remained lodged in the heart for some years, apparently without mischief, and I might briefly refer to a case of my own in this connexion.

The patient was an officer, 32 years of age, who was wounded by a machine-gun bullet fired at a range of about 500 yards. There was a snowstorm at the time and the officer had his left hand up to keep the snow from his eyes, and as there was a through-and-through wound just above the elbow it is highly probable that the bullet that lodged in the heart first passed through the arm. In addition it traversed a notebook and a bundle of letters which he was carrying in his tunic pocket. The officer did not appear to have been very severely knocked out after the wound, and when I saw him at the base eighteen days later he was not in any way upset and was rather ashamed that he perforce arrived on a stretcher. The wound of entrance was through the front of the cardiac area and there was no exit. The radiograph showed the bullet in the region of the left ventricle. It was pulsating synchronously with the heart-beat, and in addition there was a whirling movement as if its apex was spinning about in the vortex of the blood stream. After due consideration I made an attempt to remove the bullet, but without success. Now, twenty-four years after the injury, the patient remains perfectly well and is able to live a normal, reasonably active life (*Lancet*, October 19, 1940).

In cases such as the above there is probably little or no haemorrhage from the wound in the heart. The ... may act as a plug as in a case recorded by A. H. ... or the firm contractio... the powerful wall during manipulation—may be controlled by grasping and compressing the base of the heart between the fingers. This is known as the "Sauerbr... ...ip." Wounds should

muscular walls of the ventricles may suffice to stay bleeding. The ultimate fate of these missiles is important as a guide to their management. Though they may remain safely imprisoned in fibrous tissue indefinitely they may be the source of emboli, or may themselves become dislodged and leave the cardiac cavity, forming emboli in the main vessels. Scars associated with such foreign bodies have given way, thus causing the sudden death of the victims. In fact, there appears to be no end to the vagaries of these unwelcome visitors. The immediate symptoms are not always slight, and there may be great cardiac irregularity and irritability and often dyspnœa. As a rule if these symptoms follow directly on the casualty they slowly disappear during a period of months, especially if the environment of the patient is suitable. Much disability may be caused by fear of tragic consequences instilled into the patient's mind or the mere knowledge that the citadel of his well-being is menaced. The fussy attitude of over-zealous relatives and friends, or even the medical attendant, may be detrimental and is to be strongly deprecated. But in some cases, with all the encouragement that hopefulness and the best will in the world can provide, the patient may find that the least exertion brings on cardiac irritability or breathlessness, and for that or other reasons the question of the removal of the foreign body may arise. In these circumstances there is no reason why the possible benefits of surgery need be denied. The matter will have long ceased to be an emergency, and whatever investigations suggest themselves may be carried out at leisure and with proper deliberation. While I would be much opposed to the removal of such a foreign body at all costs, I am strongly in favour of exploration, for the missile may prove to be most fortunately placed for removal and, if not, the wise surgeon can always hold his hand.

Removing the Foreign Body

In the actual intervention the Kocher approach ought to suffice, and especially so if advantage is taken of the additional space which may be secured by removing the costal cartilages right up to the edge of the sternum or even cutting away part of the latter with rongeur forceps. The first problem is to find the foreign body, and that often proves difficult. When the surgeon has finally decided where the cardiac wall is to be incised sutures should be placed on each side of the proposed cut, and he must take care to see that these secure a good hold, as it is by their aid that bleeding will have to be temporarily arrested. The missile must be coaxed out rather than forcibly withdrawn, great care being exercised not to lacerate the heart wall. The defect in the heart must be closed by suture as already described. It is said (Decker) that the mortality from foreign bodies in the heart which are not interfered with is 20%, and that the mortality of surgical intervention is about the same, but it is highly probable that there are some unrecorded operative fatalities which would considerably increase the latter figure.

Foreign Bodies in or about the Pericardium.—These form an interesting group, for the pulsation of the heart is often communicated to them. In some cases they may be associated with sinuses or they may remain safely embedded for years without giving rise to symptoms. Further, they may be the cause of the same sort of disturbances as arise from the presence of foreign bodies in the heart itself. This knowledge justifies exploration in the hope that the missile may be found in a position from which it can be safely and easily removed. In dealing with these foreign bodies it will usually be best to open the pericardium as in the Kocher approach. Even when the foreign body is the cause of a sinus the cardiac movements may be communicated and the discharge lying in the mouth of the sinus may show pulsation. None the less, the proximity to the cardiac region need not deter the surgeon from dealing with such conditions according to established surgical practice.

It has been suggested that missiles in the heart or in the pericardium might be removed under the fluorescent screen, and this method has sometimes been practised by French surgeons. Either through a conveniently placed wound or a small incision suitable forceps are introduced into the pericardium with the idea that the foreign body may be seized and withdrawn under the guidance of the eye. While this method may be feasible with loose bodies or with those only very lightly attached, the consequences might be unfortunate if a missile in the heart wall that was acting as a plug was thus removed. The probabilities of failure would also seem to outweigh heavily the prospects of success. But the method has been successfully employed, and it has this virtue—that, if disaster is not precipitated, the other and more traditional methods can still be employed.

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A RESEARCH CHAIR AT THE R.C.S.

We print below a letter signed by the chairman of the Bernhard Baron Trustees and addressed to the President of the Royal College of Surgeons of England announcing a munificent gift for the prosecuting of research in surgery.

DEAR MR. PRESIDENT,

The Bernhard Baron Trustees wish to express their sincere sympathy with the Council of the Royal College of Surgeons of England on the serious loss sustained by the College owing to enemy action. The damage provides yet another example of the indiscriminate nature of the enemy's attacks on the Capital, for the Royal College is far removed from any military objective. The loss will excite the disgust and sympathy of the whole scientific world.

The Trustees are relieved to learn that some of the irreplaceable specimens, particularly those from the unique Hunterian Collection, had been stored in specially reinforced tunnels, and that many of them have been saved.

The Trustees are also gratified to know that the valuable equipment of the Bernhard Baron Laboratories had already been removed to improvised accommodation in the country, where facilities had been installed so that research work should not be interrupted. They are also pleased to learn that the main buildings of the College, including the Bernhard Baron Laboratories, have not suffered structural damage.

The Trustees appreciate that for some time a large part of the financial resources of the College and of the energies of the Council and Fellows will be engaged in the erection of new buildings and the assembling of a collection of specimens which will re-establish the museum and make it once more the most valuable and complete of its kind in the world.

The enemy may destroy our historic buildings and damage our artistic and scientific treasures, but our spirit will remain undaunted. The scientific work which has formed such a notable part of the activities of the Royal College of Surgeons of England must and will continue. The Trustees realize, however, that one of the essential sinews of your and their endeavour to benefit mankind is the provision of funds for the prosecution of research. They have therefore decided to make a gift of £40,000 for the endowment of a Bernhard Baron Research Professorship at the Royal College of Surgeons, so that, whatever the difficulties with which the Council may be faced in other directions, research will not suffer.

The Trustees feel that in offering this gift to the Headquarters of British Surgery they are making a fundamental contribution to the promotion of the ideals which Bernhard Baron had in mind in his many acts of philanthropy—the improvement of the health and the increase of the happiness of his fellow men.

Yours faithfully,

On behalf of the Trustees,
EDWARD BARON, Chairman.
H. W. DANBURY, Vice-Chairman.

London, N.W.1,
June 12, 1941

BIRTHDAY MEDICAL HONOURS

The names of the following members of the medical profession were included in a Birthday Honours List published in a *Supplement* to the *London Gazette* on June 12.

K.C.M.G.

HENRY HAROLD SCOTT, C.M.G., M.D., F.R.C.P. Director of the Bureau of Hygiene and Tropical Diseases, London.

K.C.I.E.

GORDON GRAY JOLLY, C.I.E., M.B., Ch.B., D.P.H., D.T.M., Lieut.-General, Indian Medical Service. Honorary Physician to the King. Director-General, Indian Medical Service.

Knighthood

ALEXANDER STUART MURRAY MACGREGOR, O.B.E., M.D., LL.D., D.P.H. Medical Officer of Health, Glasgow.

PHILIP HENRY MANSON-BAHR, C.M.G., D.S.O., M.D., F.R.C.P. For services to tropical medicine and as Consulting Physician to the Colonial Office.

JOHN SEBASTIAN BACH STOPFORD, M.B.E., M.D., F.R.S. Professor of Experimental Neurology and Vice-Chancellor, University of Manchester.

C.M.G.

JOHN FEARBY CAMPBELL HASLAM, M.C., M.D., F.R.C.P., D.P.H. Colonial Medical Service. Director of Medical Services, Northern Rhodesia.

FRANK SANDLAND HONE, M.B., B.S. For public services in the State of South Australia.

JAMES BALFOUR KIRK, M.B., Ch.B., D.P.H. Colonial Medical Service. Director, Medical and Health Department, Mauritius.

C.I.E.

CODANDA MADIAH GANAPATHY, M.C., M.B., Ch.B. Lieut.-Colonel, Indian Medical Service. Director of Public Health, Madras.

MARK ALLEYNE NICHOLSON, M.B., B.S., D.P.H. Lieut.-Colonel, Indian Medical Service. Chief Medical Officer in Central India and Residency Surgeon, Indore.

CAMERON MACDONALD NICOL, M.D., D.P.H. Lieut.-Colonel, Indian Medical Service. Lately Director of Public Health, Punjab.

HUGH STOTT, O.B.E., M.D., F.R.C.P., D.P.H. Major-General, Indian Medical Service. Honorary Surgeon to the King. Surgeon-General with the Government of Madras and lately Inspector-General of Civil Hospitals, Bihar.

GEORGE VERGHESE, M.D., D.P.H., D.T.M.&H. Lieut.-Colonel, Indian Medical Service. Director of Health and Inspector-General of Prisons, Orissa.

C.B.E. (Civil Division)

ALBERT VICTOR BERNARD, O.B.E., M.D., D.P.H. Chief Government Medical Officer, Malta.

JAMES ALISON GLOVER, O.B.E., M.D., F.R.C.P. Lately Senior Medical Officer, Board of Education.

LIM HAN HOE, M.B., Ch.B. For public services in the Straits Settlements.

JOHN CRAWFORD KNOX, M.B., Ch.B., D.P.H. Honorary Consultant Adviser to the Secretary of State for Scotland in connexion with the Emergency Hospitals Organization.

ARTHUR MASSEY, M.D., D.P.H. Medical Officer of Health for Coventry.

HARRIS MUNDEN MOSDELL, M.D. Secretary for Public Health and Welfare, Newfoundland.

ALBERT WILLIAM SHUGG, M.B., B.S. For professional and philanthropic services in the State of Tasmania.

O.B.E. (Civil Division)

PAUL BOFFA, M.D. District Commissioner, Malta.

Mrs. ETHEL CASSIE, M.D., D.P.H. Senior Assistant Medical Officer of Health for Maternity and Child Welfare, Birmingham.

THOMAS HERBERT DAVEY, M.D. Professor of Tropical Diseases of Africa, School of Tropical Medicine, University of Liverpool. Director of the Sir Alfred Lewis Jones Research Laboratory, Sierra Leone.

ANDREW LESLIE DYKES, M.D. Hospital Officer, Southern Region, Emergency Medical Service.

IAN FRASER, M.D., M.Ch., F.R.C.S. Major, R.A.M.C. Commissioner, St. John Ambulance Brigade, Northern Ireland District.

JOSEPH MARTIN REEVES HENNESSY, L.R.C.P.&S., D.T.M.&H. Lieut.-Colonel, Indian Medical Service. Civil Surgeon, Jubbulpore, Central Provinces and Berar.

HARRY BROWN HETHERINGTON, M.D. Colonial Medical Service. Senior Medical Officer, British Solomon Islands Protectorate.

NARIMAN MUNCHERSHAW HODIVALA, M.B., B.S., D.P.H. Medical Officer of Health, Aden.

THOMAS RITCHIE RODGER, M.D., Ch.B., F.R.C.S.Ed., J.P. Chairman of the Hull and District Juvenile Advisory Committee.

JOHN ALEXANDER SCOTT, M.D., D.P.H. Medical Officer of Health for the Metropolitan Borough of Fulham. For services to Civil Defence.

FREDERICK AUGUSTUS BERRILL SHEPPARD, M.B., B.S., F.R.C.S.Ed. Major, Indian Medical Service. District Medical Officer, Madura, Madras.

HUBERT CECIL MAURICE WILLIAMS, M.R.C.S., L.R.C.P., D.P.H. Medical Officer of Health for Southampton. For services to Civil Defence.

M.B.E. (Civil Division)

EUSTACE HENRY TAYLOR CUMMINGS, M.D., D.P.H. Medical Officer, Sierra Leone.

PAUL THANGASAMI JESU DOSS, M.B., Ch.B., D.T.M.&H., D.P.H. Medical Officer of Health, Secunderabad Cantonment, Hyderabad, Deccan.

Miss ELIZABETH ISABEL HAMILTON-BROWNE, M.B., Ch.M., D.T.M. Women's Medical Service. Lady Assistant to the Inspector-General of Civil Hospitals, Punjab.

BULCHAND SHIVDASANI PARSRAM, M.B., B.S. Medical Officer, R.B. Udhavdas Tarachand Hospital, Shikarpur, Sind.

GEORGE HAROLD TAM THOMAS, M.D. Chinese Medical Officer, Hong Kong.

Kaisar-i-Hind Gold Medal

Mrs. LYDIA TORRANCE ALLEN, M.D., F.R.C.O.G. Superintendent, Lady Dufferin Hospital, Calcutta, Bengal.

British Empire Medal (Civil Division)

TUTU TEKANENE. Native Medical Practitioner (First-class), Gilbert and Ellice Islands Colony.

Among the other Birthday Honours are three which should be mentioned in this column: Viscount Nuffield, a great benefactor of medicine and an Honorary Member of the British Medical Association, is created G.B.E. for public services; Sir John Maude, Secretary of the Ministry of Health, is advanced to K.C.B.; and Alderman Walter Deacon, President of the Pharmaceutical Society of Great Britain, receives the C.B.E.

FACULTY OF RADIOLOGISTS

Presidential Address

The annual meeting of the Faculty of Radiologists was held at 32, Welbeck Street, London, on May 23. The programme opened with the business meeting, at the conclusion of which the president, Dr. S. COCHRANE SHANKS, said that the past year had, regrettably, been one of few activities for the Faculty as a whole. It had been possible to hold only one scientific meeting, but that was a very successful one, considering the times. The adaptability of man was a remarkable phenomenon, and while a year ago the invasion of the Low Countries was enough to cause the cancellation of the scientific part of the annual meeting, this year, in spite of the ordeal of fire and destruction through which the nation was passing, the Faculty was holding scientific meetings and, he prophesied, successful ones. He was glad of this response to the present situation. The late Wilfred Trotter, in that finest of his philosophical writings, *The Herd Instinct in Peace and War*, contrasted the German or "wolfpack" response to this instinct, powerful in attack but weak in disaster, with the socialized response in which adversity engendered a slowly mounting moral determination which was finally overwhelming in its power. This augmentation of the national energy in the face of danger accounted for the change in attitude. It was also the justification for another activity in which he was taking part as the Faculty's delegate—the Planning Commission of the B.M.A. Much criticism had been levelled at this body, but surely, if any planning was to be done, now was the time, when the tide flowed strong, rather than during the ebb of emotions when the war was ended. For then, unless a plan had been completed in major outline, nothing at all would be done. The first duty of the committees which had recently been appointed by the Commission would be to find out the facts. This inquiry would apply to diagnostic and therapeutic radiology as to the other branches of medicine, and at this stage he would need the help of his colleagues. He proposed before long to circulate a questionary among the members of the Faculty, and would ask them to give, under seal of anonymity, such facts about their work in hospital and in private as they felt disposed to divulge; also to give him their views on what alterations and improvements were called for in the radiological services of their district. Later on he hoped that the Commission would set up a radiological subcommittee, with a majority of radiologists co-opted, to design the x-ray services of the country, both diagnostic and therapeutic.

He now had a very pleasant duty to perform—to welcome and formally to admit two distinguished colleagues as Honorary Fellows of the Faculty, Lord Horder and Professor Cohen. Lord Horder needed no introduction from him. Indeed, in the attempt to prepare a eulogy of him he at once suffered from an *embarras de richesse*. But it was particularly as a friend of radiology that he was welcomed and they



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were glad to honour him with the Fellowship. Again it was chiefly as a friend of radiology that they welcomed their second Honorary Fellow, Prof. Henry Cohen of the chair of medicine in the University of Liverpool.

Discussions

The Radiodiagnostic Section, with the vice-president, Dr. E. Rohan Williams, in the chair, then held a discussion on "Gastritis and Duodenitis" in which Dr. F. R Bernridge (Cambridge), Dr. James Dow (St. George's), and Dr. G R Mather Cordiner (St. George's) took part. This was followed by a short paper on "The Association of Short Oesophagus and Peptic Ulcer" by Dr. A. S. Johnstone (Leeds).

In the afternoon the Radiotherapy Section, with Mr. G F. Stebbing in the chair owing to the indisposition of the vice-president, Dr. W M. Levitt, discussed "The Value, Technique, and Limitations of Biopsy." The chief speakers were Dr. R. W. Scarff (Middlesex), Mr Lionel E C. Norbury (St. Mark's), Dr. F. Ellis (Sheffield), Dr F Gordon Spear (Cambridge), Mr. T. A. Green (St. Thomas's), and Dr J R Nuttall (Manchester).

Correspondence

The Darning of Hernias

SIR,—At the present time it is important for reasons of national service that hernias should be dealt with by the simplest, quickest, and most secure method. It is a subject of satisfaction to me, therefore, that the "darn and stay-lace" method which I described in 1918 (*Practitioner*, 1918, **2**, 100, 406), and have used ever since with good results, has received recent endorsement from surgeons of large experience, particularly Souttar, Ogilvie, and Maingot. So far back as 1922 Souttar (*British Medical Journal*, 1922, **2**, 1024) wrote: "The method of darning hernias was, I believe suggested by Sampson Handley in 1918, and I can only attribute the limited use which has been made of it to the absence of a suitable suture material. . . . I have now used mercurialized silk for several years and in no case have I seen any signs of irritation, nor has it ever been necessary to remove the silk." "The advantages of the method are its extreme facility, the avoidance of extensive dissection and of traction with a resulting absence of shock, its applicability to every conceivable form of hernia, and the security of the result."

I must differ from my friend Mr. Souttar on two minor points. The success of the method is not dependent on the use of mercurialized floss silk, excellent though this material may be. I have generally used Japanese silk or linen thread, kept in 1 in 1,000 flavine spirit, boiled before use, and immersed during the operation in watery flavine 1 in 1,000. The impregnation of the suture material with a non-irritant antiseptic is a common-sense precaution which should not be omitted.

There appear to be two reasons why my operation has not been generally adopted. For many years the erroneous impression has prevailed that catgut is a safer suture material than silk. This impression dates from a period when gross infractions of aseptic technique were common, and is now out of date, provided that the silk or linen thread used is the thinnest which will do the work, and that it is impregnated with an antiseptic harmless to the tissues. The groundless fear of unabsorbable sutures is the first reason why the operation has not been widely used. The second is that in 1924 Gallie and le Mesurier introduced the use of fascial strips taken from the patient as sutures to close the inguinal canal. The method is undoubtedly efficient, though complicated and relatively clumsy. As Ogilvie says: "Fascial suture always adds an operation on the leg to one on the hernia," and troubles may arise from the unnecessary thigh wound. The ingenuity of the Gallie operation has caught the fancy of surgeons, and it has been widely adopted. I doubt, however, whether any surgeon who tries my plan, or one of its modifications, will ever return to the Gallie method.

As I have published nothing on the subject since 1918, I may be allowed very briefly to describe the operation as applied to an ordinary indirect inguinal hernia, and to stress the principles upon which it is based.

(1) The external oblique is incised from the external ring to the internal ring. An identification forceps is applied to each cut edge. The sac is then completely removed and the cord retracted upwards.

(2) The posterior wall of the inguinal canal is thus exposed, bounded above by the outer edge of the conjoined tendon and below by the upturned lower margin of Poupart's ligament. A single long thread of medium thickness, taking up the edges of these structures alternately, is used to construct the "stay-lace" which fills the gap between them with an intercrossing network of threads. Starting below, the stitch ascends the canal in about three insertions of the needle, then descends to its starting-point, where a careful knot is tied. The ascending threads cross the descending ones as nearly as possible at right-angles The stitch must not be tense and must not displace the conjoined tendon. To tie the knot securely without unduly tightening the stay-lace is easy if the assistant grips the threads near the knot with two pairs of smooth forceps

(3) The cord is replaced, the external oblique sutured with three or four interrupted stitches, and the external ring suitably reduced in size.

(4) The external oblique is swept clean by gauze dissection and is darned over the whole extent of the canal by a long thread passing in and out of it and alternately upwards and downwards, but always in the direction of its intercolumnar fibres. The darn provides a new and strong set of intercolumnar fibres for the stretched and thin external oblique. The ends of the darn are cut rather long and tucked away under the skin

The operation is based upon the following considerations:

(1) A silk or linen thread, if aseptic, becomes encysted in a layer of new fibrous tissue which is adherent both to the thread and to its surroundings.

(2) It, however, the thread is under permanent tension it will cut through its attachments to the tissues by a process of pressure atrophy. Hence the stay-lace must be normally slack, though it will become tense during straining efforts.

(3) Both the anterior and the posterior walls of the stretched inguinal canal require strengthening, the former by the darning of the external oblique (a step which Maingot appears to omit), the latter by the stay-lace which fills up the gap below the conjoined tendon.

(4) Normal anatomical structures should not be displaced or put under any abnormal tension. The frequency of recurrence after the Bassini operation is due to the dragging down of the edge of the conjoined tendon to Poupart's ligament. Either the tendon splits and allows a direct hernia to emerge or the stitches may cut through their holds.

Mr. Rodney Maingot's suggestion (May 24, p. 777) that the femoral canal should always be closed by an extension of the stay-lace seems to be an excellent one, and he has shown how the method may be adapted to the treatment of direct hernia. I venture to hope that many other surgeons will try the method.—I am, etc.,

W. SAMPSON HANDLEY.

London, W 1, June 16.

Da Costa's Syndrome

SIR,—You have printed in the *Journal* of May 24 and 31 and June 7 long and interesting articles on Da Costa's syndrome. Dr. Paul Wood is led to the conclusion that this condition is due to central stimulation, and that the stimuli are emotional in nature. The prominence which you have given to these lectures suggests that a very considerable number of cases occur, both in the Army and among civilians, and require appropriate treatment. Clearly such treatment must be directed to the emotional life of the patient; in other words, he requires psychotherapy. If you refer to the summary and conclusions in Dr. Wood's paper of June 7 (p. 845) you will find the following: "Treatment in the Army is shackled by inability to remove the distressing environmental factors which have caused or have aggravated the breakdown; by the difficulty in establishing intimate contact with a patient who did not choose his medical confidant; by the duty of having to serve the State first, the patient second." This could be the text of a long and interesting sermon which I wish Dr. Wood had time to give us.

What therefore happens to these patients? Earlier in the paper he says: "We should endeavour to make the most of material which is not suited to warfare; a man working is an asset; a man broken is a liability." Not long ago we were told in a broadcast that the morale of the nation was so high that the Ministry of Health had closed as unnecessary an

E.M.S. hospital equipped for the treatment of psychoneurosis. This conflict of testimony as to the existence of these cases suggests that, as in the last war, once more, under pressure of hostilities, the State is confusing mental illness with moral turpitude, and we should do well to heed Dr. Wood's advice not to "let our own emotions govern our treatment of these men."

A few years ago an analysis was published of cases of panel patients sent to a referee. This analysis revealed a very high percentage of psychoneuroses masquerading under such titles as anaemia. Possibly some of these sick folk have been benefited by the new valuations afforded by war conditions. A short-sighted view may applaud this, but a longer vision sees the national neurosis of Germany cured by obedience to the machine of war. Dr. Wood emphasizes the importance for success in these cases of the rapport between patient and doctor, and sounds a warning note which should be pressed on the notice of those who are hurrying forward the establishment of a State Medical Service. Will there not be a danger of serving the State first and the patient second? Those of us who are engaged in the work of psychotherapy know that these sufferers can often be restored to social usefulness among their fellows and in the process become less prejudiced and more responsible members of the community.

It is, of course, very difficult for the official machine to test the value of psychotherapy. It can be satisfied that an appendix has, in fact, been removed; but it cannot know what urge in the patient has been satisfied in this way, nor foresee that ere long the patient will resort to the psychotherapist because the operation did not cure him.—I am, etc.,

London, W.1, June 8. GRACE NICOLLE.

SIR,—I should like to congratulate Dr. Paul Wood upon the articles on Da Costa's syndrome published in your issues of May 24 and 31 and June 7. His critical and scientific approach to the subject reaches a standard too rarely seen in work of this nature.

In your leading article (June 7, p. 858) you refer to the title "angina innocens" as being unfortunate in reference to those cases with inframammary pain. I still feel, for the rather small group of patients with (1) really severe pain which (2) radiates down the left arm, and who (3) have other cardiac symptoms, that some distinctive label is necessary which will enable a physician to recognize them and to realize that they are not suffering from angina pectoris—another vague and misleading label.

Labels are made for convenience and should be both brief and free from inaccuracy. The type of pain labelled by me "angina innocens" is a type which exists and for which a distinctive title is needed. Perhaps the writer of your leading article can supply a better one. Failure to recognize this clinical group leads to years of unnecessary apprehension and misdirected treatment of these patients, who in reality are suffering from an innocent condition which often mimics closely anginal pain of an organic type. Unless they are adequately labelled, mistakes in diagnosis will result from their non-recognition.—I am, etc.,

London, W.1, June 9. GEOFFREY BOURNE.

Blast Injury to Lung

SIR,—I was glad to read that the point of my letter of April 26 has been taken by Dr. Osborn (June 7), and that he now endorses the view (emphasized not only in that letter but earlier on[1]) that the term "blast injury" to the lungs should be restricted to those cases in which it can be established that lesions could have been caused by the impact of the blast wave on the body. If in the future he has to differentiate such lesions, he might find it useful to acquaint himself in advance with some fundamental facts relating to blast and explosions, and by so doing discover meaning in what he now finds fantastic and nonsensical. In making a differential diagnosis between blast and some other traumatic agent the greater difficulty is not the recognition of haemorrhagic lesions in the lungs, but determining whether the subject under consideration was in fact exposed to a blast pressure sufficiently high to cause those lesions.—I am, etc.,

Oxford, June 9. S. ZUCKERMAN.

*** This correspondence is now closed.—ED., *B.M.J.*

[1] *Proc. roy. Soc. Med.*, 1941, 34, 141.

Chronic Sick and Healthy Workers in Bombed Towns

SIR,—The trenchant, moving, and practical plea of Sir Frederick Menzies (June 7, p. 868) for the chronic sick to be removed from public health and assistance institutions, as well as from voluntary hospitals and homes for incurables, to places of comparative safety and comfort outside our large towns, deserves to be insisted upon firmly and *collectively* by the medical profession unless we as doctors repudiate our primary functions of the care and preservation of life and health of the community and the prevention of disease. Do we?

Sir F. Menzies's urgent plea applies equally and more so and for the same reasons to the demand made by British architects, surveyors, doctors, and others qualified technically who advise with scientific and practical authority the provision of communal sanitary shelters affording the fullest possible protection against direct hits from bombs of heavy calibre. If, as is openly said, this war is to be determined eventually by the attempted decimation from the air of British and German civilians, what a ghastly responsibility our Government and the Ministries concerned assume in adhering blindly to their (official) air-raid shelter policy of attempting to "bolster up" the morale of our brave working-class population (on whom the fate and destiny of this country fundamentally depend) by the provision of inadequate and flimsy shelters and "strutted" basements on a haphazard, unscientific, and nationally unorganized "plan." Do not these criticisms also apply to a great extent to the Government policy and plan of evacuation? I cannot believe that the Prime Minister, who approves a "spiritual front," values money more than British lives. Are our Intelligence Departments cognizant of what is being done in Germany (and Austria) to protect civilians against the coming British blitz, and is Hitler likely to spare money to win the war?—I am, etc.,

F. G. BUSHNELL, M.D.,
Woking, June 9. Major R.A.M.C., T.F. (ret.).

SIR,—Sir Frederick Menzies's trenchant letter in your issue of June 7 (p. 868) prompts me to put forward a suggestion. All over the country are established auxiliary convalescent hospitals, equipped and staffed by the British Red Cross Society, under Government auspices and paid for indirectly by Government funds. Country houses of varying types and suitability in localities accessible and inaccessible have been converted to take from forty beds upwards. These are intended for convalescent soldiers, and I will hazard a guess that they are being used at not more than 15% capacity. They are not really suited for convalescent soldiers; although they are well equipped (too well in many cases) and pleasantly situated they lack supervision and discipline. It is impossible to supply from the Army suitable N.C.O.s to carry out necessary disciplinary control and organize physical training and employment, so necessary for convalescent soldiers. These men must be got fit before return to their units, or they have to be hardened up again before they are able to continue strenuous military training or duties. The return of *soft* men to units is a source of irritation and delay in training to C.O.s and company officers.

These auxiliary convalescent hospitals would be ideal for the accommodation of the type of patient to which Sir Frederick refers, and I think that if pressure were brought to bear in the right quarters these institutions could serve a useful purpose to full capacity.—I am, etc.,

June 12. "X."

Vitamin C in the Winter of Wartime

SIR,—I preface these remarks by saying that in my opinion vitamin C is the most necessary of all the vitamins, and that so long as there is an adequate supply of it adults can keep in good health with practically none or very little of the others. I base this opinion on my personal experience, having lived for the best part of seven years in the 'eighties on the Board of Trade dietary for merchant seamen in sailing ships, and later having the medical care of a large mental hospital, where the patients were prone to have ideas about their food and especially green vegetables.

The people who framed the Board of Trade scale some eighty or more years back knew nothing about vitamins as such, yet they devised a diet which kept sailors of those days in a

persistent state of hunger but in good health and able to do the most laborious work under very harassing conditions and at the same time to cost the shipowner the minimum and not encroach on his profits. As an example of efficiency with economy it was a masterpiece.

Except perhaps for some vitamin B, in split yellow peas so hard that I have seen cooks put bits of yellow soap in the soup to soften them, and in biscuits so hard baked that they had to be broken with an iron belaying-pin, I cannot think of any other vitamins in the solid part of the diet. The usual sources of vitamins—milk, eggs, butter, fruit green vegetables, etc.—went with the wind as soon as you dropped the pilot; they just did not exist. Our sea passages were from three to four and a half months, and I never saw anyone ill with scurvy, neither did I ever meet anyone who had. In fact I never saw anyone laid up with any illness; it was no use being ill because there was no doctor and the only medicines were Epsom salts and sulphur dealt out by the steward. The secret of the good health was 1 oz. of lime-juice daily, which had to be taken according to the Act, and anyone who did not like his lime-juice and got sick was "logged" and had his pay stopped.

In my mental hospital experience I found that a good deal of winter ill-health, anaemia, asthenia, oedema of the feet etc.—"scorbutoid" conditions—could be improved by adding vitamin C in the form of pickled red cabbage with some of the meals. The dietary, of course, included boiled cabbage but a considerable part of this, as in any community, I venture to say, goes into the pig-tub, but not so pickled cabbage. Red cabbage pickled has all the attributes necessary for keeping vitamin C intact; it is raw as it is preserved in vinegar, it is acid, and in addition it is appetizing and cheap. If anyone thinks that there is more vitamin in green cabbage then there is no reason why it should not be pickled in the same way.

On reading the report on "Vegetables as Food" (*Journal*, April 26, p. 688) I was surprised and concerned at the enormous tonnage of vegetables produced, with consequent great acreage, labour, cartage, cooking, etc., required for so little real food value, and I cannot help wondering whether it would not be more profitable to rear sheep and grow sheep fodder; this country, like New Zealand, is good for sheep.

I suggest that people who want to have a supply of vitamin C in a palatable form should store pickled cabbage for use in the six to seven months of winter, when green vegetables are scarce and citrus fruits a luxury.—I am, etc.,

H. M. BERNCASTLE

Croydon, June 7.

Sarcoidosis

SIR,—I was glad to see in your issue of May 31 (p. 833) the comments of Major Hugh Garland upon my recent paper on sarcoidosis (April 12, p. 552). In the case quoted there was no evidence of previous local eye trouble such as irido-cyclitis, and several other observers were agreed as to the presence of Adie's syndrome. I was satisfied that the visual field defect was of central origin, and was naturally very interested to hear of the Swedish case where uveo-parotitis was "complicated by a gross cerebral and possibly spinal disorder." My main object in publishing this case was not, however, to claim any constant relationship between sarcoidosis and Adie's syndrome, but rather to illustrate certain speculations as to the nature and stages of infective processes in general. It must readily be admitted that the syndrome of Adie may be the result of more than one special pathological process alone.—I am, etc.,

G. ERIC LEWIS.

Hull, June 3.

Acute Dilatation of the Stomach

SIR,—In their very interesting paper (May 17, p. 751) Mr Maurice Lee and Dr. Edgar Somerville report a case of acute dilatation of the stomach following an operation of partial gastrectomy and discuss the current views of this condition. They could not find an identical case in the literature, but I think the frequently observed symptom of the so-called acute dilatation following operations on the gall-bladder is quite analogous in view of the exciting factors. According to current theories the gastric paresis or paralysis results from impulses through interference with the motor and secretory innervation of the stomach, its mechanism being considered a nervous reflex of the sympathetic-parasympathetic system. Similar troubles, indeed, in a milder and incomplete form, are well known in the symptomatology of the duodenal (juxtapylorie) ulcer, described by Soupault with the name "syndrome pylorique" or, as I have called it, "duodenal symptom complex." The associated obstruction of the duodenum by the root of the mesentery—first described by Rokitansky (1861)—causes, as I think, identical retrograde reactions on gastric motility and secretion.

To the case described by Lee and Somerville I can add an analogous observation which I have published (*Arch. Verdauungskrankh.*, 1928, 43, 410). It refers to a chronic intermittent dilatation of the stomach combined with an intestinal occlusion and complicated by arrosion of an old duodenal ulcer, which caused a fatal bleeding of the gastro-duodenal artery. It is of spontaneous origin, like the majority of the cases belonging to this category which I have studied for years; many of them appeared in the course of wasting diseases. My first researches were made in patients with advanced tuberculosis of the lungs, and this patient also was affected with a chronic bilateral pulmonary tuberculosis. Chronic phthisis with concomitant affection of the bronchial glands plays, too, an important part in a distinct group of peptic ulcers. I have found that the mediastinal portion of the vagus nerve, adherent to and compressed by these glandular callosities, becomes inflamed, and I described (1916) distinct neuritis and post-neuritic atrophy of the fascicles and the medullary sheath of the vagus (see the illustrations in my book *Functional Diseases of the Intestines*, Oxford University Press, 1939 p. 41, ff.).

Knowing this association I could diagnose the condition in the mentioned case during life as a gastroplegia and dilatation of the stomach and a paralytic intestinal occlusion, probably connected with a lesion of the vagus nerve, which has been completely confirmed by the post-mortem. For particulars I must refer to the quoted papers and my report to the second Congrès International de Gastro-entérologie, Paris, 1937. But I lay, too, stress upon the fact that the whole condition is neurogenic, a consequence of a kind of paralysis caused in a blocking of the gastro-intestinal regulation. Gastric dilatation in the forefront of clinical symptoms and the constriction of the duodenum are co-ordinated affections, both provoked by the paralytic intestinal occlusion which starts with the slipping down of the convolutions of the small intestine into the true pelvis. The raising of the pelvic region (Trendelenburg) first recommended by Schnitzler is a very effective part of the treatment, but it must be completed by other means.—I am etc.,

GUSTAV SINGER, M.D.,
Emeritus Professor, Vienna University.

Sanderstead, May 26.

Ether Convulsions

SIR,—I had the fortune to see a number of striking cases of this condition a good many years ago, when I was working for a few months in an area where heated ether was the routine anaesthetic. In all the years that have since passed I have seen but one case, in which the circumstances were so unusual that I must mention them in some detail. The patient, a woman approaching 70, was under light anaesthesia with gas and oxygen combined with local (novocain). No ether at all had been used intentionally, though it is probable that a small amount of ether was lying in the rather complicated apparatus which was used. Despite these unusual circumstances, I had no difficulty in recognizing the nature of the case, which was unmistakable.

It is to this unmistakable character of the convulsions, as I have seen them, that I am now writing to draw attention. I think I have read most of the annotations on the subject, and I do not think I have seen described what I would regard as the really typical feature. It is that the convulsion is essentially expiratory. A prolonged and violent clonic convulsion is intermittently and momentarily interrupted by a short inspiratory gasp, during which the convulsion ceases. From the cases I have seen I should regard this as completely typical, but I am sure it has not been generally described. Unless they conform to this type, convulsions under anaesthesia should not be spoken of as "ether convulsions."

The other and more generally recognized characteristics of prolonged deep anaesthesia and hyperpyrexia were also manifest in the cases I saw. One fatal case reached a temperature of 110° F. I cannot, however, subscribe to the

emphatic statement made in Mr. Dickson Wright's letter in your issue of August 31, 1940 (p. 299), in which he says that the cause must be sought not in the anaesthetic but in the "feverish, atropinized, mackintosh-covered patient." One cannot but be influenced by one's own experience, and in my own case there can be no argument about the direction in which that points. It points to the conclusion that heated ether is the responsible agent. I am not prepared to maintain that this is the whole of the matter, but I am convinced that it is the heart of the matter.—I am, etc.,

Liverpool, June 9. CHARLES WELLS.

Carriers of Tuberculosis

SIR,—The object of Dr. James Maxwell's paper (May 3, p 665), to stimulate the search for the human sources of tuberculosis infection and to emphasize that there are a number of people who cough up tubercle bacilli without any adequate stethoscopic and radiographic findings, deserves full consent. But the conception of "tuberculosis carriers" must be firmly contradicted. It implies the acceptance that the tubercle bacillus may play the part of a saprophytic parasite in the human organism, and this hypothesis, far from having the shadow of a proof, appears to be most dangerous. Rarely saprophytic acid-fast bacilli have happened to be found in bronchiectatic sputum and in the discharge of lung abscesses, but they could not be acknowledged as tubercle bacilli when they were cultured. We are bound up with the principle that the presence of genuine tubercle bacilli in the sputum means a destructive tuberculous process, even a minute one, in the lung tissue, in the mucous membrane of the bronchial tract, or in a lymph nodule. If thorough and repeated examinations fail to reveal the spreading focus it is owing to our diagnostic inefficiency and to the benign and sluggish features of the tuberculous lesions. Patients like those reported by Dr. Maxwell (Cases 2, 3, 4) are not to be considered as T.B. carriers whose positive expectoration causes only a *social* interest; they themselves are in danger, though perhaps they will escape the danger for many years or for good; they are ill and should be subject to never-ceasing attempts to discover the obscure sources of their infectivity. Positive sputum is, according to our recognition, the sure sign of active tuberculosis, although the concerned lesion may be hidden, stationary, "arrested"—that is, at present confined and not prone to advance, but the threat of advance is existing. The term "activity" ought to be used for the definite prospect, not for a momentary stage, and activity requires continuous observation. There is no way of "sterilizing the respiratory tract" but the attempt to cure the tuberculous lesion.

As it is proved by extensive investigation that the infectibility of a tuberculous patient depends on the quantity of the ejected bacilli—that is, on the amount of cough and sputum—the public danger arising from cases which occasionally bring up a small number of bacilli is much less than that from cases simulating a chronic "catarrh." The outstanding task of prevention is therefore to teach doctors, nurses, and laymen that every protracted or relapsing bronchitis and tracheitis requires radiographic and sputum supervision, and that the occurrence of general good health, including normal temperature, undiminished body weight, and even perfect sportive fitness, does not rule out at all the presence of active tuberculosis.—I am, etc.,

High Carley Sanatorium, near Ulverston, June 3. E. FRAENKEL, M.D.

Control of Tuberculosis

SIR,—Dr. G. E. Johnston's contribution on the control of tuberculosis (June 7, p. 868) must have aroused wide attention. He has put forward a number of interesting suggestions which can undoubtedly form the basis of discussion on this all-important question. Certain fundamental principles, however, must first of all be accepted.

The whole problem of the control of tuberculosis is in essence a *social and national question* conditioned largely by overcrowding, malnutrition, and bad housing, and the solution must have a national and not a local form. Thus any scheme which is to be embarked upon must, for its success, be assured Governmental financial support and in addition national planning.

Dr. Johnston's suggestion that the country be divided into regions is certainly the logical approach. Such a regional scheme would no doubt have as its basis the size and density of the local population and not be dependent on any of the existing artificial county boundaries. Each region would have its quota of sanatorium beds and in addition a "settlement scheme on Papworth principles."

The medical control of the suggested scheme could be conducted by a joint medical tuberculosis committee presided over by the chief regional tuberculosis officer, with its membership drawn from the local tuberculosis officers and medical superintendents of both the sanatoria and the associated "settlement." It is just such a committee which could allocate the available beds to: (*a*) cases which could reasonably be expected to respond to some form of collapse therapy; or (*b*) patients who would profit by a brief period of sanatorium regime for its purely educational value in the conduct of their future private lives. Furthermore, this joint medical tuberculosis committee would have the unique opportunity of collating the statistical data of all mass surveys and medical and surgical investigations conducted throughout the region. It is more than probable that, in pursuing such a course, the quality of the work of the more backward and unprogressive institutions would be raised to a higher level. Finally, such a regional medical committee could very satisfactorily combine with the general practitioners of the area in the domiciliary treatment of the chronic and incurable cases for whom sanatorium therapy is redundant.—I am, etc.,

Middleton Sanatorium, Yorks, June 7. BERTRAM MANN.

Injury and Internal Disease

SIR,—The clearly written paper by Dr. G. F. Walker (May 3, p 659), with its painstakingly collected case records, deserves—and I trust it will—to go down in the medical literature as a standard work of reference for students of this special question. It is therefore essential that it should be as complete as possible.

May I add one very important item which unfortunately has been entirely overlooked: rheumatism. There is practically no other internal disease which would in the everyday life so frequently and so clearly show the intimate relationship with injury like the varied forms of rheumatism do. Fascinated by the striking evidence given by so many of my own cases already many years ago I felt induced to try and give a possible explanation of this, beyond any doubt, observed fact. Some new—in those days anyhow—findings of blood serology and immunity (*Immunitätslehre*) have supplied a useful basis. In an elaborate paper on "Trauma and Rheumatismus" (in the early 'twenties in the *Wien. klin. Wschr.*) I have laid down some principles which proved to be a very useful working hypothesis ever since. A short reference may be found in another paper of mine on "The Balneological Treatment of Post-traumatic Rheumatic Exudates" (*Arch. med. Hydrol.*, Aug., 1925).

By now injury is generally considered as a causative factor *par excellence* of rheumatism, corresponding one way or the other with the triple classical criterion (*a*, *b*, *c*) of Dr. Walker's paper.—I am, etc.,

L. SCHMIDT, M.D. (Prague).

Buckminster Hall, Grantham, May 24.

Physical Medicine and Orthopaedics

SIR,—Your annotation on physical medicine and orthopaedics (April 26, p. 633) appears to have upset certain orthopaedic surgeons, and a reply is called for to the letter of Prof. Harry Platt and of the president and secretary of the B.O.A. and the chairman and members of the Standing Committee on Fractures (May 24, p. 791). As a mere physiotherapist it is with considerable temerity that I venture to cross swords with this distinguished group of orthopaedic professors and surgeons.

First let me say that I entirely agree with them that the title of "orthopaedic physician" would be a misnomer, for the very good reason that the physiotherapist is called upon to treat every type of case both surgical and medical. At some stage or other practically every type of hospital case needs and benefits by physiotherapy, and though we treat large numbers of orthopaedic patients, we treat still larger numbers of general surgical and medical cases. In my opinion a mistake has been made in so closely identifying orthopaedic surgery and physiotherapy. Having agreed thus far with the orthopaedic surgeons I must now take up arms in defence of the physiotherapist.

Prof. Platt states that "the orthopaedic surgeon prescribes [physical treatment] in detail . . . and controls such treatment throughout. The writer of your annotation must realize that there will be no withdrawal from "the position." I am afraid that Prof Platt must regard the physiotherapist as an unnecessary form of human life. Now it is the duty of the physiotherapist to see that the instructions of the surgeon or physician are faithfully carried out. Unfortunately many medical men have the misfortune not to possess Prof. Platt's knowledge of physical medicine and numbers of patients are still referred to our departments with no further instructions than the two words "Please treat." Many eminent surgeons still fall into the error of asking for a "muscle test" to be done within twenty-four hours of a suspected nerve injury, while others through lack of knowledge prescribe various forms of electrotherapy, which, if carried out, would be definitely harmful to the patient. It is, therefore, most necessary to have a physiotherapist in charge, who can suggest more suitable forms of treatment to the physician or surgeon. The two letters already referred to almost suggest a definite hostility on the part of the orthopaedic surgeons concerned towards physiotherapists, though for my part I have always experienced complete collaboration from every orthopaedic surgeon with whom I have worked.

The letter signed by the president and secretary of the British Orthopaedic Association and others states: "The blue lights and red lights, the long waves and the short waves, which loomed so prominently in the past, will be relegated to their proper place." This is a particularly unfortunate statement for a fracture committee to have made, and one is forced to conclude that they have been too busy to keep themselves up to date as regards the possibilities of modern electrotherapeutics. In short-wave diathermy, correctly given, we have a most valuable therapeutic agent to assist the orthopaedic surgeon in the treatment of compound fractures and trauma of soft tissues, of which types of case there are now unfortunately such large numbers. The treatment can be given through plaster, and both speeds up the resolution of sepsis and hastens union. Further, it has the power of relieving pain. Unfortunately the Fracture Committee does not appear to have investigated this form of treatment, and would consign it to the scrapheap. The red and blue lights to which they refer have disappeared for many years, though one may venture to suggest that if the exhibition of a coloured light will produce a cure, it is just as legitimate medicine as the bottle of coloured fluid prescribed by the physician. Both are examples of autosuggestion in its most elementary form.

Undoubtedly in the past various methods of physical medicine have been employed which were quite unworthy even of the adjective "empirical." But the physiotherapists were not alone to blame. Their departments were used as dumping grounds for unwanted patients by the physicians and surgeons, who not only supplied unsuitable material but prescribed unsuitable forms of treatment. Physical medicine is now past the experimental stage and on sure foundations. Thanks very largely to the orthopaedic surgeons the science of massage, exercise, re-education, and rehabilitation is now completely rationalized. On the electrotherapeutic side the value of surging faradism has never been in dispute; short-wave diathermy, correctly applied, is of the utmost value in all septic and inflammatory conditions; local ultra-violet light promotes the more rapid resolution and healing of various skin lesions; while the slow galvanic current, used with the correct technique and in properly chosen cases, has its place in the treatment of peripheral nerve lesions. The physiotherapist of to-day has (or should have) a complete orthopaedic training and keep abreast of modern medicine and surgery. He is thus in a position to give physical treatment to every type of case and has valuable wares to offer, and in intelligent and amicable collaboration with his colleagues can give invaluable services.

This letter is not an attack on the orthopaedic surgeons, for whom and for whose work I have nothing but admiration, but an attempt to justify the physiotherapist. The art of orthopaedic surgery has now attained to so many ramifications that the orthopaedic surgeon's time is fully employed in consulting and operating. Once he has gained confidence in his physiotherapist he will be pleased to leave the direction of physical medicine in his hands.—I am, etc.,

E. J. CRISP.

London, W.1, May 31.

Medical Certificates

SIR,—All whose duty it is to issue certificates of unfitness for work must frequently recognize that a patient, while unfit for his own employment, is yet perfectly able to do other work. Unless the patient's employer is able and willing to provide him with a light job—and often this is not so—the man remains off work. This represents a wastage of man-power that the country can ill afford. Perhaps I may quote some recent examples from my own hospital.

An A.F.S. man had an operation for hernia a month previously. "There is no light work in the Fire Brigade"—this though they employ women. Am I to keep him off work for two more months?

An engineer officer in the Merchant Navy had a bomb fragment removed from the region of his shoulder-joint. He is very slow to regain abduction of his arm. He obviously cannot get back to sea but meanwhile is anxious to employ his talents in an aircraft factory. He had fixed up to do this, but his present employers pointed out that the present regulations would make it difficult for him to get back to his old job if he later became fit to go to sea again, so he still kicks his heels all day.

An ambulance driver fractured his scaphoid, and, as it happened remained in plaster for eight months. During this time his employers were unwilling that he should drive an ambulance, and did not provide him with other work. Though willing to be a fire-spotter, he was not allowed to retain the post, as such, which he obtained.

Finally the wearing of a bandage immediately disqualifies a policeman for duty, however minor the lesion.

In order to prevent this wastage of man-power, I suggest that there should be health grades in civil as well as military life, and that it should be possible to downgrade a man temporarily; that while fit for work other than his own he should be registered as such at the employment exchange, and his services utilized as occasion offered. Surely in this way we could at least obtain fire-spotters for every important building in the country.—I am, etc.,

R. L. BENISON.

London, N.6, June 7.

The Psychology of Quislingism

SIR,—In your annotation with this title (May 31, p. 823) you refer to a study I published on the unconscious sources of the phenomena. In your comment you write: ". . . However hypothetical these speculations may be, etc. . . ." I should like to say that my conclusions were not intended to be put forward as speculations, but, as was stated in the study, as results obtained from the close investigation of actual material—material of a kind which is, unfortunately, still available. It was further pointed out that, if the conclusions are confirmed by further investigations, they have an important practical bearing on the political problem of combating Quislingism, it being presumed that this is still a social desideratum.—I am, etc.,

ERNEST JONES.

London, N.W.1, June 12.

A meeting of the Joint Tuberculosis Council was held in London at the end of May, when ten committees with their conveners to deal with specific subjects were appointed. Among the questions entrusted to the committees were milk, nursing, postgraduate instruction, tuberculosis in wartime, the major surgical treatment of pulmonary tuberculosis, and the institutional treatment of children. A report from the Care and Employment Committee was considered at some length. Several members suggested that too much importance had been laid on the value of voluntary care committees, and that as time went on the value of such committees would decrease. It was also suggested that more stress should be laid on the employment of patients in sanatoriums. Ultimately the report was referred back to the committee, and a special meeting of the Council is to be called to consider the final draft, to which it is hoped to give wide publicity. A questionary was recently sent out to more than 100 tuberculosis institutions on the shortage of nursing and domestic staff. Some 70% of the institutions proved to be short of staff, and the consequences are likely to be serious unless something is done to alleviate the situation. It was agreed to summarize the figures with a view to a final report which will be forwarded to the Ministry of Health.

Obituary

HENRY WILLIAMS JEANS, M.B.

The City of Portsmouth has suffered a great loss by the sudden death of one of its most respected general practitioners, Dr. H. W. Jeans.

Son of a naval officer, he graduated M.B., B.Ch. of the University of Aberdeen in 1904. He then went to Portsmouth, obtaining the position of senior house-surgeon at the Royal Portsmouth Hospital, and afterwards becoming honorary radiologist. This specialty he did not continue with, but went into general practice, where he soon became deservedly popular both with his patients and with professional colleagues. In the war of 1914-18 Dr. Jeans served in the R.A.M.C. at home and in France. Returning to Portsmouth he resumed his practice, and took a leading part in the activities of the B.M.A., serving on the Executive Committee for many years, and becoming vice-chairman of the Portsmouth Division in 1929-30, chairman 1930-1, and on five occasions representing the Division at Annual Meetings of the Association. For many years he was a member of the Portsmouth Panel Committee, and a medical representative on the Insurance Committee. During the present war he was a member of the Local Medical War Committee.

Dr. Jeans always had the welfare of his fellow-practitioners very much at heart, and many of his colleagues have had reason to be thankful for his help and advice in solving and smoothing over the many problems and difficulties connected with medical practice. His strong personality and geniality will be much missed. He leaves a widow and a son, Major H. Jeans.

R. PERCY SMITH, M.D., F.R.C.P.

Dr. Robert Percy Smith died at Durley, Southampton, on June 4 at the age of 87. He was originally intended for a business career, but soon gave it up in favour of the profession of his choice. He was a brilliant student at St. Thomas's Hospital, winning the gold medals in medicine and obstetric medicine at the London M.B. and honours in forensic medicine. He obtained the M.D. in 1881, and nine years later was admitted to the Fellowship of the Royal College of Physicians.

After the ordinary posts at St. Thomas's Hospital he was appointed resident assistant physician for a couple of years. Shortly afterwards there was a vacancy on the staff of Bethlem Royal Hospital, and he became assistant to Dr. (later Sir George) Savage, who retired two years later and Smith was fortunate enough to be elected medical superintendent at the early age of 34. In some ways this was perhaps somewhat unfortunate because it directed Smith's interests into the administrative rather than the scientific aspects of psychiatry. Nevertheless, during the ten years of his superintendency he obtained an international reputation and was awarded honorary membership of the Società Freniatrica Italiana and the Associated Society of Medical Psychology of Paris. He was lecturer on mental diseases at Charing Cross Hospital and for longer at St. Thomas's Hospital. Dr. Percy Smith was successful as a consulting physician in Queen Anne Street from 1898 onwards, and he had an extensive practice. In 1904 he was president of the Medico-Psychological Association of Great Britain and Ireland, in 1916-17 of the Psychiatrical and Neurological Sections of the Royal Society of Medicine, and for a good many years he was the Editor of *Brain*. He was at various times examiner in mental diseases to the Universities of London and Leeds and also of the Conjoint Board. Of the British Medical Association Dr. Percy Smith was a member for fifty-four years, and he served sa honorary secretary of the Section of Psychology at the Annual Meeting of 1889 at Leeds. He was president of the same Section in 1900 at Ipswich.

"R. P." (as we used to call him) was not a prolific writer, but he wrote some of the articles in the *Practitioner's Encyclopedia of Medicine and Surgery* and occasionally in the journals. The one book of which he was part author, *The Insane and the Law*, however, was and is a most valuable work, and was, so far as we are aware, the first of its kind to deal with the whole subject in a systematic manner. It was written in collaboration with two barristers—namely, Mr. (now the Hon. Mr. Justice) J. A. Hawke and the late George Pitt-Lewis, K.C.

The most outstanding feature of "R. P.'s" character was his punctilious devotion to duty. At Bethlem he saw and spoke with every patient every day and, what is more, he made all other members of his staff go round with him and do the same. He kept copious and careful shorthand notes of all his patients both at Bethlem and in private. Moreover, he was regular in his attendance at the hospital chapel. When he resigned in order to take up consulting practice he was made a governor of the hospital, and he was regular in his attendance at the Court of Governors and weekly committee meetings even after the hospital was moved to Beckenham and right up to a couple of years ago.

Percy Smith was much in request as a witness in legal cases but it aroused his indignation when the Court stopped him from fulfilling his obligation to tell the truth, the whole truth and nothing but the truth. He was good at outdoor games, but he never allowed them to dominate his life. He played golf at Northwood regularly and continued to do so until last year. Never a publicist, Percy Smith was no seeker after fame or honours, but was himself the soul of honour, probity, integrity and candour, who never deviated an inch from that straight line of conduct laid down by his brethren for our pursuit.

W. H. B. S.

By the death of Dr. JAMES HENRY ALLAN of Thingwall Road at the advanced age of 84, Liverpool has recently lost one of its well-known and oldest medical practitioners. He was a native of Stockton-on-Tees, was educated at Stockton Grammar School, and early in his career gained the Jacob Bell Senior Scholarship at King's College, London. After qualifying as pharmaceutical chemist he became dispenser to the Children's Infirmary and Royal Infirmary, Liverpool, where he taught pharmacy and materia medica to several generations of medical students. Later, as a chemist, he established numerous pharmacies in Liverpool, and subsequently, at the age of 50, qualified L.R.C.P.&S.Ed., L.F.P.S.G., and practised medicine in Everton for many years until his retirement from the profession a few years ago. Dr. Allan was a member of the B.M.A. for many years. He is survived by his two sons, Dr. John H. Allan and Dr. James S. Allan. Another son, Captain Noel J. Allan, R.A.M.C., was killed in Mesopotamia in 1918.

The following appreciation, by E. Le C. L., supplements the obituary notice of Mr. WILLIAM FREDERICK BROOK, F.R.C.S., senior consulting surgeon to the Swansea General and Eye Hospital, consulting surgeon to the Carmarthen Infirmary and to the Port Talbot and District Hospital (June 14, p. 911). Gifted with rare surgical insight, he was a very sound, most careful, and when need arose a brilliant, surgeon (as the present writer can well testify, having administered for him some 2,000 anaesthetics) and at a comparatively early age established himself as the leading surgical consultant in West South Wales. A vigorous, alert personality, a loyal, generous colleague, a true friend, he inspired in all who knew him well feelings far deeper than mere affection. Among disabled ex-Service men, past, present, and future, Brook's name should long be treasured in grateful remembrance, for he was the founder of the British Legion Medical Advisory Committees which supply information and advice to the Ministry of Pensions and have been of untold benefit to thousands of disabled men. For some years he was hon. treasurer of the Swansea Branch and president of the West Glamorgan and Carmarthenshire County Committee of the Legion. The first of these advisory committees was that at Swansea, and while receiving enthusiastic support from some of his colleagues on the hospital staff, Brook was the originator of the whole scheme. Mrs. Brook survives him, also his two children, Acting Group Captain Arthur Brook, R.A.F., and Miss Barbara Brook, local hon. secretary of the R.S.P.C.A.

The following well-known medical men have died abroad: Dr. ALBERT BENJAMIN MCCREARY, State Health Officer for the State of Florida and Commander of the Cuban Order of Carlos Finlay, aged 45; Prof. A. C. PEREIRA, of the chair of toxicology in the University of Lisbon, aged 73; and Dr. CHARLES JOSEPH WHALEN, editor of the *Illinois State Medical Journal*, aged 72.

The Services

NAVAL AWARDS

Temporary Surgeon Lieut.-Commander William Milne Wilson, R.N.V.R. (H.M.S. *Carnarvon Castle*) has been mentioned in dispatches.

CASUALTIES IN THE MEDICAL SERVICES

Royal Navy

Surgeon Commander HENRY HURST, R.N., who is reported as "Missing, Believed Killed" in H.M.S. *Hood*, received his medical training in Dublin, at the school of the Royal College of Surgeons in Ireland, taking the L.R.C.P.&S.I. in 1917. He served in the war of 1914-18, and reached the rank of surgeon commander in 1930. He leaves a widow. He had been a member of the British Medical Association since 1928.

Temporary Surgeon Lieut. HUGH MARKS, R.N.V.R., the only son of the late Mr. Hugh Marks and Mrs. E. A. Marks of Randalstown, lost his life shortly after embarking on his first ship. He was educated at Portora Royal School, Enniskillen, and Queen's College, Belfast, qualifying L.R.C.P.&S.I. in 1939. He held the post of resident medical officer at Kilmeminster Hospital before entering the R.N.V.R. He was a member of the British Medical Association.

Missing

Surgeon Lieut.-Commander Claude Denis Delacour de Labilliere, R.N.

Royal Army Medical Corps

Major RICHARD FOWLER WARD is included as "Killed" in an Army Council casualty list published on June 11. He received his medical education at the London Hospital and qualified M.R.C.S., L.R.C.P. in 1926. He also took the M.B., B.S. degrees of the University of London in 1927 and obtained the F.R.C.S.Ed. in 1930. He had held the posts of clinical assistant to out-patients at the London Hospital, casualty officer and house-surgeon and later honorary anaesthetist, at the East Suffolk and Ipswich Hospital, house-surgeon at the Derbyshire Royal Infirmary, and clinical assistant at St. Peter's Hospital, London. Before the war he was honorary surgeon in charge of the urogenital department of the East Suffolk and Ipswich Hospital.

Lieut. THOMAS WILLIAM GREATOREX died in May from wounds received on active service in the Middle East. He was 26 years of age and was the only son of Dr. R. W. Greatorex of Halifax. He qualified M.R.C.S., L.R.C.P. in 1940.

Royal Air Force

Squadron Leader HARRY WINTON DRYERRE, R.A.F.V.R., died on June 9 in a Royal Air Force hospital in England from the result of a motor accident. He was the son of Prof. Henry Dryerre of the chair of physiology, Royal (Dick) Veterinary College, and, like his father, was a student of the University of Edinburgh, where he graduated M.B., Ch.B. in 1934. He also obtained the M.R.C.P.Ed. in 1936 and became a Fellow in 1939. He won the Crichton Research Scholarship in 1937-8. After and the Houldsworth Research Scholarship in 1937. holding house appointments at Edinburgh Royal Infirmary he became assistant pathologist to the University of Edinburgh. Before the war he was pathologist to the Edinburgh Municipal Hospitals and clinical tutor at Edinburgh Royal Infirmary. He joined the British Medical Association in 1934 and was also a member of the Royal Society of Medicine, the Pathological Club of Edinburgh, and the Medico-Chirurgical Society of Edinburgh. He contributed two articles to the *British Medical Journal* in 1939, one on the effect of desoxycorticosterone acetate and cortin on salt elimination in Addison's disease and the other, jointly with Mr. W. Hunter, on duodenal ulceration in the newborn.

Flying Officer JAMES FERGUSON HARPER, R.A.F.V.R., who was killed in a flying accident last August at the age of 29, was the younger son of the late Mr. A. R. Harper, town clerk of Renfrew, and Mrs. Margaret Harper, and was educated at the University of Glasgow, where he graduated M.B., Ch.B. in 1935. After holding resident hospital appointments in Glasgow he went as ship surgeon on a liner to the West Indies and a year later made a voyage round the world. On his return he acted as an assistant in a general practice in Perthshire for about two years. In January, 1940, he joined the R.A.F.V.R., and as he believed his services as a doctor might on occasion be more valuable if he could pilot an aeroplane he spent much of his spare time in learning to fly, and it was while practising that he lost his life.

Flying Officer JOHN ANTHONY ATWILL lost his life by enemy action in April. He was the only son of Mr. and Mrs. Lionel Atwill, and received his medical education at St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. in 1940. He was 26 years of age.

DEATHS IN THE SERVICES

Fleet Surgeon JOHNSTON HAMILTON ACHESON, R.N. (ret.), died at Torquay on May 13, aged 76. He was educated at the University of Edinburgh, where he graduated M.B., C.M. in 1887; he also took the D.P.H. of the University of Cambridge in 1910. He reached the rank of fleet surgeon in 1904. He had seen a lot of service in Africa, first with the naval brigade which landed to put down King Koko, the chief-tain, on the River Niger, in 1895 (general African service medal with clasp) and later with the naval brigade landed at Mombasa for the punishment of a rebellious chief, also in 1895, when he was mentioned in dispatches. He had been a member of the British Medical Association for fifty-three years.

Universities and Colleges

UNIVERSITY OF SHEFFIELD

At a meeting of the University Council held on June 13 the resignation of Dr. Dorothy Lewis of the post of assistant in bacteriology was accepted with regret, and Dr. Lewis was thanked for her services to the University.

The late Colonel Sir Charles Clifford, K.B.E., LL.D., by his will left a share of his residuary estate to the University of Sheffield. Since the death of Lady Clifford on May 1, the residuary estate falls to be divided between the beneficiaries. It is expected that the university will receive upwards of £50,000 after duties have been paid.

UNIVERSITY OF WALES

The Welsh National School of Medicine

The following candidates have satisfied the examiners at the examination indicated:

M.B., B.Ch.—*Medicine*: N. E. France, Vera Harris, Margaret W. Hughes, D. F. V. Johnston, W. M. Jones, Gwenllian M. Lewis, J. Lewis Monica Parry-Morton, D. K. W. Picken, J. B. Randell, H. I. Rees, Nest G. Richards, Barbara C. Roberts, Erica M. G. H. Roberts, J. H. Stranger, E. R. Treasure, Glenys J. Wade, J. Williams, O. Williams, G. A. Wright. *Pathology and Bacteriology*: N. A. Cohen, R. C. Cummin, D. W. Davies, Margaret Davies, S. C. Dymond, Elizabeth M. E. Evans, R. G. Evans, Margaret A. Griffiths, A. J. L. Haley, F. J. Hedden, R. A. N. Hitchens, H. J. Houghton, Lilian Howell, J. I. Hughes, Dorothy M. Hyde, Sarah J. Jenkins, A. M. Jones, G. N. Jones, Menna Jones, I. Mazin, Margaret E. Milter, S. Morgan, Ivy M. Morgans, Celia M. Rapport, Dilys M. Rees, J. F. Rees, Dorothy Roberts, T. H. L. Rosser, Edna E. Saunders, H. F. Sugden, Freda Thomas, Mary E. Tighe, A. K. Toufeeq, D. G. H. Tutton, Marjone Whitney, G. R. Williams, S. E. Williams.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

An ordinary meeting of the Council was held on June 12, with the President, Sir Hugh Lett, in the chair.

Examiners were elected for the ensuing year.

A cordial vote of thanks was given to the American Ambulance for their assistance in conveying specimens from the College to various parts of the country.

The subject for the Jacksonian Prize for 1942 is "The Methods and Results of Treatment in Cases of Paralysis of the Bladder following Spinal Injury."

It was reported that the Blane Medal for 1941 has been awarded to Surgeon Commander James Callaghan Souter, R.N.

The election of Sir Arthur Smith Woodward and Prof. Matthew J. Stewart as Trustees of the Hunterian Collection was reported to the Council.

Diplomas

Diplomas of Fellowship were granted to the following thirty-five candidates:

C. J. Gordon, J. I. C. Mason, W. M. Beattie, E. G. Murphy, K. E. Bond, J. C. Adams, W. J. C. Crisp, J. Swift Joly, C. P. Nicholas, A. W. Stewart, M. Albert, R. Bloom, G. H. Wooler, L. A. Ives, O. T. Mansfield, D. V. Morse, J. A. C. Edwards, J. D. Wade, B. E. C. Stanley, H. M. Goldberg, E. H. Travers, A. J. Drew, Katharine I. Liebert, L. J. Temple, H. L. Catchlove, R. S. Monro, H. E. H. Denham, T. L. J. Barry, R. V. Blaubaum, J. Henderson, N. S. Martin, T. O'Neill, F. P. Raper, A. J. Slessor, Eileen M. Whapham.

A Diploma of Membership was granted to George Kenneth Tutton, of Manchester University.

Diplomas in Anaesthetics were granted, jointly with the Royal College of Physicians of London, to the following twenty-two candidates:

Sheila M. Anderson, S. K. Bakhshi, Helen E. M. Barnes, J. T. Barr, J. D. Burrows, Margaret M. J. Conway, D. M. Dunn, Jean L. Edwards, M. Garden, W. W. Gilford, H. C. R. Gunter, C. F. Hawkins, F. Hoenigsberger, J. Ives, H. R. Marrett, G. F. Panton, C. Reid, K. Roberts, Margaret J. Rowley, H. J. A. Simmons, J. M. Smith, K. B. Thomas.

Medical Notes in Parliament

Home Guard Medical Officers

On June 11 Mr. GROVES asked whether senior medical officers were to be appointed for the larger Home Guard commands, what rank they would have, and when it would be possible for them to commence their duties. Captain MARGESSON replied that in addition to battalion medical officers arrangements would shortly be made for the appointment of zone medical advisers with the rank of lieut.-colonel wherever such an appointment was considered essential.

Captain Margesson also told Mr. Groves that the appointment of a medical officer at the War Office to make personal contact with senior medical officers of the Home Guard was not necessary The Director-General, Home Guard, was in close touch with the Director-General, Army Medical Services, on all medical questions affecting the Home Guard. No difficulty had been experienced in obtaining first-hand information where necessary of conditions in the Forces.

Milk Rationing

Major LLOYD GEORGE said on June 11 that it would be impossible to revise the milk rationing scheme so as to provide one pint of milk for all children under 16 years of age and a half-pint for all adults. The quantity required to meet the suggested ration, assuming that the whole of the ration was taken up, would be 50% in excess of the total milk production of the country at the period of the year when the milk output was at its lowest figure.

On June 12 Major Lloyd George stated that the payment of a fee for a medical certificate to obtain extra milk was not required under any regulations issued by the Ministry of Food.

Medical Services in a Civil Defence Ministry

In the debate on civil defence in the House of Commons on June 11 and 12 Dr. HADEN GUEST pointed out that stretcher parties, ambulances, and hospital organizations were administered by two Departments. He held that they ought to be joined.

Mr. HERBERT MORRISON did not accept the contention that all civil defence functions should be concentrated in one Ministry of Civil Defence. Big-scale movements of the population involved nearly every department of public health administration, and a Ministry of Civil Defence, as evacuation authority, would have to take functions from the Ministry of Health and the Board of Education. Was Mr. Brown to retain such hospitals or parts of hospitals as were required for illnesses which might happen in peace while the Minister of Civil Defence took hospitals for illnesses or injury due to the enemy? How could they cut hospitals or medical administration into two? Dr. GUEST remarked that hospital administration was already cut in two. The Emergency Medical Service, which included most of the hospitals, provided accommodation for the soldier and could also provide it for those who were injured in air raids. The Emergency Medical Service hospitals were run by the Ministry of Health and had an account with the War Department for soldiers who were taken in. He suggested that people injured by air attacks should likewise be taken in under a national scheme run by the Ministry.

Mr. MORRISON said he would concentrate all doctors under one Department so far as possible. The administration of hospitals should be under one Department. The question was, What was the proper Department? He thought it was Mr. Brown's. The Ministry of Health had experience of hospital administration and it was right that they should do it. If all the health and medical services which related to civil defence were taken from Mr. Brown and if the school medical services were taken from Mr. Ramsbotham and were handed to the Minister of Home Security the Government would be forced to surrender and revert to the old way. When the Air Raid Precautions Act, 1937, was passed, there was set up at the Home Office an A.R.P. Department in which was a hospital department and a medical department with a limited number of doctors. It became clear that the unfortunate officers of the Home Office were out of their depth in hospital administration. Sir John Anderson in 1938 made changes in that. Mr. Morrison added that although he argued strongly against the creation of one Ministry of Civil Defence, the Government did not close its mind on the matter. They must think about the shortage of expert man-power before making radical changes.

Instruction in Treatment of Gas Casualties

On June 12 Sir FRANCIS FREMANTLE inquired whether the Ministry of Health entered into consultation with the Council of the British Medical Association on the instruction of the medical profession in the treatment of gas casualties. Mr. BROWN replied that lectures to general practitioners on the treatment of gas casualties were being arranged throughout the country, through the co-operation of the British Medical Association. They would be given by medical teachers with practical experience in this special subject, and would be open to all general practitioners. An authoritative memorandum on the subject recently appeared in the medical press. A copy would shortly be sent direct to every registered practitioner in this country other than those serving with H.M. Forces.

Registration of Alien Doctors

Sir FRANCIS FREMANTLE asked on June 12 what number of friendly foreign doctors were now on the British *Medical Register*, and whether the promised number of over 100 were added each week. Mr. BROWN said the number of doctors, apart from those commissioned in the British or Allied Forces, registered as foreign practitioners under the Medical Register (Temporary Registration) Order, 1941, was 289. All were now in medical employment or had such employment which they were free to take up. The Central Medical War Committee had sent forward to the Security Departments the papers of all doctors who had furnished the required particulars, averaging eighty a week in the last three weeks. The subject was not without difficulties, but there had been considerable improvement, and the Home Secretary desired to make that improvement as great as possible.

Chronic Sick in Bombed Towns

On June 17, Sir ERNEST GRAHAM-LITTLE asked the Minister of Health how many chronic sick and bedridden patients were still housed in public health and public assistance institutions, in voluntary hospitals, and homes for incurables in London and other large cities which had suffered intensive bombing, and what effort had been made to remove such patients from dangerous areas. Mr. E. BROWN said he could not give this total without elaborate and detailed inquiry from a large number of different authorities. The desirability of removing as many as possible of the chronic sick from the vulnerable areas was fully recognized both by his Department and by the local authorities concerned. The difficulties of securing total removal, however, were considerable, in view of the urgent demands on existing accommodation for the acute sick, for casualties and Service sick, for transferred industrial workers and civil defence personnel, and for others who had an at least equal claim to priority, and the need for keeping a large number of beds immediately available for emergency purposes. Every effort consistent with the other priority demands had been made to assist the removal of these cases; from the London area, for example, it had been possible to remove some 8,000 of the senile or chronic sick so far—4,000 from public assistance hospitals, and 4,000 from those found in the public shelters and temporarily accommodated in London institutions.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

An increase was recorded in the incidence in England and Wales of the principal epidemic diseases with the exception of cerebrospinal and scarlet fevers, the incidence of which declined slightly. In Scotland, in addition to these, decreases were recorded in primary pneumonia and whooping-cough, while dysentery and enteric fever remained at their previous comparatively high levels. The only noteworthy feature in the statistics for Eire is the outbreak of typhus fever which was referred to last week.

Dysentery and Enteric Fever

Although dysentery was recorded in 29 out of the 65 administrative areas, in only 6 were there more than 3 cases, while nearly one-half of the total occurred in a single county—namely, Lancashire 35 (Blackburn 1, Liverpool 3, St Helens 2, Lancaster M.B. 6, Prestwich M.B. 1, Blackburn R.D. 7, Preston R.D. 4, Warrington R.D. 3, Whiston R.D. 8). Increases were reported in Surrey 12 (all in Bagshot R.D., compared with 1 in Banstead U.D. in the previous week) and in Hertford 6 (Watford M.B. 5, St. Albans M.B. 1) against 3 (1 each in Watford M.B., Berkhamsted R.D. and Hemel Hempstead R.D.). The London cases occurred in Wandsworth 4, and Chelsea and Islington 1 each. Essex recorded 4 cases, 2 each in Colchester and Romford M.B. In Scotland 7 areas were affected, including the burghs of Aberdeen 23 and Dundee 6, and the counties of Aberdeen 4, Lanark 4, and Renfrew 3.

Enteric fever was reported in exactly the same number of administrative areas of England and Wales as was dysentery but in none were more than 7 recorded. Counties with over 3 cases were Warwick 7 (Birmingham 4, Coventry 1, Sutton Coldfield 2); Lancaster 6 (Blackpool 1, Liverpool, Manchester, Salford, Lancaster M.B., and Warrington R.D. 1 each); Stafford 6 (Smethwick, West Bromwich, Wolverhampton, Rowley Regis M.B., Lichfield R.D. and Seisdon R.D. 1 each); Middlesex 5 (1 each in the municipal boroughs of Heston and Isleworth, Southall, Southgate, and Willesden, and in Potters Bar U.D.); London 4 (Hammersmith 2, Camberwell and Islington 1 each). In Scotland there were 5 cases of typhoid fever (West Lothian C. 2, and 1 each in the county of Inverness and the burghs of Glasgow and Greenock), and 31 cases of paratyphoid B (24 in Dundee and 1 each in Glasgow and in the counties of Ayr, Lanark, Perth and Kinross, Ross and Cromarty, Stirling, and Sutherland).

Measles and Whooping-cough

Despite the pronounced periodic fluctuations of measles notifications have exceeded those of whooping-cough each week since general compulsory notification was introduced in November, 1939; the ratio has generally been of the order of 3:1 as at present, but it has ranged from something approaching equality when notification was introduced to over 12:1 during last summer. At present every administrative area in England and Wales is affected by both measles and whooping-cough. As regards Wales, Anglesey only is free from measles and Cardigan, Montgomery, and Pembroke from whooping-cough. Essex 1,202 and Kent 1,102 have displaced Lancaster 961 and the West Riding of Yorks 559 as the counties with the highest incidence of measles, while Birmingham 504 and London 393 have similarly displaced Liverpool 107 and Manchester 71, where an epidemic persisted during the greater part of 1940. In these latter two cities whooping-cough has become prevalent—104 and 167 respectively—but it is unlikely that an epidemic of the magnitude of the recent measles epidemic will ensue. While whooping-cough is widely distributed over the whole county prevalence is nowhere very high; only in three counties do notifications exceed those of measles—namely, Cumberland 27 against 6, Northampton 82 against 27, Northumberland 114 against 105.

Typhus

During the week 13 cases of typhus were recorded in the rural district of Kilrush in Co. Clare, Eire. These occurred, with 2 deaths, among the poor overcrowded occupants of 8 out of 12 houses in the Carrowmore area. As these houses were covered with thatch it was considered advisable to order their destruction by fire rather than to attempt disinfection by the usual methods, and to seek fresh accommodation elsewhere after supervision of the contacts in hospital over the period of quar

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 24.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of *Births and Deaths*, and of *Deaths recorded under each infectious disease*, are for: (a) The 126 great towns in England and Wales (London included). (b) London (administrative county). (c) The 18 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	1941 (b)	1941 (c)	1941 (d)	1941 (e)	1940 (Corresponding Week) (a)	1940 (b)	1940 (c)	1940 (d)	1940 (e)
Cerebrospinal fever	274	16	47	3	12	275	10	87	2	19
Deaths		1	4				5	9		
Diphtheria	943	43	236	29	34	673	29	217	31	22
Deaths	25	2	5	2	4	15	1	6	2	
Dysentery	95	6	42	—	—	40	—	35	—	1
Deaths	—	1	—							
Encephalitis lethargica, acute			1	—	—	2	—	2	1	—
Deaths	6	—						2		
Enteric (typhoid and paratyphoid) fever						50	1	3	6	2
Deaths	53	4	36	6	—		—	6	1	—
	1	—	1	—	—	40				
Erysipelas			38	11	1				4	—
Deaths										
Infective enteritis or diarrhoea, under 2 years						41	11	7	9	8
Deaths	35	1	13	6	—	7 628	34	106	1	73
	13,409	393	170	1	—	3		5		4
Measles	12	1	1	—	—	114	6	21	—	—
Deaths										
Ophthalmia neonatorum	86	7	21	—	—	694	45	9	—	7
Deaths						18	3	4	—	4
Pneumonia, influenzal*	1,224	45	8	6	4					
Deaths (from influenza)	26	4	1	—	—			27	284	16
			264	24	15				16	15
Pneumonia, primary								1	—	—
Deaths		—	—	—						
Polio-encephalitis acute					1	6	—	—	1	—
Deaths		—	—	—	—					
Poliomyelitis, acute		4	—	—	—		1	1	11	—
Deaths		—	—	—	2	1		1		
Puerperal fever			4	1	—			151	14	22
Deaths	124									1
Puerperal pyrexia			4	1	—					
Deaths		—	—	—	—					
Relapsing fever										
Deaths			53	124	37	16	917	38	142	55
Scarlet fever	1,106	—	—	—	—					53
Deaths		—	—	—	—					1
Small-pox										
Deaths		—	—	—	13	—				
Typhus fever										
Deaths		—	—	—	—					14
Whooping-cough										1
Deaths	4,242	117	505	—	—	8	573	—	54	—
	22	1	12	1	—		3	4		2
Deaths (0–1 year)	351	18	73	25	18	326	51	51	34	21
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	5,265	753	680	185	170	4,552	772	659	206	154
Annual death rate per 1,000 persons living									13.2	13.3
			14.8	12.3	14.9					
Live births	5,099	456	892	406	201	7,428	1,128	966	374	253
Annual rate per 1,000 persons living									19.3	23.0
			18.1	26.9	17.6					
Stillbirths	210	16	45			246	29	31		22.0
Rate per 1,000 total births (including stillborn)									31	

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Medical News

A meeting of the Medico-Legal Society will be held at 26, Portland Place, W., on Thursday, June 26, at 5 p.m. (following the annual general meeting), when a paper will be read by Dr. Donald Blair on "Alcoholism—a Medico-Legal Survey."

A meeting of the Tuberculosis Association will be held at 26, Portland Place, W., on Saturday, July 5, at 11 a.m. Dr. H. E. Magee will speak on "Wartime Diets and Pulmonary Tuberculosis" and Dr. George Day on "Some Experiments in Diet." At 2.30 p.m. Prof. H. J. Seddon will discuss "Joint Tuberculosis with Special Reference to the Spine and Sacro-iliac Joints."

At a council meeting of the British Medical Students Association in Cambridge on July 5 and 6 the speakers will include Dr. Trueta on "The History of War Surgery," and Dr. Sinclair-Loutit, medical officer, Civil Defence, Finsbury, on "A.R.P. and Students." The agenda for the business sessions includes discussion on the recommendations to be made to the Medical Planning Commission on medical education, in accordance with the invitation of the chairman, Mr. H. S. Souttar. The conference fee is 22s. a head. All are welcome. Particulars from 3, King's Parade, Cambridge. Registration by June 23.

It is anticipated that with the extension of facilities for the treatment of fractures under the Emergency Hospital Scheme there will be an increased demand for trained occupational therapists. The Ministry of Health, therefore, has arranged for the Dorset House School of Occupational Therapy to give special shortened courses of six months' duration to qualified masseuses at the Barnsley Hall Emergency Hospital, Bromsgrove, Worcestershire. About twenty such masseuses from hospitals in the scheme will be accommodated at Barnsley Hall, will receive free board and a personal allowance of £25 for the six-months course. They will not be expected to pay any fees or charges in connexion with the course or with the diploma which they will take at the end, but they will be required to serve in hospitals in the Emergency Hospital Scheme afterwards. The first course will begin on July 1, and hospitals in the scheme are asked to bring the arrangements to the notice of any masseuses they employ. Especially should hospitals with orthopaedic centres at once see whether they can release any masseuse for training with a view to her re-appointment at the hospital afterwards. Forms of application, which should be made promptly, and further details accompany Circular 2389, which the Ministry has sent to local authorities and hospitals.

The name of Dr. John James Mackenzie, medical officer, First Aid Party Depot, Glasgow, has been brought to notice for brave conduct in civil defence.

Dr. Herbert S. Gasser, director of the Rockefeller Institute for Medical Research, will receive the honorary degree of doctor of science at the eighty-eighth commencement ceremonies of the University of Wisconsin on June 23.

Among the items proposed for admission to the new *United States Pharmacopoeia* are whole blood, normal serum plasma, and normal human serum.

According to the *Schweizerische Medizinische Wochenschrift*, the academy for naval medical officers founded at Kiel last year has been removed to Danzig.

By the Workmen's Compensation (Industrial Diseases) Order, 1941, the schedule of industrial diseases (Workmen's Compensation Act, 1925) is extended to include poisoning by chlorinated naphthalene or its sequelae, and poisoning by methyl bromide or its sequelae.

A fully equipped first-aid post, which can easily be converted into a 25-bed emergency hospital, has been established at Tel-Aviv by the Polish Red Cross.

Following representations by St. Dunstan's, the Director-General of Medical Supplies for the Union of South Africa has agreed to arrangements being made for all eye casualties among the British, New Zealand, Canadian, and Australian Forces in the Middle East to be sent to Capetown.

A severe epidemic of measles has recently been reported in Turkey necessitating the closure of schools in different parts of the country.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

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B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Ragged Finger Nails

"F.R.S." (Minehead) would welcome suggestions on the following case. A lady, now in the late fifties, is worried about the state of her finger nails. As they grow or try to grow they become rough at the edges and inclined to peel or split, making them unsightly. They have been certainly worse since last Christmas. The skin is dry, but hair is in good condition and the toenails are not affected. The general health is on the whole good, but she has occasional attacks of paroxysmal tachycardia. These are now only infrequent and slight. She has a tendency towards Raynaud's disease, one or two fingers easily going "dead," especially this last winter and spring. Possibly this affects the nutrition of the nails. She is active and energetic and does a good deal of housework and cooking. Digestion is a weak point and she herself puts all her troubles down to "acidity." I am retired and not in a position to know if the restrictions on fats and food generally are affecting other people in this way. The water here is on the soft side.

Post-herpetic Pain

Dr. J. MCNAMARA (Kensington, W.) writes: Your correspondent "M.B., B.S." (June 7, p. 876) asks for advice in treating post-herpetic pain. He will get satisfaction from a pill containing 1/4 to 1/2 grain of extractum cannabis indicae given three times daily. Fifteen grains of phenazone also frequently gives relief.

Income Tax

Share of Trust Income

"A.C.B." is entitled to a share of trust income as from March 4, 1940. He has received a copy of the trust accounts for the period to May 23, 1941, a cheque for £57 and an income tax certificate for the period to April 5, 1941, showing "share of gross income £125, tax paid £50, payments made *nil*."

* * The difference between the periods covered by the account * and the certificate and complications with regard to capital receipts and payments apparently render it impossible to reconcile the figures without detailed examination of the facts. "A.C.B." can, however, assume that the income due to him for the year to April 5, 1941, can be reckoned for income tax purposes as income of that year, at whatever date or dates it reached him, and he can make a claim to repayment accordingly. It is quite possible that a copy of the trust accounts has been lodged by the trustee with the inspector of taxes with whom he deals, and in such a case "A.C.B.'s" inspector of taxes can obtain the necessary particulars through his colleague.

LETTERS, NOTES, ETC.

Abdominal Symptoms after Opium

Dr. JAS. SCOTT (Glasgow) writes: I have been interested in the correspondence in the *Journals* of February 8 (p. 215), March 22 (p. 461), May 3 (p. 655), and May 17 (p. 763). When a medical student, a fellow student recommended me to take 10 grains of Dover's powder for a bad head cold. I did so, and about an hour later I had an uncomfortable feeling in the epigastrium. This lasted a few seconds but rhythmically returned, becoming more severe each time. The pain was not that of an ordinary colic but like the "clawing of an animal" in one's abdomen. Later I got relief by vomiting. Some years later, being particularly anxious to stop a cold, I thought I would again try a Dover's powder. I did so, with the same results as before. This time I thought I would get rid of the powder by means of a dose of apomorphine. I certainly got rid of the Dover's powder quickly, but the apomorphine did not seem to know when to stop and my stomach continued to be "fliped" until I was a collapsed perspiring mass. I have come across two patients with this idiosyncrasy to opium. I was rather nervous when 1/4 grain of morphine was suggested for acute sciatica, but fortunately this gave instant relief with no unpleasant symptoms.

SUPPLEMENT TO THE
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GLOUCESTERSHIRE'S CASUALTY SERVICES: EMPLOYMENT OF LOCAL DOCTORS

BY

H. KENNETH COWAN, M.D., D.P.H.
County Medical Officer of Health

The original conception of the A.R.P. casualty services was based on an *ad hoc* service, comprising first-aid parties and ambulances, fixed first-aid posts, mobile units, and, in rural areas, first-aid points. Medical officers were attached to the fixed and mobile posts, but the first-aid parties were intended to proceed to the scene of the incident and there render first aid to casualties before removing them to hospital or the first-aid post or to their homes. It appeared fairly obvious that in practice difficulties were likely to be experienced by the first-aid parties in the correct classification of casualties for disposal, and also because their first aid did not include the administration of drugs to alleviate pain or minimize shock. It was not, however, until actual experience had proved the need that steps were taken to ensure that doctors might be permitted to attend at incidents officially and be paid for their work—in other words, that the general body of doctors throughout the country should have an official place in casualty service schemes.

It has not been difficult in towns and urban areas to supplement official facilities by the employment of doctors at incidents. In rural and semi-rural districts there is an even greater need for a doctor to treat casualties on the spot, but the difficulties of working the local practitioner into the official services are considerably magnified. Distances are greater, it is not possible to assemble a number of doctors at a central post, and arrangements must be made to ensure that the appropriate doctor is notified immediately that his services are needed.

In Gloucestershire a scheme has been devised for the employment of local doctors to supplement the official casualty services in the county, and the doctors have signified their willingness to co-operate. The official services comprise eight fixed first-aid posts, ten mobile units, 150 first-aid points, and ninety-three first-aid parties. The area of the county is some 750,000 acres, and the population with the addition of evacuees is in the neighbourhood of 400,000. The county is divided for A.R.P. purposes into sixteen areas, each with a *local subcontroller, who is in operational control of his area* and has his quota of services to deal with air-raid incidents. Each area is divided into a series of wardens' sectors, with a head warden in charge and an appropriate number of local wardens.

Scheme in Detail

The scheme, which has been adopted by the County Emergency Committee and is now in operation, is as follows:

1. The county has been divided into areas based on wardens' sectors, and groups of parishes have been allocated to local doctors in accordance with the schedule accompanying the scheme.

2. When an incident occurs in which there are casualties the Control and Report Centre, in addition to putting existing services into operation, will notify the appropriate doctor for the locality concerned.

3. The doctor will proceed to the scene of the incident and co-operate with the first-aid party or parties, and, if necessary, request the Control Centre to send the mobile unit.

4. No equipment will be supplied to the doctors in view of the fact that the equipment of the first-aid parties will be available. Drugs which may be used by the doctors—for example, morphine—will be supplied by the doctors from their own stocks, and replacements will be issued from county stores.

5. Arrangements will be made to pay the appropriate fee to a doctor called officially to an incident, in accordance with these arrangements.

The schedule sets out the parishes in each of the sixteen areas, with its appropriate sectors, the name of the head warden, and of the doctor or doctors on call for each sector. A copy of the schedule is in the hands of the subcontroller at the Control and Report Centre, and the relevant extract is also in the possession of each head warden. When the services are put into operation, the Control Centre calls the appropriate doctor to the incident, or the warden may do so to avoid delay and inform the Control Centre of his action. The system is therefore of the simplest nature, does not interfere with the operational control of the other services, and does not admit of confusion as to which practitioner should be called to attend in any particular parish. Subcontrollers, wardens, doctors, and first-aid parties are all aware of their duties, and the doctors of the county now have an official place in the casualty services. Although at present it is not possible to issue steel helmets and civilian duty respirators to doctors, representations on this subject have been made, and it is hoped that the principle of "official personnel" will be applied to medical men in the county and that they will receive a free issue of this equipment as members of the casualty services.

Correspondence

State Medical Service

SIR,—In his letter (*Supplement*, May 31, p. 71) Dr. Oliver Sloan makes a welcome effort to bring the debate on the "free choice of doctor" from the academic to the practical plane. He rightly insists that the "no-free-choice" policy must be defined and its consequences fully recognized. The advantages to doctors of a State Medical Service in the shape of fixed hours, holidays, opportunities for study, secure incomes, and retiring pensions are fully emphasized, but little is heard of the restrictions of individual liberty which may or will qualify this attractive programme; and until these are presented the debate cannot be an informed one. Obviously the State doctor cannot be free to select his area of practice. May he, in addition, be liable to be instructed from above that certain forms of practice are approved and others disapproved? Or that particular forms of illness or of injury—for example, scalp wounds—must be transferred to authorized institutions or selected practitioners? In short, are the present independence and responsibility of the practitioner liable to be displaced by an official code which will direct and review his personal decisions and professional activities? Equally necessary for satisfactory discussion is a definition of the effects of the loss of "free choice" on the liberties of the patient. Will he lose the right to change his doctor? If, when he is ill, he is ordered to hospital must he submit, or take the consequences of refusal? And with fixed hours of duty for the personnel of the medical service, must the sick man be prepared for different advisers at different times in the twenty-four hours? What, if any, are the advantages to be set against these restrictions on professional and public liberties?

Dr. Alfred Cox (*Journal*, May 24, p. 796) is anxious that the broad issue shall be presented to the choice of the profession and of the public. Doubtless he will agree that this choice can be fairly made only when the meanings and consequences of the relevant terms are fully defined and appreciated; no one is more competent than himself to set the opposing points of view in clear contrast. He deems the debate to be an essential preliminary to any attempt at medical planning; let him tell us the Pro and Con.—I am, etc.

Hove, June 1. C. O. HAWTHORNE.

SIR,—Dr. Alfred Cox in his letter regarding the institution of State Medical Service in this country issued virtually an appeal that this important subject should receive a suitable response from the profession. As one of the so-called diehards who opposed the National Health Insurance Act in its present form since its inception, I am equally opposed to the inauguration of a State Medical Service and for more or less similar reasons. My reasons were that National Health Insurance was a gross interference with the freedom of the individual, and it would in no way benefit the general health of the worker: Friendly Society statistics can demonstrate that fact; that National Health Insurance would lower the prestige of medical men and the practice of medicine to a commercial undertaking, which it has done, and has also lowered the standard of medical practice; that free choice of doctor was an anomaly and only existed on paper: for a patient to change his doctor required so much red tape that patients would refuse to use it, which is the case.

But we who opposed National Health Insurance saw in this measure the furtherance of State socialism, which would extend its growth and swamp the whole edifice on which the democratic ideal was founded. Would anyone deny that freedom of patient and medical man has been restricted, and that such restriction of freedom is now being increased by extending the Act to "black-coated workers"? During the present epoch there is a growing tendency for tradition, which holds much of benefit to the human race, to be swept aside and replaced by something of an experimental order which has nothing but a hypothetical foundation.

Medical officers of health in general appear to be more or less unanimous in their support of the establishment of a State Medical Service: but it may be pointed out that those members of the profession, although doing necessary work in their particular sphere, have little or no experience of the complexities of general medical practice, where patients are not treated *en masse* but as individuals possessing various idiosyncrasies which only experience, keen observation, and sympathetic understanding can treat.

It is time, I think, that medical men, who are supposed to represent an educated section of the community, should enlarge their vision. They might see, in further extensions of National Health Insurance and the establishment of a State Medical Service, merely a further inroad on the freedom of the individual and a step nearer a totalitarian system, which is the real enemy of a true democracy and which we are at present shedding much blood and treasure to destroy. We have not yet attained the democratic ideal; but successive Governments within recent years have been steering in the opposite direction and making men and women mere vassals and governed by a code book. If we still adhere to the gospel that democracy is essential, which I hold it to be, for the highest welfare of humanity, it is necessary that the situation be reviewed, and before introducing new measures these should be subjected to careful analysis and made to conform entirely to the democratic State; otherwise we shall drift further on the road to complete State domination of the individual.—I am, etc.,

Edinburgh, June 1. FREDERICK PORTER.

SIR,—It is interesting to read the many letters that you have published on a State Medical Service, and I hope that the members of the Medical Planning Commission are taking steps to file the many suggestions that have been made. It is also encouraging to note that efforts have already been made to widen the representation on the Commission. It would appear that some, at least, of your correspondents pay too much attention to the details of a plan which has barely been conceived, instead of aiming at certain principles which should guide the profession in formulating a scheme for State Medical Service. I should like the opportunity of putting down one or two of the principles that I feel we should aim at.

Our first aim should be unity within the profession. There seems little doubt that each branch of the profession has its own axe to grind, whether it be the specialist branch, the general practitioners, medical officers of health, officers of the State-aided hospitals, or any other branch not named, and I should like to put forward a plea that we should remember our common origin, and that this should promote a bond between us all. As an example of this lack of unity I would suggest that it is impossible for medical officers of health, who are paid by county, urban, or rural district councils, to give whole-hearted support to the profession and to the country at large when their means of livelihood depend upon their good will with their respective councils. They should be part of the State Medical Service and paid by the State. It would be a great help in attaining this unity if all doctors after qualification served a year doing hospital appointments and then some time in general practice before passing into one of the special branches of medicine mentioned above; and they should be chosen for these respective positions according to their aptitude and qualifications, perhaps by their colleagues.

The second aim should be to divorce medical benefit from sickness benefit, so that the profession would have sole and complete control of the State Medical Service. The implications of this are obvious, at any rate to those who have served as National Health Insurance practitioners.

Thirdly, we ought to aim at preserving private practice within the State Medical Service. This can be done by following the procedure carried out in Denmark, the country which before its occupation was the most advanced democratic country in the world, and whose conception of State Medical Service appeals to me as the nearest approach to the ideal. The first thing the Danes recognize is the great difference between town practice and country practice. In their large towns the area is divided into sectors, and a doctor is appointed to each sector by the Government. Every individual in the sector can obtain the State Medical Service from the doctor of that sector, but the individual can go privately to one of the other State doctors in another sector if he or she wishes to do so. This preserves the independence of the individual and the status of the medical practitioner.—I am, etc.,

Wadhurst, Surrey, June 1. H. J. FULLER.

SIR,—As the advocates of a State Medical Service have become rather vocal in your columns of late, may I take the opportunity to endorse the opinions of Dr. D. Murray Bladon in his very sensible letter in the *Supplement* of June 14 (p. S2). During fifteen years of medical practice I have never yet come across a medical practitioner who desired such a scheme. Moreover, the treatment that insurance practitioners have received from the Ministry of Health should make them very wary indeed of any extension of the panel system to dependants.—I am, etc.,

Leamington Spa, June 14. SYDNEY D. POVEY.

Overworked and Underworked Doctors

SIR,—It must be evident by now that neither the Government nor the B.M.A. is going to do anything about this problem, so either it will continue and some men die of overwork whilst others face bankruptcy, or the rank and file of the profession must combine locally to help themselves. For this purpose I suggest the temporary formation of big partnerships in the evacuated areas, a dozen or more practitioners joining forces for the duration of the war, and, say, a year after it. No money need change hands, but each man would draw a share proportional to his pre-war income. Suppose it was found that six men could run the combined practice, each other member of the partnership would take up an assistantship in the busy rural areas, pay his salary into the practice pool, and draw from it his proportion of the total earnings after the practice expenses had been met.

There will doubtless be many who will object to leaving their homes and going off into the country to act as assistants, but there is no reason why partners should not relieve each other from time to time. And where salaries are concerned, a big firm would have better bargaining power than individual men. After the war the "rural assistants" would come back to the town, and would have a year of partnership in which to pick

up their own practices again before splitting up into smaller units should they wish to do so.

Of course, the question of death or disablement of one or more partners would have to be faced. Each big partnership would work out its own scheme. The big partnership could be started anywhere at any time. No partner need know the pre-war income of any other partner; he would simply submit his audited accounts to the partnership auditor, who would assign him an index denoting his share of the total income. The incomes would be smaller than pre-war, as the "rural assistants" would be earning less, but they would probably be more than they are now, and both the town and the over-worked country doctors would be able to get half-days, and possibly occasional holidays.—I am, etc.,

FREWEN MOOR.

Norwich, June 2.

Functions of Works Doctors

SIR,—The rapidly developing situation arising from the widespread appointments of works doctors needs attention before it is too late. I have within the last week had the following experiences. A panel patient has been treated for six days by a works doctor and then referred to me. A panel patient has been given a London panel prescription, although she lives and works in Middlesex. The prescription was signed by the works doctor. Many obvious points are raised here. Another panel patient had in her possession two panel prescriptions—one from the works doctor and one from me.

The final case is the most important. I saw a panel patient for the first time on Tuesday and arranged for her to go to hospital on Wednesday for investigation. She attended and time for x-ray examination was fixed. Later in the day she returned to work and was seen and examined by the works doctor, who wrote me a letter, suggesting a diagnosis and an investigation at another hospital. I understand that the rule that a doctor must not examine a patient already under treatment still holds, and suggest that the profession must act very quickly if it is to stop a very dangerous situation develop-ing which can do no good to anybody, least of all to the unfortunate patient.—I am, etc.,

R. W. COCKSHUT.

Hendon, N.W.4, June 5.

Free Choice of Doctor

SIR,—Dr. Alfred Cox has contributed (May 24, p. 796) one of his always valuable letters on the question of free choice of doctor. In his concluding paragraph he just refers to the old tradition of the family doctor, which has always been regarded as almost a principle of medical practice in itself. No one, I am sure, will dispute the value of each of these ideals, or the importance which should attach to them in the consideration by the Planning Commission—or any other body—of the future of the medical profession. But I think it is very seldom that it is recognized that under modern methods of medical practice these two ideals are really antagonistic and very difficult to reconcile in practice. I maintain that it is so.

In the really rural districts the family doctor tradition is more likely to survive; not so in the urban areas. Dr. Cox says: "I stand for the right to choose my own doctor for myself, and believe it to be in the general interest." That is undoubtedly so. But I would ask my old friend: What would his father have said to him if at the age of 16 Alfred had said: "I'm tired of old Dr. Brown: you can go on having him if you like, but if I want a doctor I am going to have Dr. Jones"? I know what my father would have said to me; and he would have been right. But that is largely the position to-day. The great majority of the population of this country are insured persons under the N.H.I. Acts. As such they enter into insurance at the age of 16, when they are supplied with a medical card entitling them to take it to any panel doctor whom—for any reason—they prefer. Now is it likely that at that age they will be in a better position, in their own interests, to make a good selection than the parents who have had one doctor for many years to attend themselves and the children? I believe the truth to be that where the new entrant into insurance selects a different doctor from the one who has been the family doctor all along, the last thing he or she thinks about is the worth of a doctor from the pro-fessional standpoint. Propinquity, the desire for change, the fact that some friend has said what a nice fellow that new young doctor round the corner is—these are the considerations that prompt them to exercise their free right of choice if they ever give any consideration to the matter at all.

All this may not apply so much to the better-off class of patient. There the family doctor tradition is more likely to continue. The young entrant into insurance is quite content to place himself on the panel of the doctor who has attended him all along whenever he needed attention. And when he becomes older and leaves the old home to set up for himself, and perhaps is no longer an insured person, he is more likely to stick to the old practitioner than to choose another merely in order to exercise the grand privilege of choosing his own doctor. If he wants to do so, of course he has the right of every free man to his own free choice. But as things are I fear the principle of "free choice" has become more a sort of shibboleth or slogan than a principle to be appreciated and put into ordered practice by those most concerned.

In considering all or any suggestions that may be put forward for ensuring an adequate Medical Service for all the inhabitants of this country, I think attention should be paid to whether or how far it is possible to reconcile these two matters; to afford at least to all who are old and experienced enough to exercise it the right of free choice of doctor; and at the same time to encourage the maintenance of the old tradition of the family doctor. And I believe that even under some form of State Medical Service much could be done to reconcile these two interests, to the benefit alike of the public and the pro-fession.—I am, etc.,

JOS NELSON.

Hull, June 2.

Medical Services of H.M. Forces

Appointments

ROYAL NAVY

Surgeon Lieut. J. Lees to be Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Probationary Temporary Surgeon Lieuts. A. E. A. Shaw, A. M. Blackstock, F. McL. McGown, and G. A. S. Anthony, to be Temporary Surgeon Lieutenants.

ARMY

Lieut.-Colonel (temporary Colonel) S. M. Hattersley, M.C., from R.A.M.C., to be Colonel.

ROYAL ARMY MEDICAL CORPS

Lieut.-Colonels C. E. W. S. Fawcett, retired pay, C. Seaife, retired pay, and D. P. Watson, D.S.O., retired pay, have reverted to the rank of Major at their own request whilst employed during the present emergency.

Lieut.-Colonel D. C. G. Ballingall, M.C., has retired on retired pay on account of ill-health.

Majors (Acting Lieut.-Colonel) J. M. MacKenzie, O.B.E., M.C., and (Temporary Lieut.-Colonel) H. J. Benstead, M.C., to be Lieutenant-Colonels.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Captain (temporary Major) P. G. Tuohy to be Brevet Major, under the provisions of Article 163, Royal Warrant for Pay and Promotion, 1940.

Lieut. (War Substantive Captain) C. G. Harper, from Gordon Highlanders, Reserve of Officers, to be Lieutenant (War Substantive Captain).

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Major W. J. C. Watt, having attained the age limit, has relinquished his commission and retains his rank.

War Substantive Major N. H. Leslie has relinquished his commission on account of ill-health and retains his rank.

Captain E. H. Jaques has relinquished his commission on account of ill-health.

LAND FORCES: EMERGENCY COMMISSIONS

ROYAL ARMY MEDICAL CORPS

Captain B. P. O'Hara has resigned his commission (Substituted for the notification in the *Supplement* to the *London Gazette* dated May 13.)

War Substantive Captains D. Barclay, O. G. Bark, G. Henry, J. E. Ryan, and K. R. Thomson have relinquished their commissions on account of ill-health.

Temporary Captain J. L. Arran has relinquished his commission on account of ill-health and resumes the rank of Captain.

Lieut. G. A. Beggie to take rank and precedence in R.A.S. Corps and in the Army as if his appointment as Lieutenant bore date April 2, 1941.

Lieuts. R. E. Newman and W. Campbell have relinquished their commissions on account of ill-health.

The surnames of Lieuts. R. W. Meller and A. W. Kinchant are as now described and not as stated in the *Supplement* to the *London Gazette* dated May 2.

The notification regarding Lieut. A. W. Hammer in the *Supplement* to the *London Gazette* dated May 2 is cancelled.

Major H. H. R. Bayley, from temporary commission, to be Lieutenant.

To be Lieutenants: J. V. Craig, J. S. Leigh, T. T. Micin, W. J. Wright, J. Janner, R. Kells, W. R. Kenyon, R. V. Rhoda, G. G. Robertson, H. H. Davies, D. Mitchell, J. G. O'Mahoney, P. V. Bailey, W. N. Calder, J. A. Learner, A. Young, J. F. E. Waller, A. H. Bailled, W. N. Lacey, H. H. Davies, R. L. G. Dawson, W. G. Edwards, W. A. Frost, J. W. Lacey, A. M. Beemer, L. B. G. S. Mansell, A. Ramage, H. Upshon, D. Adler, A. M. A. Beemer, A. J. Berry, H. A. Blackford, J. H. Brodie, C. A. Brown, R. Christie, R. M. Brennan, W. Feries, J. W. Gorcsny, P. R. Graves, T. W. Green, R. M. Halahan, J. J. A. Hamilton, N. A. Jewers, F. F. King, A. W. C. Lobban, J. G. Macleod, A. Noble, B. Oppenheim, W. L. Paterson, A. M. Stewart, R. Bamber, G. B. Macaulay, A. Murray, A. L. Rawson, R. J. Rowland.

G. [illegible] 'alder, J. H. C. Corr, J Dawson, A. M. Dickson, W. [illegible] P M James, K. C. Kershaw, A. M. MacDonald, G. [illegible] ''cNicol, A. L. R. Mayer, G. A. Mogey, J. J. O'D[illegible] J. N. Stirling J C. T. Sykes, A. W. Douglas, J. J. McCarthy, D. P G. Paisley, F. J. Beaton, J. R. Bodington, E. W. Jones, E. J. Kerr, M. Leibson, J. E. T. Munn, F. L. H. Voller, L. A. C. Wood, R. B. N. Wilsdon, H C. Allan M. Beaton, D. Belchover M G. Braham, R. H. Butcher, R G. Drummond, A. A Evangeledes, A. C. C. Evans, A. Franklin, F. J. Gillingham, A. Giordani, A S Hollins, A. G Hooker, J. L. Linacre, R. W. McClements, A. McConnell, C. T Macdonald, A. F. McGlashan, I. H Milner, W. J. Mohat, W. H. Murray, P. O'Callaghan, F. L. Potter, J. K. Samuel, W. M. Smith, J. B Sugden, T. D. V. Swinscow, W. T. Thom, J. R Tocher, L. Werbeloff, G. R Wightman, D. Wilson.

ROYAL AIR FORCE

Group Captain H. A. Hewat to be Air Commodore (temporary)

Wing Commanders T. J. Thomas, W. E. Barnes, J D. Leahy, E. C K. H Foreman, and W. J. G. Walker to be Group Captains (temporary)

Squadron Leaders R. S. Topham, L. P. McCullagh, D. A. Wilson, H. C. S Pimblett, J. Kemp, P. J. McNally, G. H. J. Williams, J. F. McGovern, C. Crowley, and G. O. Williams to be Wing Commanders (temporary)

Flight Lieuts. F. I. G. Tweedie, A. M. Weston, J. F. Sandow, L. E. A Dearberg, G. H. Stuart, L. M. Corbet, C. F. R. Briggs, and A. S. Burns have been granted the War Substantive rank of Squadron Leader.

Flight Lieuts. J H Cullinan, J. L. Walsh, J. F. Dales, L S. Everett, H. Bannerman, G. Gilchrist, G. H. Morley, J. C. Blair, A. W. Smith, J. W. Patrick, J. S. Wilson, H. L. Wilcox, and P. A. Cooper to be Squadron Leaders (temporary).

Miss Patricia G. Cooper and Miss Sheilagh M. C. Murray have been appointed as Medical Officers with the relative rank of Flying Officer.

ROYAL AIR FORCE RESERVE

Squadron Leader A. T. G Thomas to be Wing Commander (temporary).

Flight Lieuts. R. F. T. Grace, J C. Smyth, D Magrath, R. F W Fisher, W. J. Hutchinson, and E. Donovan have been granted the War Substantive rank of Squadron Leader.

Flight Lieuts. C. McC Jones, W. D. Miller, E. G. Howell, L. A. Rice, R. F. MacLatchy, J. L. Groom, A. R. French, E. W. B. Griffiths, W. A. Beck, M. D. Rawkins, and T. A G Hudson to be Squadron Leaders (temporary).

Miss Mary Calvert and Miss Kathleen E. A. Smith have been appointed as Medical Officers with the relative rank of Flying Officer.

AUXILIARY AIR FORCE

Squadron Leader J. C. H Allan to be Wing Commander (temporary)

Flight Lieut. J. H. Williams has been granted the War Substantive rank of Squadron Leader.

Flight Lieuts. D. A. Smith, I. A. G. L. Dick, C. W. Kidd, J. P. Huins, I. R. Jones, T. McM. Boyle, J. H Attwood, W. D. Coltart, and W. D. Pecock to be Squadron Leaders (temporary).

Flying Officers R. J. H. Raines and J. D Crerar have been granted the War Substantive rank of Flight Lieutenant. (Substituted for notifications in the *London Gazette* of October 8, 1940, and May 28, 1940, respectively.)

AUXILIARY AIR FORCE RESERVE OF OFFICERS

Flight Lieuts. A. C. Fraser and H. W. Walter to be Squadron Leaders (temporary).

ROYAL AIR FORCE VOLUNTEER RESERVE

Squadron Leaders C. W. Flemming, G. L. M. McElligott, F. W. Roques, J. F. Simpson, D. H. Brinton, S. Cade, R. R. Trail, J. G. Skeet, T. K. Lyle, E. T. Cato, N. K. Henderson, and R. N. Ironsido to be Wing Commanders (temporary).

Squadron Leader J. M. Bickerton has resigned his commission.

A. G. Cross and A. M. Stewart-Wallace to be Squadron Leaders

Flight-Lieuts. H. C. Purcer-Smith, G. P. Smith, A. W. Badenoch, G. A. Jamieson, J. T. Linklater, G. M. Rose, H. F. Squire, R. D. Bruce, T. G. Hovenden, T. J. B. A. MacGowan, L. V. McNabb, D. F. E. Nash, H. B. Bagshaw, H. W. Dryerre, F. P. Forrest, J. A. Pecock, K. J. Thomson, H. McD. Walker, A. G. Wilson, and C. J. Shortall to be Squadron Leaders (temporary).

Flight Lieuts. L. G. Scoular, J. Wingate, K. Robson, R. W. Durand, J. Tate, and W. Milligan have been granted the War Substantive rank of Squadron Leader.

F. J. P. O'Gorman to be Flight Lieutenant.

Flying Officers A. H. Baynes, A. Maclaine, E. S. Nicholson, W. H. C. Spooner, W. A. Jones, E. A. K. Hoppins, H. I. Baigel, T. W. Branch, W. P. D. Logan, R. S. Nicholson, D. L. Bennett, A. M. Goldthorpe, J. M. MacCormack, A. O'Connor, I. H. Taylor, J. S. Wood, B. H. Goodrich, G. A. Scott, S. Bender, D G Evans, A. H. Thomson, H. D. Welch, and C. F. Bose have been promoted to the War Substantive rank of Flight Lieutenant.

Flying Officers L. O'N. Knox, N. K. B. Kimbell, and J. N. MacDonald have been granted the War Substantive rank of Flight Lieutenant.

To be Flying Officers: D W. R. Ashby, G. R. Bedford, R. F. Browne, W. Cookson, W. N. Crow, S. Duff, P. McA. Elder, C. G. Fagg, K. M. Fox, H. R. L. Fraser, R. W. G. Grindlay, M. J. Hackett, F. W. Parke, E. A. Pask, R. Robertson, R D. Sloan, C. E. Waterman, J. N. Williams.

Flying Officer R. A. C. Macnair has resigned his commission.

The notification in the *London Gazette* of May 23 concerning E. E. Phillipp should have read E. E. Philipp.

DENTAL BRANCH

J. C. McDougall to be Flying Officer.

COLONIAL MEDICAL SERVICE

The [illegible] ounced: F. I. C. Apsted, M.B., B.S., and H[illegible] .P., Medical Officers, Sierra Leone; M. A. [illegible] I. Turner, M.R.C.S., L.R.C.P., W. J. Tyson, [illegible] M.R.C.S., L.R.C.P., Medical Officers, Malaya [illegible] Medical Officer, Nigeria; A. J. Have, M.D., [illegible] t; E. J. Thomas, M.R.C.S., L.R.C.P., Pathol[illegible] Chellapah, O.B.E., M.R.C.S., L.R.C.P., D.P.H., Director of Medical and Sanitary Services, Ceylon; M. A. Cave, M.R.C.S., L.R.C.P., P. R Cooper, M.B., Ch.B., G. R. Wadsworth, M.B., Ch.B., and R. W. Palmer, M.R.C.S., L.R.C.P., Medical Officers, Gold Coast; C. W. Davies, M.R.C.S., L.R.C.P., D. H. Manson-Bahr, M.R.C.S., L.R.C.P., and A. J. Walker, M.B., B.S., Medical Officers, Kenya; D. W. Horn, M.B., Ch.B., Medical Officer, Gambia; W. N. Kenrick, M.R.C.S., L.R.C.P., Medical Officer, Uganda; J. H. Strahan M.B., B.Ch., D.P.H., Malaria Research Officer, Federated Malay States.

B.M.A. LIBRARY

The following books were added to the Library during April and May, 1941:

Albee, [illegible] : Bone-graft Surgery in Disease, Injury and [illegible]

Avery, [illegible] cers. 1941.

Bainbri[illegible] Physiology. Ninth edition, edited and revi[illegible]

Balleng[illegible] Rhinology and Laryngology. 1940.

Blackl[illegible] : Guide to Human Parasitology for Medical Practitioners. Fourth edition. 1940.

Bogert, L. J., and Porter, M. T.: Dietetics Simplified: the Use of Foods in Health and Disease. Second edition. 1940.

Borland, D. M.: Pneumoniae. 1941.

Borradaile, L. A.: Manual of Elementary Zoology. Tenth edition. 1941.

Bourne, A. W.: Synopsis of Obstetrics and Gynaecology. Eighth edition. 1941.

Cameron, T. W. M.: The Parasites of Man in Temperate Climates. 1940.

Clark, K. C.: Positioning in Radiography. Second edition. 1941.

Clayton, E. B. Actinotherapy and Diathermy for the Student. Second edition. 1940.

Coon, G. P., and Raymond, A. F.: A Review of the Psychoneuroses at Stockbridge. 1940.

Harris, S., assisted by Harris S., jun.: Clinical Pellagra. 1941.

Heck, A. O.: Education of Exceptional Children. 1940.

Jokl, E.: The Medical Aspect of Boxing. 1941.

Jones, O. and Jones, T. W.: Canning Practice and Control. Second edition. 1941

Ladell, R. M.: The Stammerer Unmasked: a Manual of Psychology and Treatment. 1940.

Maby, J. C., and Franklin, T. B.: The Physics of the Divining Rod: An Experimental Investigation of Water and Mineral Divining. 1939.

Martin, S. M.: Speech Training for the Deaf Child. 1941.

Moodie, W.: The Doctor and the Difficult Child. 1940.

Neustatter, W. L.: The Early Treatment of Nervous and Mental Disorders. 1940

Nygaard, K. K.: Hemorrhagic Diseases: Photo-electric Study of Blood Coagulability. 1941.

Proceedings of the Seventh International Genetical Congress, Edinburgh, August 23-30, 1939. Edited by R. C. Punnett. 1941.

Rea, R. L.: Neuro-Ophthalmology. Second edition. 1941.

Soule, T. S., and Mackenzie, C.: Community Hygiene. 1940.

Steindler, A.: Orthopaedic Operations. 1940.

Tuberculosis Association of India: Transactions of the Tuberculosis Workers' Conference, New Delhi, November, 1939. 1940.

Waddington, C. H.: Organizers and Genes. 1940.

Worcester, A.: The Care of the Aged, the Dying and the Dead. Second edition. 1940.

B.M.A.: Branch and Division Meetings to be Held

WILTSHIRE BRANCH, SWINDON DIVISION.—At Victoria Hospital, Swindon, Wednesday, June 25, 8.30 p.m. Dr. Percy Phillips: Air-raid Experience in Bristol.

Postgraduate News

A course of lectures and practical demonstrations on "The Treatment of Fractures, with Special Reference to War Conditions" will be given by Mr R Watson-Jones in the Department of Surgery of the British Postgraduate Medical School, Ducane Road, Hammersmith, W., from Monday to Friday, June 23 to 27, both dates inclusive, from 10 a.m. to 5 p.m. each day. The course is limited to a maximum of 30 students, and applications should be submitted to the Dean. The course will only be held if a minimum of 15 students apply. The fee for the course is £5 5s., but a limited number of Officers of the armed Forces will be admitted free on receipt of a leave certificate.

The Fellowship of Medicine announces the following courses for Final F.R.C.S. Candidates: (1) Clinical demonstrations, 2 p.m., Wednesdays, July 2 to 23; (2) Revision course, daily, 10 a.m., July 7 to August 1; (3) Practical operative surgery, Mondays, Thursdays, and Fridays, 2 p.m., July 7 to August 1; (4) Urology course, Thursdays, 2.30 p.m., August 7 to 28; (5) Week-end course of clinical demonstrations, Saturday afternoon and Sunday morning, July 12 and 13, at King George Hospital, Ilford.

WEEKLY POSTGRADUATE DIARY

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.—*Daily*, 10 a.m. to 4 p.m., Medical Clinics Surgical Clinics and Operations, Obstetrical and [illegible] ions. *Daily*, 1.30 p.m. Post-mortem [illegible] Course by Mr. R. Watson-Jones com[illegible] .tric Clinic, Dr. R. Lightwood. *Wed.*, [illegible] onference (Medical). *Thurs.*, 2 p.m., [illegible] .in; 2 p.m., Radiological Demonstration, [illegible] n., Clinico-pathological Conference (Sur[illegible] Conference (Gynaecological); 3 p.m., Sterility Clinic, Mr V. B. Green-Armytage.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.—Royal Chest Hospital, City Road, E.C., *Wed.*, 3.30 p.m., M.R.C.P. Course in Heart Diseases.

DIARY OF SOCIETIES AND LECTURES

ROYAL SOCIETY OF MEDICINE

Section of Psychiatry—Tues., 4.30 p.m. Paper by Dr. Eliot Slater: Amnesic Syndromes in War.

Section of Urology.—Thurs., 5 p.m., Clinico-pathological meeting. Specimens.

Section of Orthopaedics.—Sat., 2 p.m., at Park Prewett Hospital, Basingstoke. Annual General Meeting 2 p.m., and 4.30 p.m. Papers

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, W.—Tues., 2.30 p.m. Discussion: The Necessity of the Clinician making the Best Use of Laboratory Facilities in the Diagnosis of Venereal Diseases, and Simple Methods of doing so. To be opened by Dr. I. N. Orpwood Price.

SHAFTESBURY MILITARY HOSPITAL MEDICAL SOCIETY.—*Tues.*, 3 p.m., Major J. C. Thomas, R.A.M.C.: The Control of Air-borne Infections in Hospital Wards.

VACANCIES

EXAMINING FACTORY SURGEONS.—The following vacant appointments are announced: Tipton (Staffordshire); Launceston (Cornwall). Applications to the Chief Inspector of Factories, 28, Broadway, S.W.1, by June 24.

APPOINTMENTS

BURN, J. L., M.D., D.P.H., Medical Officer of Health to the City of Salford.

GUNN, D., M.B., Ch.B., Examining Factory Surgeon for the Loanhead District (Midlothian).

HUGHES, T. Ll., M.D., D.P.H., Medical Officer of Health, County Borough of Barnsley.

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should be forwarded with the notice, authenticated with the name and address of the sender, and should reach the Advertisement Manager not later than the first post Tuesday morning to ensure insertion in the current issue.

MARRIAGE

TAYLOR—LATTER.—On Saturday, May 24, at Chelsea, Arthur Gordon Taylor, L.D.S.Eng., to Rosalind Brackenbury Latter, M.B.(N.Z.), M.R.C.P.Lond.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 28 1941

THE REDUCTION OF DUST-BORNE BACTERIA IN THE AIR OF HOSPITAL WARDS BY LIQUID PARAFFIN TREATMENT OF BEDCLOTHES

BY

JOHN C. THOMAS

Major, R.A.M.C.; Officer in Charge of a Military Laboratory

AND

M. van den ENDE, M.B Capetown, Ph.D.Camb.

National Institute for Medical Research, Hampstead

Until recently it had been commonly accepted that respiratory infections are spread direct by droplets disseminated from the upper respiratory tract of infected persons or carriers. Large droplets (0.1 to 1 mm.) may be sprayed for a distance of fifteen feet, but, by reason of their size, fall rapidly to the ground. Small droplets (less than 0.1 mm.) evaporate before reaching the floor and may remain floating in the air for long periods as nuclei of small clumps or as single bacteria (Wells and Wells, 1936).

That there is a third possible channel of infection, mainly on dust, is becoming increasingly obvious. It is with this method of spread that we are particularly concerned in this paper. Bloomfield and Felty (1924) demonstrated that there is relatively little or no horizontal expulsion of streptococci from the respiratory tract of infected persons. More recently (1940) Hare has shown that a considerable number of organisms stream diagonally downwards. These may be caught on the bedclothes or fall to the floor, where they dry, and may be re-projected into the air with bed-making or sweeping. Cruickshank (1941) and Thomas (1941a) have shown that large numbers of haemolytic streptococci do accumulate in hospital dust, while Wright, Shone, and Tucker (1941) have demonstrated diphtheria bacilli in the dust of their isolation wards. Until the relative responsibility of each of these methods of spread is finally determined, and especially in the abnormal conditions in which we are living to-day, it is necessary to provide adequate safeguards against all three.

We have previously shown that a very large percentage of aerial contamination from dust can be removed by treating wooden or linoleum-covered floors with spindle oil (van den Ende, Lush, and Edward, 1940; Thomas, 1941b). Van den Ende, Edward, and Lush (1941) showed that both the amount of dust and the numbers of streptococci released from infected bedclothes by beating under experimental conditions were reduced by 90 to 100% by previous treatment with a 30% solution of liquid paraffin in white spirit. This treatment of bedclothes, together with the application of spindle oil to the floor of a ward, has been found by van den Ende and Spooner (1941) to reduce the number of organisms present in the air of the ward throughout the day; the increase in the bacterial content of the ward usually accompanying bed-making and sweeping was reduced to a minimum. The ward in which their experiments were performed was, however, not ideal for the purpose, because of the interchange of dust which occurred between adjacent sections of the ward, and, furthermore, the number of pathogens recovered from the air was small.

This paper describes experiments in both large and single-bed hospital wards, in some of which there were enough haemolytic streptococci in the air to allow them to be used as indicator organisms. Owing to the nature of the infections treated in the wards it was also possible to regulate the experimental conditions much more accurately.

Bacterial Counts

1. *Air.*—The medium employed in all our experiments was 1 in 500,000 gentian-violet blood agar. For air sampling, plates were exposed in slit-machines (Bourdillon, Lidwell, and Thomas). The gentian-violet medium has been shown to be relatively selective for haemolytic streptococci (Garrod, 1933), and reduces the growth of air-borne saprophytes by 95%. Continuous counts were made with the machines adjusted to suck 1 c.ft. of air per minute. In all our diagrams each vertical block represents the count of organisms collected from 10 c ft. of air in ten minutes. Altogether 647 plates were used for these experiments.

2. *Dust.*—Dust samples were collected into sterile bottles and freed from obvious mineral matter, such as pieces of grit and coal. Amounts of 100 mg. were shaken for 15 to 30 seconds in 10 ml. of sterile nutrient broth and then allowed to settle for fifteen minutes. At the end of this period of clarification 2 ml. was transferred to a second bottle containing 18 ml. of broth and again shaken. Varying amounts (0.5 to 0.05 ml.) of this final dilution (0.1 mg. dust per ml.) were plated out into gentian-violet blood agar in duplicate. In a few cases counts of the total organisms were made on serum agar. The counts can, of course, only be regarded as approximate, and probably low, as we have counted as single organisms what may have been clumps of organisms adherent to one another or to dust particles.

3. *Bedclothes.*—Counts were made with a special extractor designed by one of us (M. v. d. E.). This consists of two flanged aluminium plates, fitting closely together with a rubber ring and held by three screw clamps set in U-shaped arms to allow for a fringe of blanket when the apparatus is assembled. In the lower plate is an inlet attached to a 50-ml syringe by a length of rubber tubing;

in the upper plate is an outlet fitted with a tap and a small glass funnel (Fig. 1). The whole is sterilized by autoclaving.

For use the two halves of the chamber are clamped on to any desired part of the material to be tested, and 50 ml. of nutrient broth is drawn backwards and forwards through the fabric some twenty or thirty times. Finally, a little of the broth is driven upwards into the funnel, the tap is closed, and aliquot parts are plated out into gentian-violet blood agar.

Tests of Efficiency of Blanket-sampling Apparatus

Known volumes of a serum-broth culture of haemolytic streptococci (Group C) were spread over the centre of 6-inch and 1-inch squares of woollen blanket material; at the same time, equal volumes were placed in empty sterile Petri dishes. The 6-inch squares were extracted with 50-c.cm. amounts of broth by means of the special

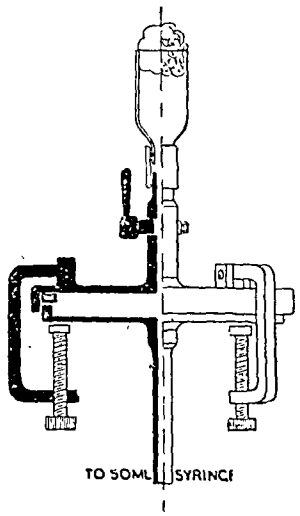


FIG. 1.—Apparatus for making bacterial counts on bedclothes or fabric materials.

apparatus, each 1-inch square was mechanically shaken with 50 c.cm. of broth in a stoppered bottle containing glass beads, and to each Petri dish was added 50 c.cm. of broth. One set of extractions was made immediately, and the second after the infected blanket squares had been dried in high vacuum over P_2O_5. The streptococci in the broth extracts were counted by the technique adopted by Miles

Table showing Experimental Recovery of Streptococci from Blankets

Impregnation	Method of Sampling		Count from Petri Dishes
	With Special Apparatus (Fig. 1)	Mechanically Shaken	
Broth culture dropped on to blanket: (a) Sample immediately .. .. .. (b) Sample after drying over P_2O_5 ..	59 millions 64 ..	60 millions 80 ..	79 millions 64 ..
Exposure to uniform mist of streptococci	5,000	5,250	

and Misra* (1938). A second test was done with circular pieces of the same woollen blanket exposed to a uniformly distributed aerosol of streptococci in a sealed room. One set of these samples, each with a surface area 4.9 sq. in. (equal to the area extracted by the special apparatus), was extracted by mechanical shaking with broth. The other samples, which were larger, were extracted with the special apparatus. The results, which are given in the accompanying table, show that there was no significant difference between the numbers recovered by the use of the special apparatus and those recovered by thorough shaking with broth. The number of streptococci recovered from hospital blankets should therefore give a fairly accurate indication of the numbers actually present.

Treatment of Bedclothes with Liquid Paraffin

For our preliminary experiments complete sets of bedclothes (1 wool-cotton counterpane, 3 blankets, 2 sheets, 1 draw-sheet, 2 pillow cases, and 1 pair pyjamas per bed) were treated at Hampstead. For our large-scale ward experiments sixteen sets were treated in the hospital laundry. Van den Ende, Edward, and Lush showed that

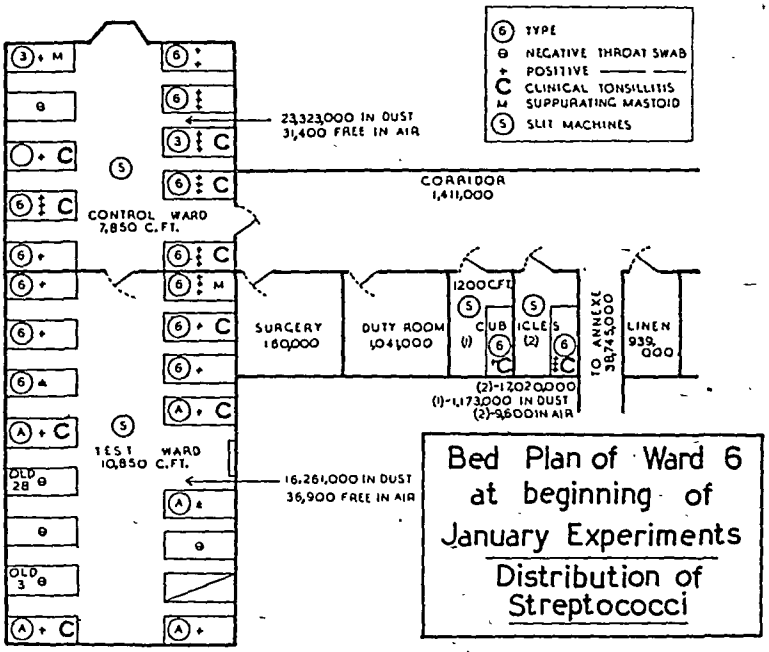


FIG. 2.

the ideal concentration of oil for treating bedding is 30%, and that with this concentration the final bedding is not oily to touch and yet contains an effective proportion of oil (blankets, 3%; bed-linen, 6 to 7%). One difficulty experienced was that the blankets absorbed so much of the parent liquor that only a few could be processed at one time unless larger volumes of oil were available.

Our "oiling party" consisted of Cpl. T. Bury, R.A.M.C., and seven others. Treatment of 160 articles (48 blankets, 48 sheets, 32 pillow-cases, 16 counterpanes, 16 pair pyjamas) fully occupied the party for three hours. Thirty gallons of the 30% solution of liquid paraffin in white spirit was placed in a large tank. The bedclothes were soaked in this solution, partially wrung out by hand, and then transferred to a hydro-extractor. Centrifuging was continued until only a thin trickle of the solution was running from the outflow. The outflow from the hydro-extractor was recovered by blocking the outlet drain and by baling from the trough while the machine was running, and was then returned to the soaking-tanks. From the hydro-extractors the bedding was put through a drying chamber which had previously been heated. In order to minimize fire risk the heat was turned off immediately before placing the bedclothes into the dryer, but the draught fans were kept in operation. Although in this experiment the sheets were not ironed, previous experience has shown that this can be done with

*This technique involves the use of glass capillary pipettes which deliver 50 drops of broth per c.cm. (see Wilson, 1922). Our pipettes were specially made for us with parallel-sided capillaries drawn to the required dimensions, and sealed into 6-mm glass tubing.

an ordinary single-bed calender. Reduction of the temperature of the steam bed minimizes the loss of oil on the roller pads.

Ward Trials

The ear, nose, and throat wards, in which our experiments were performed, consisted of a main ward divided by a glass partition and door into a 16-bed and a 10-bed section (Fig. 2). Each could be completely isolated. The larger section was used as a test ward and the smaller for control experiments. The floors in both sections were treated with spindle oil. Small single-bed isolation cubicles, each of 1,200 c.ft. capacity, were also used. Consecutive air samples, each of 10 c.ft., were taken with a slit-machine—the first three samples usually during a quiet period, to determine the minimum number of bacteria in the air. During the ten minutes in which the fourth air sample was taken the floors were swept in order to show that no dust could be raised from the oiled floors. During the sixth ten-minute period beds were made. Sampling continued until static conditions again obtained. Simultaneous counts were made in both test and control wards. To overcome the difference in size of the two wards, we made more beds in the test ward than in the control ward on each occasion. Cubicle experiments were carried out as suitable cases presented throughout the whole period.

Distribution of Streptococci in the Wards

It was found that in any ward in which there was at least one patient with a streptococcal infection of the upper respiratory tract the causal organism could be recovered from the ward air, from the floor dust, and from the bedclothes throughout the infective period. During an epidemic of tonsillitis which occurred in January there were at one time nine cases in one ward. The dust obtained from this ward in one sweeping was estimated to contain over 100 million streptococci, and on one occasion nearly 70,000 of these organisms were suspended in the ward air (Fig. 2). The ward blankets that were examined contained between a half and one million streptococci each. Colonies from each test were typed, and the majority were found to correspond to the patients' infecting organism. A few other types were recovered (particularly Types XII and XXV and a Group G Lancefield strain), although no patient or member of the staff had such types in either throat or nose. As many as 30 to 50 streptococci could constantly be recovered on any plate from 10 c.ft. of ward air. We found this count to be regularly increased by bed-making or by any manœuvre which involved disturbing the bedclothes.

Similar counts were obtained in another ward, also with an outbreak of tonsillitis, when automatically exposed plates showed increases of aerial streptococci with the service of a meal, with bed-making, and, in particular, during visiting hours (Fig. 3). Again we recovered organisms of types different from those exhibited by the inhabitants of the wards, and this seems to be most probably accounted for by their persistence upon the bedding. Analysis of bedclothes again yielded up to a million streptococci per blanket.

The increase in aerial streptococci during bed-making was even more strikingly demonstrated in single-bed cubicles, in which there is less dilution owing to their smaller cubic capacity (Fig. 4). The highest count we recorded in a cubicle was 374 streptococci in 2 c.ft. of air. Counts of 150 to 200 have often been observed in these circumstances. Dust counts were higher in these cubicles than in the wards, probably because of a greater difficulty

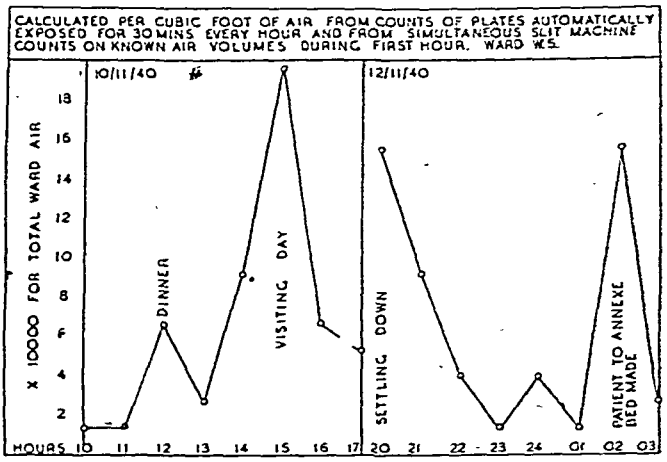


FIG. 3.—Streptococci in ward air

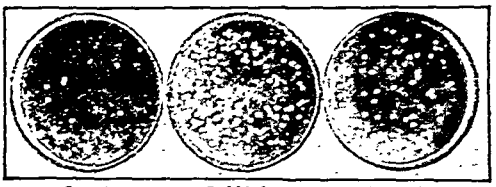


FIG. 4.—Aerial streptococci during bed-making.

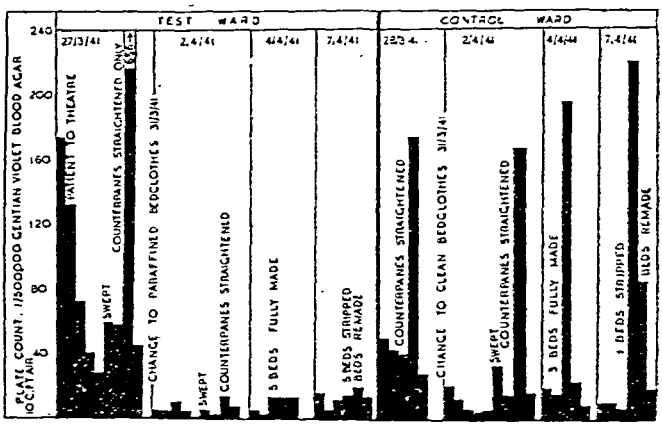


FIG. 5.—Reduction of aerial organisms by treatment of bedclothing.

in sweeping them thoroughly and because dilution of infected dust is less than in a ward. The dust of one cubicle, swept up in the morning, contained over 20 million streptococci per gramme, and the dust collected the same evening 5 millions per gramme. It is significant that these dust samples, when retested after a fortnight on the bench, showed very little reduction in the number of viable streptococci present, counts of 13 to 14 millions per gramme still

being obtained. Smaller numbers of streptococci were usually obtained in dust swept up from linoleum floors than in that from wooden floors, probably because the former can be swept more efficiently.

In one cubicle experiment the total number of organisms in 10 c.ft. of air rose from 15 to 1,528 as a result simply of straightening the counterpane and blankets of a single bed. Having regard to the reduction factor of our gentian-violet medium, this is equivalent to a dispersal of 2,500 organisms per cubic foot of air.

Ordinary bedclothes therefore represent such a powerful and persistent reservoir of infection that there is real danger of cross-infection from this source.

Reduction of Dust-borne Organisms in Air by Liquid Paraffin Treatment of Bedclothes

The experiments with paraffined bedclothing fall into three main groups: (a) experiments in which a whole ward was placed in treated bedding and another in clean bedding as a control; (b) experiments in cubicles in which a patient known to be emitting streptococci was transferred to paraffined bedding after a control period in ordinary bedding; and (c) the reverse experiment—changing such a patient into ordinary bedding after a control period in paraffined clothing. Ideally it is desirable to combine (b) and (c) with one patient, but this is rarely practicable: the patients soon cease to produce large numbers of organisms with adequate treatment, and an acute infective period of ten to fourteen days would be necessary for such an experiment.

(a) Ward Experiments

The ward experiments were made during a non-epidemic period, with most of the patients fully convalescent. The numbers of streptococci recovered were therefore small, and for the most part we have relied upon total counts as an index. In a preliminary control period we established that in both test and control wards there was a large increase in the number of organisms in the air with disturbance of bedclothes, even when this entailed only the straightening of counterpanes. At the end of this control period the beds in the test ward were supplied with paraffined bedding, while those in the control ward were given clean but untreated bedclothes. The men in the test ward were not told that their bedding was oiled, and at the time of the change were so used to the air-sampling machines running that they noticed nothing unusual.

Counts were made for periods up to eleven days. Some of the treated bedding was used continuously for more than a month, and when tested in cubicles had lost nothing of its efficiency. The increase in the bacterial content of the air associated with bed-making rapidly reappeared in the control ward, and, as was to be expected, became gradually greater. In the experiments shown diagrammatically in Fig. 5 the mean count during bed-making in the control ward was 194 organisms per plate. During the same period the test ward showed a mean count of less than 15, in spite of the fact that on each occasion five beds were made in the test ward as compared with three in the control ward. The use of paraffined bedclothing therefore reduced the number of organisms liberated during bed-making by 93% even in a large ward of sixteen beds.

(b) and (c) Cubicle Experiments

The results of one of the most striking experiments are shown in Fig. 6. The occupant of the cubicle developed a severe Type VI streptococcal tonsillitis during the January epidemic, and was transferred to clean bedding in a cubicle on the second day of his illness. The floor of the cubicle was not oiled, and the fact that two days after his transfer plates exposed during bed-making and sweeping grew 141 streptococci may partly be due to this. The floor dust collected that morning was estimated to contain over 13 million streptococci per gramme, and a further 4,900,000 per gramme had accumulated by the evening. From

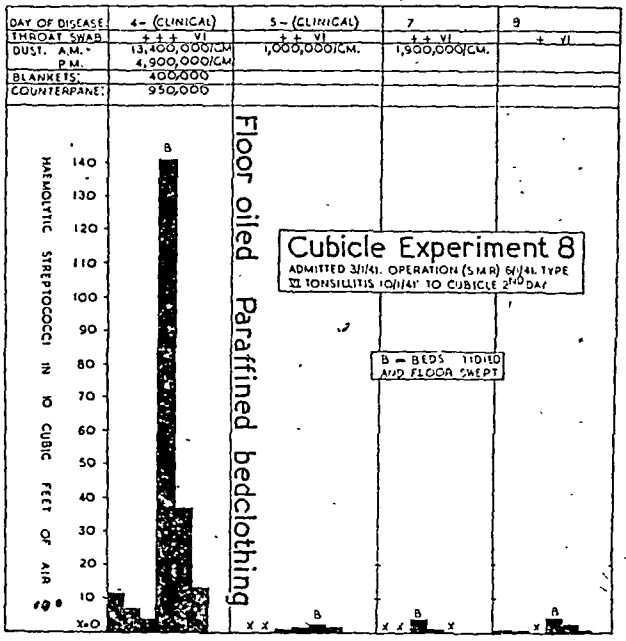


FIG. 6.

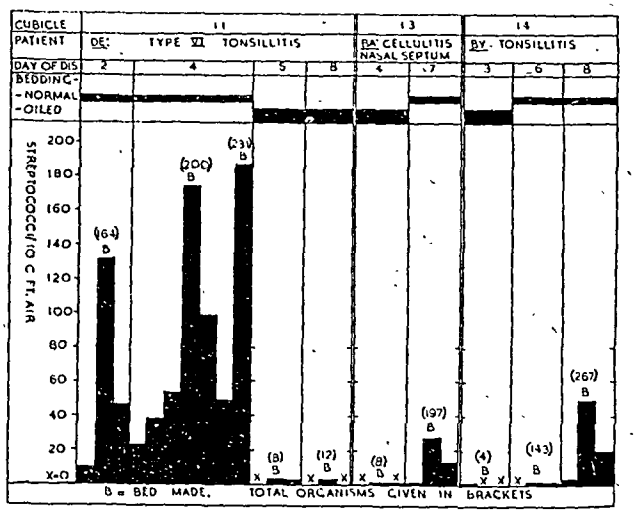


FIG. 7.—Reduction of aerial streptococci by paraffined bedclothing.

samples taken from his bedclothes it was calculated that in this period of forty-eight hours his blankets had collected 400,000 streptococci each, while the counterpane contained nearly a million of these organisms. On that day the floor was oiled and he was changed into paraffined bedclothes. This resulted in a striking fall in the numbers of streptococci projected into the air, the mean count up to the eighth day being less than 4 organisms per plate, in spite of quite vigorous bed-making. That he was emitting streptococci during this period was shown by analyses of floor dust, which contained a million streptococci per gramme on the day after the change and nearly 2 millions per gramme two days later.

A similar, and equally striking, experiment is shown in Fig. 7 (cubicle 11). In this case the floor had been oiled for some months, and at the time of this experiment the

or treatment was still effective. Control experiments up the sixth day of the disease showed that 130 to 180 ptococci could be recoveted from 10 c.ft. of air during d-making, and it is significant that two such peaks a be produced within thirty minutes of each other. A ange to paraffined bedclothing led to an immediate fall th of total organisms and of haemolytic streptococci by re than 95%. Throughout this period the patient had luxuriant growth of streptococci in his throat.

The reversed experiments are equally illuminating (Fig cubicles 13 and 14). Here two men, one with a ere cellulitis of the nasal septum and the other with acute follicular tonsillitis, were placed direct in paraffined dclothing for four and three days respectively. This iod is sufficient to allow large numbers of streptococci accumulate on the bedclothes. At the end of this period was only by hard shaking of the bedclothes that we re able to grow a single streptococcus from the air. ese patients were then changed to ordinary bedclothes, ich immediately began to liberate considerable numbers streptococci whenever the beds were made.

The experiments have shown, therefore, that the treatnt of bedclothes with a dust-laying oil greatly reduces e number of organisms which can be liberated from them. e think it significant that its use, in the same degree the use of spindle oil on floors, has never yet failed to lace the swarms of bacteria, both pathogens and saprotes, which are showered into the air whenever a bed made or a blanket moved.

Discussion

That dust may be responsible for cross-infections has en known for many years (Flügge, 1897; Neisser, 1898; instein, 1902), but the importance of these earlier observans seems to have been neglected in succeeding decades. terest in the infectivity of dust has more recently been vived, and cases have been reported in which cross-fection has undoubtedly been due to dust. The presence streptococci in ward dust has been shown by Deicher 937); Allison and Brown (1937); Cruickshank and ober (1939); Glass (1941). The importance of dust the spread of respiratory infections in hospital wards s, however, not received general recognition, and little tempt has been made to guard against the danger of dust-rne infection.

Ward dust comes from two main sources—floors and dclothes—and from these it is distributed into the air sweeping or by bed-making (Cruickshank, 1941; Miles d others, 1940). Dust on the floor is readily made relaely innocuous by treatment with a dust-laying oil, a ct which has long been known, but has not been adopted hospitals until recently. The treatment of floors with dust-laying oil prevents the organisms deposited on them om being distributed into the air. Bacteria are not stroyed by the oil, and the dust swept up must therefe still be treated as infective and disposed of suitably.

Bedclothes constitute an equally if not a more serious urce of aerial contamination. Streptococci accumulate pon the bedclothes of any patient with a streptococcal fection of the upper respiratory tract. Deicher could cover streptococci from the walls and furnishings of scarlet ver wards. Glass has obtained similar results in puerperal ver wards, and in the wards in which our experiments ere performed it was possible to recover streptococci even om the ceilings. Hare (1941) showed that the accumuation of streptococci could occur also in the environment healthy streptococcus carriers. The rate at which streptococci accumulate is of importance. With cases of cute follicular tonsillitis placed in clean bedding we have ten able to demonstrate an accumulation of nearly a illion streptococci in a single blanket in two days.

Although the bedding from such cases is normally disinfected, the same does not hold for every patient who develops a sore throat in hospital. Ward blankets, unless obviously dirty, are only too often used over and over again. The same holds for blankets on theatre trolleys. The risk of spreading infection by this means is only too obvious. Blanket dust is one of the main sources of air-borne streptococci in hospital wards; and may play an important part in air-borne cross-infection. The simple act of making a bed may throw into the air as many as 2,500 organisms per cubic foot, and it is common, in infectious wards, for blankets to contain anything from a half to one million streptococci each. We have shown that on occasion as many as 70,000 streptococci may be freely suspended in still ward air, and that even in a large ward, where considerable dilution must occur, this number is doubled or trebled when a bed is made. In smaller wards the rise is proportionately greater, and a tenfold increase is not uncommon. Cruickshank found 200 streptococci deposited upon a pair of Petri dishes in an hour during bed-making and toilet. This would correspond to a recovery of 2,500 streptococci by a slit-machine or 40 per cubic foot of air. These counts are of the same order as we observed in our single-bed cubicle experiment. A patient in such a cubicle may therefore be inhaling between 500 and 1,000 streptococci an hour, of which 90% would have been retained within the respiratory tract (Lehmann, Saito, and Gfrörer, 1911). We do not know what number of organisms constitute an infective dose, but there can be no doubt that in a ward in which no precautions are taken against dust the risk of respiratory infection is very great.

These experiments have shown, further, that during bed-making the number of organisms liberated from bedclothes is reduced by 90 to 95% by treating them with liquid paraffin. This reduction, which occurs both in large wards and in small isolation cubicles, is of the same order as that found by van den Ende, Edward, and Lush in their laboratory experiments. As in the dust of oiled floors, the organisms on oiled blankets, although prevented from being distributed into the air, are still viable and potentially pathogenic.

The application of liquid paraffin from a solution in white spirit requires specially designed hydro-extractors, with an automatic return of the liquor direct to the soaking-tanks, which are not available in hospital laundries. Moreover, the use of white spirit as a solvent involves special fire precautions. In these experiments we were concerned, however, only with establishing the efficacy of the principle involving the application of dust-laying oils on bedclothes. Experiments with simple oil-water emulsions applied in the form of a spray, and with oils other than pure medicinal paraffin, are at present in progress.

Dust-laying methods can, of course, only be expected to be effective against the spread of infection when the patients are confined to bed. They cannot prevent direct infection among ambulant patients, with whom droplet infection probably plays the major part, or in cases in which infection is spread by other means than through the air. It seems essential, therefore, that all hospital patients exhibiting β-haemolytic streptococci in their throats should be confined to bed. If this is done the combination of the method of laying dust on bedclothes with the use of spindle oil on ward floors will greatly assist in reducing the incidence of ward infections. It will probably find special application in scarlet fever, diphtheria, and ear, nose, and throat wards.

Other sources of dust, though probably less important, should not be neglected. Thus damp dusting or dusting with oil-impregnated dusters is essential, and the possibility that streptococci may be carried upon the clothing of doctors, nurses, and ward orderlies must be considered.

These points require further investigation, and it is now necessary to undertake experiments on a large scale, to determine whether a continuance of all available methods of dust-laying will result in a significant reduction of the incidence of cross-infections in hospital wards.

Summary

Attention is drawn to the very large numbers of streptococci which may accumulate in the dust and in the bedclothes of hospital wards.

It is shown that many of these organisms are projected into the air every time a bed is made or in any way disturbed, and it is suggested that these represent a very real danger.

The treatment of bedclothes with liquid paraffin, while not visibly affecting them, causes a 95% reduction in the number of organisms distributed into the air during bed-making.

It is suggested that this method of dust-laying, combined with the use of spindle oil on floors, may assist in reducing the incidence of cross-infections in hospital wards..

We are indebted to Major-Gen. H. Marrian Perry, C.B., O.B.E., F.R.C.P., Director of Pathology, Army Medical Services, for allowing one of us to carry out his part of this work in a military laboratory; to Colonel E. B. Marsh, *M.C.*, R.A.M.C., for placing so many facilities at our disposal; to Dr. C. H. Andrewes, F.R.S., and Dr. R. B. Bourdillon for much helpful advice; to Dr. Otho Fitzgerald, medical superintendent of the hospital, for the use of the hospital laundry; to the medical officers and nursing staff who have co-operated so readily with us; and to our assistants, Sergt. H. G. Stevens, R.A.M.C., and Cpl. T. Bury, R.A.M.C., for their continued help in the laboratory.

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It was recently announced by the Board of Trade that arrangements had been completed for the manufacture of an adequate supply of high-tension batteries to meet the needs of deaf persons who use hearing aids. A standard range of batteries to be manufactured in wartime has been drawn up and embodied in a specification to be issued by the British Standards Institution (B.S. 966) High-tension batteries for hearing aids must be as small in size and as light in weight as possible, and in peacetime these requirements were met by making up the batteries from very small unit cells. At the present time there are heavy demands for these midget cells for batteries for other purposes, and it has become necessary to standardize a range of batteries for hearing aids made up from cells which, so far as can be seen at present, will be available in sufficient quantity to enable hearing aids to continue to be serviced with the minimum of inconvenience to all concerned. There are eleven batteries in the standard range, and these should prove adequate to cover the requirements of all existing makes of hearing aids which employ H.T. batteries, though it may be found that some instruments will need minor modification in order to accommodate them. Such modification applies to the battery casing only, and no modification to the mechanism of any instrument is called for. Copies of this new specification will be available shortly from the British Standards Institution, 28, Victoria Street, S.W.1, price 2s. 3d. post free.

RECENT EXPERIENCES IN THE TREATMENT OF GONORRHOEA IN THE MALE*

BY

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In military practice the incidence of venereal disease is surprisingly low, and in this I have no doubt that we are reaping the benefit not only of the far-sighted policy of the Ministry of Health, but also of the standard of work which medical officers in charge of clinics have maintained during the past twenty years. The Medical Services of the Army also deserve much credit. For many years the officers of the Royal Army Medical Corps have insisted on educating the troops for whose health they are responsible on the dangers of promiscuous intercourse; as is widely known, their preventive work in the venereal field has reached a very high standard. In the active treatment of venereal diseases their standards have been equally high, and the population at large owes a debt to the Army Medical Services which, while unrecognized by the majority—venereal disease not being a subject for public discussion—is nevertheless very real. Despite the disturbances of war the Medical Services have taken steps to ensure that the prevention of venereal diseases and the treatment of these diseases are in keeping with modern standards.

Experiences in the Use of Sulphapyridine

We have found that the local application of sulphapyridine to chancroidal ulcers is a satisfactory form of treatment.

Some of our experiences in the treatment of gonorrhoea with sulphapyridine may be of interest to the profession. At the outset I wish to emphasize that I here refer to practical work. A war is in progress, and it is our duty to get the men fit and back to their units as soon as possible. For this reason the necessarily slow methods of pure clinical research have not been possible; but our work is controlled by a system of surveillance after the patients leave hospital, and we are able to assess from this, with a great degree of accuracy, whether our belief in the methods of treatment we use is based on mere optimism or on therapeutic achievement. The fact that this surveillance is usually carried out by medical officers in districts remote from ours makes this form of control of our work more satisfactory and perhaps less liable to criticism than otherwise it might be. I will refer to this subject later in the paper.

When, a little over a year ago, I took over my duties as officer in charge of a dermatological division, the cases of gonorrhoea were being treated on routine lines. Sulphapyridine was administered thrice daily, the average dosage being 3 grammes a day. Treatment was given for a week or ten days, during which time the men were kept in bed and on a light diet The results were satisfactory, but not outstandingly so.

As you probably know, in the Army cases of gonorrhoea are treated in hospital and the men are not allowed to carry on with their duties. This confinement to hospital may be irksome to the individual, but from the medical standpoint it is of the greatest benefit both to the patient and to the physician. I soon came to the conclusion that with the

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atients under observation and their diet under control ery much larger doses of sulphapyridine could safely be iven. I therefore instituted an "eight-day course," during hich the men were strictly confined to bed, received only nilk diet, and were encouraged to drink as much barley-ater as they could stomach. The course of treatment as as follows: On the first day they received 6 grammes f sulphapyridine. This dose was repeated on the second lay; on the third and fourth days they were given l grammes daily, and on the remaining days 3 grammes The tablets were given thrice daily, and the course consisted of 32 grammes of sulphapyridine in eight days. omewhat to my surprise there was no difficulty in keeping he men on milk diet for that length of time. As one philosopher sadly remarked: "Those d——n tablets makes ou feel so lousy you doesn't want to eat."

On this course, which was given to several hundred cases, here were no severe complications, but there was too high a proportion of generalized scarlatiniform eruptions associated with a brisk rise of temperature. This complication usually developed between the seventh and the tenth days (usually the ninth) after the course began. It caused the patient some discomfort, but, as the rash and the fever seldom lasted longer than forty-eight hours, it did not give us much anxiety. For the majority of the patients the chief disadvantage of the treatment was that when on the ninth day they had to get up they were weak from the combined effects of the action of the drug and the low diet. Nevertheless the method was successful and relapses were few.

After this routine had been employed for some months I asked Major R. T. Wordingham to concentrate on the treatment of gonorrhoea in my department, and to alter and amend the method as he thought fit. We had the benefit of a consultation with Dr. R. Forgan, who told us that in his opinion it was the initial heavy dose of sulphapyridine which was the essential factor in curing the disease. We kept this opinion in mind, and Wordingham began his investigations.

Requirements in Sulphapyridine Treatment

We agreed that in sulphapyridine treatment there are certain desiderata. These may be tabulated as follows:

1. That the first dose should be the maximum which the average patient would tolerate.

2. That it was a mistake to administer the drug only during the day. The administration should be maintained throughout the whole of the twenty-four hours so as to keep the concentration in the blood as high as possible.

3. That the patients should be kept on milk diet during the course of treatment. We were, and still are, convinced that this is beneficial.

4. That barley-water should always be available in the wards, and that the patients should be encouraged to drink as much of it as possible.

5. That particular care should be taken to avoid constipation. We had noticed that the scarlatiniform eruption due to sulphapyridine was invariably preceded by constipation for forty-eight hours or longer. There is no doubt that failure to defaecate is an important predisposing factor in the development of the complications of sulphapyridine therapy.

Wordingham's first task was to discover the optimum initial dose of the drug and to curtail the length of the course. This necessitated a long series of clinical observations and some biochemical investigations. During these he discovered two things: first, that if the patients are not allowed to smoke, nausea and vomiting—those two bugbears of this form of treatment—are reduced; secondly, that the administration of potassium citrate in large doses (30 grains in a simple mixture, two-hourly) is beneficial. By a process of trial and error Wordingham devised a routine which we have used in many hundreds of cases, and during this time we have had only one death. This case, examined at necropsy by an independent pathologist, was found definitely not to be due to sulphapyridine poisoning. The findings of the pathologist, with notes on the case, were submitted to Lieut.-Colonel T. E. Osmond, R.A.M.C., who agreed that death could not be attributed to the drug.

The course consists in the administration of 22 grammes of sulphapyridine in forty-eight hours. The tablets are crushed and are given in milk every four hours during the day and night. Two important points should be noted—namely, that the tablets are *crushed*, and that there is no interruption of the treatment during the night. The first dose is 5 grammes; the second, 4 grammes; the third, 3 grammes; the fourth, 2 grammes; the remaining eight doses are each of 1 gramme. If a patient begins treatment at noon he will be given 10 crushed tablets (each tablet of sulphapyridine containing 0·5 gramme): at 4 p.m. he receives 8 tablets, and at 8 p.m. 6 tablets. At midnight he is awakened and given 4 tablets, and at 4 a.m. he has 2 tablets. And so the course continues until he has received the total dose of 22 grammes.

The course differs considerably from the routine treatment, devised by Lieut.-Colonel T. E. Osmond, R.A.M.C., which is generally used in the Army. That treatment is as follows: On the first day the patient receives 2 grammes of sulphapyridine as soon as the disease is diagnosed, and thereafter 0.5 gramme every four hours during the day and 2 grammes at bedtime. On the second day he receives a total of 4 grammes of sulphapyridine, and from the third to the seventh day, inclusive, 3 grammes of the drug every day. Irrigation of the urethra with potassium permanganate or oxycyanide of mercury may be used in conjunction with the sulphonamide therapy, at the discretion of the medical officer. This treatment is followed by the usual investigations of the prostate gland, etc.

Lieut.-Colonel Osmond, to whom we are much indebted, gave us the benefit of his opinion both by writing and verbally. Wordingham's intensive course was adopted only after consultation with him and with his concurrence.

During the intensive course of sulphapyridine most of the patients have some degree of frontal headache; about 10% suffer from sickness; and many show a slight degree of cyanosis, but this disappears within twenty-four hours of the termination of the course. The cyanosis is little more than a slight blueness of the lips, and, in some men, a very slight degree of slate-blue discoloration of the face and ears. In this respect Buttle (1939) may be quoted: "Cyanosis seems to be partly due to the elaboration of pigments from condensation of the drug itself, and it is usually thought that it can be neglected from consideration as a symptom of overdose."

Vomiting is a variable factor. If it occurs it usually develops about eighteen hours after starting treatment—that is, about two hours after the taking of the fifth dose. Thereafter the patient may not vomit again, or if he vomits he will do so an hour or two after each administration of the tablets. The wastage by vomiting is therefore not great. At the present time we are having a series of biochemical investigations carried out to determine the average loss of the drug in those patients who vomit. So far as our investigation has gone the actual loss appears to be very small; this confirms the clinical findings, for we have not experienced any marked delay in response to treatment in those cases in which vomiting has occurred. Vomiting is, of course, influenced by psychological factors. If two or three men in a ward vomit, the majority of their companions will follow their example. If before the course begins they are warned that they may be sick, they usually are sick.

Complications of Sulphapyridine Therapy

Headache, lassitude, nausea, and vomiting are the only complications which we anticipate. We have not seen a case of agranulocytosis or of haemolytic anaemia.

There are, however, two complications which are seen and which must be remembered. In a few cases during the course of treatment, and usually early in the second day, the patient may complain of pain in the lumbo-costal area, extending thence to the epigastric region. Usually it is felt on only one side of the body, but it may be bilateral. The pain is severe and the patient may be restless. There is marked tenderness on deep palpation of the upper lumbar area, and there may be tenderness on pressure over the ureter. Occasionally before the pain develops, but as a rule shortly after, the patient's urine becomes blood-stained, and a brisk haematuria may occur. In severe cases there is usually a visible precipitate of crystals if the urine is allowed to stand in a conical urine glass. When these symptoms develop there is a diminution in the amount of urine passed, with nitrogen retention. Vomiting usually occurs, and may be severe. We regard the condition as a pyelonephritis caused by the formation of a compound known as acetyl-sulphapyridine. The crystals of this compound take the form of sharp needles, and we presume that the haematuria is produced in a manner analogous to the bleeding in oxaluria.

In most cases there are no further signs or symptoms, but in a few instances anuria occurs, and may persist for as long as thirty-six to forty hours. During this time no grave symptoms have developed in the cases we have had, but, needless to say, the condition is one which we have viewed with some anxiety.

The treatment given has been simple but successful. The administration of sulphapyridine is stopped; the pain is relieved by 1/3 grain of morphine; barley-water is given in large amounts; and the administration of potassium citrate is continued. If vomiting is troublesome rectal salines are given so that the maximum fluid intake is obtained. Constipation is treated by cascara and, if necessary, by enemata. Here I should like again to emphasize the importance of avoiding constipation during sulphapyridine therapy: in almost all these cases the bowels have not been open for two or three days before the appearance of the symptoms. The pain and haematuria usually disappear within forty-eight to sixty hours of their onset, and as a rule the gonorrhoea is cured. I have not had an opportunity to work out the exact incidence of this complication, but it does not occur in more than 1 in 600 cases.

It may be asked what permanent effects accrue as a result of these events. Needless to say we have watched with particular interest the men who have suffered in this way. In no case have any signs of permanent renal damage been found. Ten days after the haematuria has disappeared the urine has been clear: there has been no albuminuria, and casts and red blood cells have not been demonstrated in centrifugal specimens. Also the blood urea has been normal, and urea-concentration tests have given no evidence of impaired renal function. These tests, repeated after an interval of three or four months, have produced similar satisfactory results.

Recently doubt has been cast on the belief that saline purgatives should not be given during the administration of sulphonamide compounds. Forgan (1939) has said that "it might be proved that there was no advantage, possibly even a disadvantage, in eliminating foods with a high sulphur content from the diet of patients receiving moderate doses of sulphapyridine (M & B 693)." With regard to these two points we have known cases in which, despite instructions to the contrary, some patients have taken magnesium sulphate in fairly large doses whilst receiving sulphapyridine, and others have had eggs and onions while taking sulphanilamide. In no case have we noted any ill effects from these departures from the customary regime.

I have described in some detail Wordingham's course of sulphapyridine therapy because I am convinced that, provided the patient has an average tolerance to the drug, the ideal line is to attack with a maximum dose and to give a short course of treatment. This method succeeds where other methods fail, as in the case (referred to at page 982 of this issue) of the young officer suffering from chronic meningococcal septicaemia, who was not cured by small doses of sulphapyridine, but who rapidly responded to the short intensive course. Quite rightly it may be said that in the Army we are dealing with young men chosen after a medical examination, and we cannot presume that this method of treatment would be so successful if applied to the community at large. We appreciate this, but we have noted that older men in the fourth decade have usually tolerated the course well. Social distinctions sometimes make a difference in therapeutics, and particularly in gonorrhoea, from which the average hospital patient seems often to make better recovery than the private patient; but we have had no complications or difficulties arising in those officers whom we have treated.

There is one obvious precaution on which we do insist: we consider it inadvisable to administer the treatment to patients who have a history suggesting that they may have suffered from gastric or duodenal ulcer, for in these cases there is a risk that severe vomiting may develop and haematemesis may ensue.

The Routine followed by Gonorrhoea Treatment

It must not be imagined that the treatment of gonorrhoea in my department is confined to the administration of sulphapyridine. The full routine is as follows:

As soon as possible after the diagnosis has been confirmed by microscopical examination of the urethral discharge the patient is put to bed. If he is considered to be a suitable subject for intensive therapy he is given a milk diet, and mist. potassii citratis and barley-water as already indicated. He receives 22 grammes of sulphapyridine in forty-eight hours. On the third day he gets up. He is usually a little weak and lethargic, but is quite fit to take his meals in the dining-room and to go to the irrigation room for treatment. Usually his urethral discharge has almost ceased, but there may be a slight muco-purulent urethritis. On microscopical examination of this discharge pus cells and epithelial cells may be found, but gonococci can seldom be demonstrated. He is then kept for two or three days on irrigations of potassium permanganate 1 in 8,000, or oxycyanide of mercury of the same strength. Treatment is given thrice daily and the "grand lavage" is used, the irrigating fluid being allowed to flow into the bladder. On the sixth day the patient, who has not urinated for at least eight hours, reports at 6.30 a.m. for a "morning urethral smear." Very often a smear is not obtainable. If there is any moisture in the meatus it is usually found on microscopical examination to consist of mucoid secretions, probably prostatic in origin, with a few epithelial cells and spermatozoa. Later in the day a two-glass urine test is made, and if this is satisfactory a prostatic smear is taken. Usually no evidence of prostatic infection is found.

If these tests are favourable the patient takes two bottles of stout with his evening meal, for alcohol is a good test of cure. The "morning smear" and the urine examination are repeated on the seventh day, and if these are satisfactory a provocative dose of gonococcal vaccine containing three hundred million gonococci is given. On the eighth day the patient reports for yet another "morning smear"; a prostatic smear is taken and the usual urine test is made. If these tests are all satisfactory the anterior urethra is examined through a urethroscope. At this stage we expect to find a diffuse reddening of the urethra, but no littritis—no inflamed follicles. A curved sound of suit-

able size is passed. If possible we keep the patient under observation for a further two days, as occasionally there is a delayed reaction to the vaccine.

You will note the frequency with which the "morning smear" is investigated, and the fact that every patient has at least two prostatic examinations. This is because we are well aware that one of the dangers of sulphapyridine therapy is that in some cases pus formation, the cardinal sign of gonorrhoea, is decreased, while gonococci may occasionally be present in the urethra or in the prostatic secretion.

When our tests of cure and the period of observation are finished the patient returns to duty, but observation on the case does not end. Three weeks later the man reports to a military hospital, where he is examined by a medical officer who has had a training in the treatment of venereal disease. He is examined for signs of urethral discharge; the two-glass urine test is made, a prostatic smear is taken, and usually a curved sound is passed. The same investigation is repeated during the following two weeks. Although all the tests may be negative (and if they are not he is immediately referred back to us for treatment) he is not yet passed as cured. Three months after his discharge from hospital he is sent either to us or to some other centre. Another provocative injection of gonococcal vaccine is given, and all the usual tests—macroscopic, microscopical, and urethroscopic—are carried out. Only if these are negative is he discharged as cured. During the period of surveillance Wassermann tests are carried out to ensure that a concomitant infection with syphilis has not been missed.

I think, therefore, that we can claim that our work, though purely clinical, is well controlled: this being so, it is satisfactory to find that the relapse rate is under 5%

Summary

The incidence of venereal disease is discussed, together with the part played by the Medical Services of the Army in prevention.

An intensive method of treating gonorrhoea is described at some length.

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ACUTE GONORRHOEA

FURTHER OBSERVATIONS ON TREATMENT BY SULPHAPYRIDINE FOLLOWED BY LAVAGE

BY

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In my original article (Sommerville, 1939) I reviewed 152 consecutive cases of acute gonorrhoea treated with sulphapyridine alone, without adjuvant therapy, in 90% of which early cures without complications were obtained. By comparison Dr. J. G. McGregor-Robertson (1938), using the drug in connection with lavage, claimed 100% early cures, but with 3% complications.

Technique

In a final note to that article I stated that I had altered my technique. This alteration was made in an attempt to maintain the freedom from complications and at the same time to improve the percentage of early cures. The present article is a review of 300 consecutive cases treated according to the new technique, which is as follows.

Sulphapyridine is given, the dosage being 0.5 gramme (one tablet) four times a day for one week. Irrespective of the clinical results at the end of this period, irrigation with 1 in 8000 potassium permanganate daily is instituted for a week, followed by similar lavage on alternate days for another week. In most cases this completes the treatment, but if the clinical and urinary examinations are not entirely satisfactory at the end of three weeks lavage is persisted with until the desired result is obtained. Thereafter observation for three weeks is maintained, and a prostatic smear is then taken: if this is satisfactory (less than four pus cells per field) urethroscopic examination, followed by the passing of a curved bougie, is carried out a week later. If there is no response to instrumentation a routine Kahn test is done the following week; and finally all being well, the patient is discharged at the end of nine weeks.

It is now fairly well established that if sulphapyridine is going to act satisfactorily, as it does in 90% of cases, it will do so in approximately three days. If a urethral discharge of any type exists after a week I believe that the virulence of the gonococcus is so diminished that any danger of complication arising as a result of irrigation is at a minimum

Survey of Results in 300 Cases

The results obtained from the present series serve to prove my contention that large doses of the drug are not necessary, and that practically 100% of early cures can be obtained with almost the same percentage of freedom from complications. This article is published not simply because I think the results are satisfactory but more especially as a plea for economy in the use of the drug and with all due deference to those who believe in and employ massive or intensive dosage

In going over the case records I find that my original enthusiasm in investigating the time interval required for urethral smears to become gonococcus-negative has waned considerably, and such observations were noted in 103 cases only. The average time interval in these was 1.74 days, compared with 1.92 days in my original series.

For the purpose of "dry" observations 9 cases are excluded from the record of figure averages. Of these 9 patients 7 were irregular attenders and, later, defaulters with no dry observations of any value owing to the time intervals in their attendance, 1 (a chronic persistent alcoholic who defaulted after nineteen days) failed to clear up or even improve, and 1 (one of two cases which showed repeated relapse, and the subject hereafter of a special note) relapsed before a completely dry observation could be obtained. I have divided the remaining 291 into four groups, as shown in Table I.

TABLE I

Type	No. of Cases	Urethra Dry-Day Average
Average case	250	4.98
Avowed alcoholics	33	23.09
Admitted re-exposures	5	25.60
Complications before therapy	3	30.00
Total	291	7.66

This division has been made because there is such a marked discrepancy between the figures of the normal average case and the other three groups. Especially interesting is the alcoholic group. The intake of alcohol quite evidently makes a considerable difference in the prognosis of a case, as the figures prove. It is also scarcely fair to slump all the cases together and thus alter materially the statistics obtained. The results obtained in the present series conform very closely to those of my previous one. Thus from the figures already given it can be seen that out of 293 cases 2 (0.68%) may be recorded as failures.

I have once more investigated the question of intolerance, so as to arrive at a more or less accurate estimate of any toxic upset with the moderate dosage employed. Of the 300 cases 39 (13%) gave some sign of intolerance, 9 of them having two symptoms. Table II shows the incidence of each upset.

TABLE II

Kind of Upset	No.	Average Day Incidence
Nausea	14	2.85
Temperature	1	3 (? influenza)
Headache	14	3.85
Indigestion	5	4
Vomiting	7	4
Cyanosis	2	5
Vertigo	4	6
Rash	1	7

Table III shows the incidence of complications noted before and after starting treatment: 10 (3.33%) were recorded before and 5 (1.66%) after therapy began.

TABLE III.—*Complications*

Type of Complication	Before Treatment	After Treatment	Explanation of Complications Noted After Treatment
Prostatitis	6	2	1: alcohol ++ 1: wife G.C. + 1: prostatitis before 1: re-exposed
Epididymitis	3	2	
Prostatitis + epididymitis	1	—	
Periurethral infiltration	—	1	
Total	10	5	

Relapse was noted in 20 (6.66%) of the cases reviewed, no history of re-exposure or fresh infection being admitted. Alcoholism accounted for 15, and this was denied in the remaining 5. Of these 5 patients 2, including the case already mentioned, gave a history of repeated relapse, and constantly denied sexual excitement, re-exposure, or alcoholism. The remaining 3 cases gave no history of alcoholism either before or after the onset of the disease, and are therefore more likely to be examples of genuine failure to respond to the drug. They subsequently cleared up, however, with additional treatment. Of all the cases of relapse 10 subsequently cleared up completely and were discharged well, 9 defaulted, and 1 was transferred to another centre.

I am afraid that I very gravely doubt the veracity of the statements of many patients attending at V.D. centres. I have often been given a denial as regards intake of alcohol, which was later corrected after a lapse of time, when the patient had forgotten what he had told me. *Omnis syphiliticus mendax est* is as true to-day as it ever was, and every dodge and trick must be employed to elicit the truth. The failure of all my wiles to break down repeated denials of alcohol or re-exposure, and the protestations, with every appearance of injured innocence, in two cases of repeated relapse worried me not a little.

These two cases proved so troublesome—and ultimately interesting—that they merit a note by themselves. In both cases, to begin with, alcoholism was admitted at the first examination, but thereafter alcohol, re-exposure, and sexual excitement were consistently denied. No sign of any complication could be found in spite of full and persevering clinical examination for any residual focus. Even before they were ultimately and finally dismissed as cured an appeal to "honour in the cause of science," an appeal which I have often found effective in getting the truth, failed completely, so that I was left with an uneasy and unhappy feeling about the mystery of it all. Both cases had had chemotherapy and lavage, repeated at intervals, and also vaccine therapy. The result was always the same—a quick response to treatment, complete freedom from symptoms for two to three weeks, and then a breakdown to "purulent" again.

While going over the records and preparing my figures I was struck by the comparative regularity of those repeated relapses; so with the aid of a calendar I checked up on the day of the week that each clinical note of "purulent" was made. To my astonishment, and I must admit relief, the incidence of relapse fell on a Monday, except for a few occasions when it fell on a Thursday—that is, forty-eight hours after a Saturday or Tuesday holiday. My own conclusion, although another interpretation may be possible, is that both men had succumbed to temptation and had lied consistently. I presume that the repeated questioning, with the obvious suspicion that I simply did not believe them, and ultimately an increasingly poor prognosis being hinted at, must have scared them sufficiently off alcohol to enable a cure to be finally obtained. Table IV shows the incidence of relapse, the above 2 cases being excluded.

TABLE IV

	No.	Time of Relapse in Days					
		1-7	14	21	28	35	56
Alcohol	15	2	3	2	3	4	1
No apparent cause	3	-	1	1	1	-	-
Total	18	2	4	3	4	4	1

Conclusions

These follow-up investigations confirm the efficacy of sulphapyridine as a cure for gonorrhoea. Moderate dosage—namely, 0.5 gramme four times a day—has continued to give excellent results, and intolerance with this dosage is not pronounced. The use of subsequent irrigation has increased the early cures to practically 100%, with almost the same percentage of absence of complications.

Summary

Review is made of 300 consecutive cases of acute gonorrhoea treated with sulphapyridine, 0.5 gramme four times daily for one week, followed by two weeks' lavage.

Only 2 (0.68%) patients failed to show the usual early clinical cure: one an avowed alcoholic and defaulter; the other, with a subsequent history of repeated relapses, almost certainly an alcoholic.

The course of the disease in alcoholics, in those re-exposed, and in those presenting complications before treatment is contrasted with the average normal case.

Toxic symptoms were noted in 13% of cases, none of them serious.

Complications arising after treatment was begun occurred in 5 (1.66%) cases, but in 4 of them an exciting cause is demonstrable. In only 1 (0.33%) case can the drug be said to have failed to prevent a complication.

Relapse occurred in 20 (6.66%) cases, alcoholism being admitted in 15 and being present almost certainly in 2 others. In 3 (1%) cases relapse occurred for no apparent reason.

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Dr. F. M. Turnbull (*J. Amer. med. Ass.*, 1941, 116, 1809) treated cases of chronic sinusitis by spraying the nasal passages with a 5% solution of the sodium salt of sulphathiazole. He states that considerable relief was attained in 40 out of 47 patients. He observes that cultures taken from the sinus have shown that the predominating organism is the staphylococcus.

SURGICAL TREATMENT OF CONGENITAL PYLORIC STENOSIS

BY

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The uncertainties of the time in which we live, the possibility that all records may be destroyed, have prompted me to publish the figures and tables reproduced below. They appear to me to be of value in that they demonstrate the striking difference in the mortality of pyloric stenosis in breast-fed and bottle fed infants. This fact has been recognized, but herewith it is very clearly demonstrated.

Table I is a list of 100 breast fed babies operated on at the Infants Hospital, Westminster. It is a consecutive list of the breast-fed infants either referred to me by my medical colleagues or admitted under my charge during the period reviewed. No child was ever refused operation, as no child suffering from this disease is ever too ill for operation. There were no deaths. All the children were discharged from hospital well. There were 13 girls and 87 boys. Four children did not have their birth weight recorded. Of the remaining 96, 48 were below birth weight when operated upon.

Table I shows that the earlier patients were kept in hospital longer than the later ones. The length of stay is a matter of grave import in treating sick babies, but it does not appear to be such a decisive factor in breast-fed children, provided that mother and child are both resident in the hospital. In the earlier part of the list—1 to 50—many of the patients were kept for days before operation. Latterly, the length of stay in hospital has tended to decrease. Most of the patients were admitted under the charge of a physician, and the duration of the period of premedication varied with the practice of the particular physician under whose care the child was placed. Patients admitted direct to my beds have been treated as emergencies, and have been operated on immediately, without any preliminary treatment other than a gastric lavage. One has been agreeably surprised at the good progress these children have made (Charts I, II and III).

The result in this series of breast-fed infants is 100% cure. Moreover, the cure is speedy, safe, and certain. The outlook seems to be even more helpful than that of most surgical operations, since the anaesthetic risk has been not only eliminated. The same story, however, does not hold good for the bottle-fed infants. In 1938 23 children were operated on and 2 were lost.

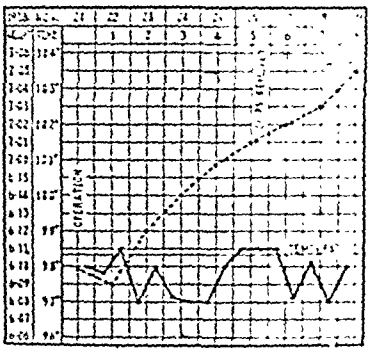


CHART I

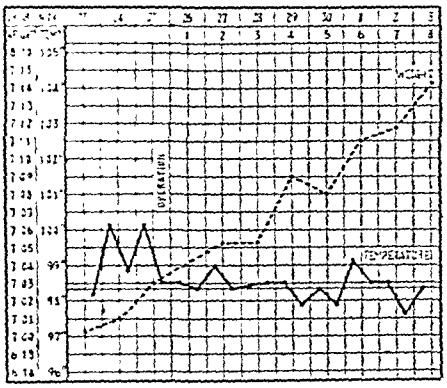


CHART III

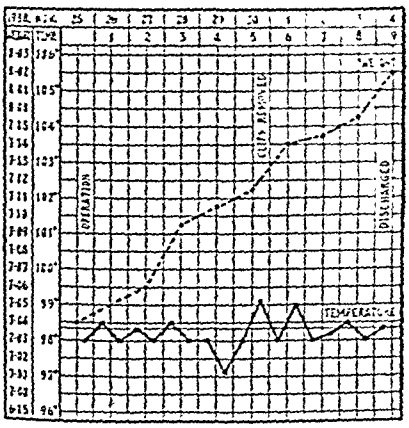


CHART II

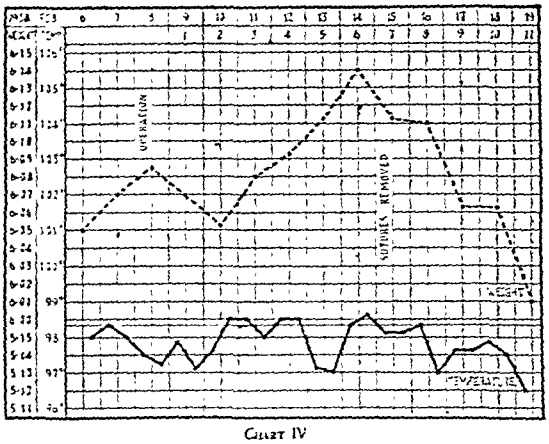


CHART IV

There were certain features in common in the histories of the 5 children who died. The first child "refused the breast from birth," and was artificially fed; the second child was breast-fed for five days only; the third was artificially fed; the fourth was breast-fed for three weeks; and the fifth was not breast-fed at all. The fourth child gives what might be called a "classical history of mismanagement." The child, an only and much-wanted child, was breast-fed until it was three week old. Difficulties were then encountered as the breast milk was said to disagree with it. It was then fed on cow's milk and water. This was followed by a dried milk, and this in turn by another brand of dried milk. Then a condensed milk was used, and finally a further brand of dried milk.

TABLE I.—100 *Consecutive Breast-fed Infants Suffering from Pyloric Stenosis*

No.	Age in Weeks	Sex	Birth Weight	Weight before Operation	Weight on Discharge	No. of Days in Hospital	No. of Days after Operation before Discharge	Gain in Weight
			lb. oz.	lb. oz.	lb. oz.			lb. oz.
1	4	M	9 7½	7 14	9 0	16	12	1 2
2	8½	F	6 0	5 13	6 3	27	15	6
3	6	M	7 4	7 9	8 2	15		9
4	4	F	7 0	6 6	7 1	24	12	11
5	5	M	9 0	8 1	8 12	23	12	11
6	4	F	7 0	5 5	5 6	12	10	1
7	7	M	7 15	7 8	7 8	36	15	
8	10	M	7 13	8 10	8 14	14	9	4
9	8	M	10 0	9 0	9 0	22	10	
10	8	M	8 1	n.k.	10 3	15		
11	4	M	7 3	7 7	n.k.	18		
12	4	M	n.k.	7 0	8 3	14		1 3
13	5	M	7 6	6 10	7 3	18	11	9
14		M	8 3½	7 7½	8 0	9	8	8½
15	4	M	6 12	6 0	6 9	30	18	9
16	4	M	9 8	8 0	8 12	14	10	12
17	8	M	7 0	8 8	8 7	23	8	
18	6	M	8 0	9 2	9 13	12	10	11
19	5	M	7 8	6 3	7 5	18	16	1 2
20	3	F	6 4	5 15	6 11	11	8	12
21	8	F	7 0	8 1	7 15	16	9	
22	3	M	8 8	7 15	9 5	23	2	1 6
23	6	M	9 6	7 8	7 15	9	6	7
24	6	F	9 2	7 11	8 3	9	7	8
25	4	M	5 4	5 12	6 2	16	11	6
26	2	F	7 8	6 2	6 6	12	10	4
27	3	M	7 0	5 13	6 13	10	10	1 0
28	5	M	6 7	7 5	8 2	14	12	13
29	7	F	8 6	9 7	9 14	16	10	7
30	9	M	6 10	8 15	8 15	12	8	
31	6	M	8 4	7 2	7 9	8	6	7
32	7	M	n.k.	8 3	8 10	6	5	7
33	7	M	9 8	9 0	9 4	7	6	4
34	4	M	6 12	7 5	7 11	11	8	6
35	5	M	7 8	8 4	8 11	5	4	7
36	7	M	8 13	9 0	9 7	13	8	7
37	3	M	6 11	6 4	6 12	8	5	8
38	8	M	9 8	8 14	9 1	9	7	3
39	8	M	6 0	6 3	7 0	14	12	13
40	4	M	5 8	6 4	6 9	10	7	5
41	4	M	8 0	6 13	7 9	10	8	12
42	7	M	7 2	8 12	9 0	10	8	4
43	3	M	7 8	7 5	8 1	13	8	12
44	4	F	n.k.	6 8	7 6	21	19	14
45	4	M	8 6	9 3	9 14	9	8	11
46	6	M	8 5	8 4	8 7	6	4	3
47	3	M	6 4	5 8	6 3	25	10	11
48	6	M	7 0	3 9	6 2	12	9	9
49	3½	M	6 6	5 14	6 13	10	8	15
50	3	M	7 10	6 11	7 4	7	5	9
51	6	M	n.k.	8 9	8 14	9	9	5
52	5	F	6 8	6 6	6 14	15	12	8
53	3	M	10 2	8 3	9 6	18	16	1 3
54	4	M	7 4	6 8	6 15	15	14	7
55	6	M	8 6	6 3	6 15	9	8	12
56	9	M	6 1	7 14	8 1	9	8	3
57	5	M	6 13	8 7	8 13	9	8	6
58	4	M	7 0	8 2	8 7	5	5	5
59	6	F	6 0	7 0	7 2	13	9	2
60	5	M	8 0	9 2	9 13	11	10	11
61	6	M	8 0	8 12	9 2	11	10	6
62	4	M	8 11	8 1	8 8	15	11	7
63	4	M	8 2	6 15	7 2	14	10	3
64	3	M	8 4	7 8	8 5	9	8	13
65	3	M	7 12	6 11	7 11	20	20	1 0
66	3	M	10 9	8 11	9 1	8	7	6
67	2	M	n.k.	6 14	7 1	8	7	3
68	8	M	8 5	7 8	7 12	8	6	4
69	6	M	7 4	7 0	7 4	12	9	4
70	4	M	7 4	5 6	6 10	12	11	1 4
71	4	M	7 4	7 9	7 13	9	7	4
72	4	F	8 0	8 2	8 13	9	8	11
73	7	M	8 4	10 4	10 6	7	6	2
74	5	M	7 15	8 0	8 6	8	6	6
75	4	M	7 8	6 8	6 14	8	7	6
76	4	M	7 8	6 6	6 10	10	8	4
77	3	M	6 0	5 2	5 7	13	11	5
78	4	M	7 7	7 11	8 3	9	8	8
79	4	M	6 0	6 9	6 15	10	7	6
80	8	M	10 0	8 2	8 12	8	7	10
81	5	M	6 5	6 8	7 1	8	7	9
82	4	M	6 11	5 12	6 9	11	11	13
83	3	M	7 12	6 1	6 3	12	9	2
84	4	M	n.k.	5 12	6 4	11	11	8
85	8	M	8 0	7 15	8 9	11	7	10
86	4	F	8 0	6 14	7 6	5	5	8
87	6	M	6 12	5 6	6 0	12	9	10
88	4	M	7 8	7 7	7 11	8	7	4
89	2	M	7 0	6 6	6 14	14	10	8
90	5	M	6 12	7 5	7 11	8	8	6
91	6	M	8 2	8 2	8 15	9	10	13
92	5	M	7 0	6 9	7 2	9	8	9
93	8	M	8 7	9 9	9 11	10	7	3
94	4	M	6 7	6 8	7 4	8	8	11
95	5	M	7 12	7 3	8 1	9	8	14
96	5	M	7 5	7 3	7 14	10	8	11
97	3	M	7 5	6 1	6 5	7	5	4
98	2	M	7 6	6 13	7 12	21	9	5
99	5	M	9 6	7 8	8 5	7	6	13
100	5	M	8 2	7 12	8 0	7	5	4

n.k. = Not known.

TABLE II.—*List of Bottle-fed Babies in* 1937

No.	Age in Weeks	Sex	Birth Weight	Weight before Operation	Weight on Discharge	No. of Days in Hospital (total)	No. of Days after Operation before Discharge	Gain in Weight
			lb. oz.	lb. oz.	lb. oz.			lb. oz.
1	6	M	7 0	6 6	6 6	8		
2	10	M	7 8	7 0	Died 10 days after operation			
3	4	M	5 1	5 13	Died 10 days after operation			
4	6	F	n.k.	7 0	7 10	10	9	10 B.-f. first 4 wks of life
5	8	M	8 12	10 2	10 2	7	4	B.-f. first 5 wks. of life
6	3	F	8 8	5 12	6 4	13	10	8
7	5	M	5 5	5 6	6 5	14	11	15
8	4	F	6 8	5 1	6 0	6	5	15
9	6	M	9 8	7 14	8 3	21	9	5
10	3	M	10 0	8 8	9 9	8	9	1 1
11	8	M	4 2	3 8	4 9	21	20	1 1 A.B.-f. twin
12	3	M	7 12	6 15	7 11	12	9	12 A.B.-f.
13	10	M	8 8	6 14	7 10	12	12	12 A.B.-f.
14	3	M	7 10	6 8	7 4	9	7	12 Twin
15	4	M	7 12	6 11	7 8	20	19	13
16	6	F	7 13	7 1	7 4	19	15	3
17	4	M	6 2	5 8	6 3	16	16	11
18	4	M	7 8	6 12	In hospital 18 days. Died 5 days after operation			
19	6	M	7 2	8 0	8 5	14	5	5
20	8	M	7 4	8 13	8 14	19	13	1
21	8	M	3 8	3 15	5 2	27	26	1 3 7 *month prem.* twin
22	5	F	8 0	9 6	10 0	13	11	10
23	0	F		5 10	7 1	67	64	1 7

B.-f. = Breast-fed.
A.B.-f. = Given stored breast milk after operation.
n.k. = Not known.

TABLE III.—*List of Bottle-fed Babies in* 1938

No.	Age in Weeks	Sex	Birth Weight	Weight before Operation	Weight on Discharge	No. of Days in Hospital (total)	No. of Days after Operation before Discharge	Gain in Weight
			lb. oz.	lb. oz.	lb. oz.			lb. oz.
1	9	F	8 8	8 6	9 4	17	16	14
2	7	M	7 8	7 13	8 8	13	11	11
3	8	M	6 13	6 8	Died 11 days after operation			
4	10	F	4 12	7 3	7 5	10	7	2
5	12	M	10 10	9 15	10 7	9	7	8
6	6	M	6 8	6 12	6 14	11	10	2
7	8	M	7 0	6 11	7 2	7	6	7
8	6	M	7 12	6 7	6 12	15	15	5
9	4	M	7 7	7 5	7 12	13	12	7
10	7	M	7 6	6 9	7 8	8	7	15
11	8	M	8 8	8 1	8 2	12	6	1
12	4	M	8 3	7 14	8 3	8	6	5
13	4	M	6 0	5 9	5 15	11	10	6
14	5	M	8 8	8 4	8 7	8	7	3
15	7	M	8 4	7 0	7 13	12	11	13
16	16	M	6 8	6 6½	Died 8 days after operation			
17	5	M	7 4	8 0	8 4	12	8	4
18	6	M	9 0	7 15	8 5	12	7	6
19	6	M	6 [illegible]	6 12	7 2	9	9	6
20	7	M	n.k.	5 4	5 7	8	7	3 Twin
21	3	M	11 0	9 9	11 1	10	10	1 8
22	3	F	5 0	4 7	4 12	10	6	5
23	8	F	5 12	7 4	7 7	6	6	3

The child was eventually brought to the hospital when 8 weeks old, weighing 6 lb. 5 oz. It was operated on after preparation lasting three days. The infant made good progress (Chart IV) and gained weight till the sixth day following operation. It then developed gastro-enteritis and died on the eleventh day. This child should have been examined for a hypertrophic pyloric sphincter when it started to vomit while on breast milk.

A child appears to lose its immunity to gastro-enteritis if once it is taken off the breast. Never take a young infant off the breast, provided the mother is well, till the presence of pyloric stenosis has been definitely excluded. It should be regarded as axiomatic that breast milk never disagrees with an infant. This should be taught to students, nurses, midwives, and welfare and social workers of all kinds.

The advantages of a short period of treatment and early charge from a hospital ward are unquestioned. Surgery vides this.

The problem of the control of gastro-enteritis among tle-fed babies admitted to institutions is urgent for h physician and surgeon. Gastro-enteritis is the one iger to be feared in a child with pyloric stenosis ether medically or surgically treated, and its risk is portional to the duration of hospital treatment The iger is less with surgical treatment, which requires a in hospital of only eight days, than with medical tment, which takes longer.

Three typical charts, I, II, and III, are the records three infants operated on consecutively at the Infants spital on November 21 and 25, 1938. Two of the ldren were discharged on the eighth day following opera-, one having gained 12 oz. and the other 14 oz The aining child was discharged on the ninth day, having ned 14 oz. These charts are reproduced to show the idity of the improvement to be expected following cessful surgical intervention.

Technique

Prolonged pre-operative preparation is neither neces-y nor of great value. The administration of large antities of saline subcutaneously and intravenously is advised. The best way to give fluids to an infant by mouth, and the sooner the child can be placed in osition whereby it can benefit by fluid given by mouth better. Hence the sooner operation is performed the ter. The operation should be preceded by gastric age. The lavage is not given in an attempt to cure chronic gastritis, as it is difficult to believe that lavage have much effect on gastritis so long as the pylorus obstructed. Lavage is to empty the stomach of its tents and so prevent decomposing food from enter-the intestine, and to empty the stomach of gas. It uld be done a quarter of an hour before operation. a child whose stomach is full of gas is restless under al anaesthesia. Apart from this gastric lavage, no further e-operative measures are advocated or adopted. No lative or other form of premedication is necessary or sirable. The child is operated upon in a theatre the mperature of which is as near to 80° F. as possible. such a theatre is not available the child should be ced on the operating table upon two partially filled bber hot-water bottles. The temperature of the water the bottles should be tested with a thermometer, and ould be 100° F. Local anaesthesia is invariably used, d is produced by means of 1% ethocaine with or with-t adrenaline. Never more than 10 c.cm. of this solution required. These are important factors in eliminating ock. A midline incision is found to be most satisfactory. to 5 c.cm. of ethocaine should be placed sub-taneously along the line of the proposed incision. A tle less than this quantity should be divided between e rectus of each side. The remaining 3 to 4 c.cm. ould be placed deep to the linea alba—i.e., in the sub-itoneal space. The whole procedure can be carried t through two skin punctures. It is very important not eviscerate the child. Nothing should be allowed to ave the abdomen other than the hypertrophic pyloric mour. This can be delivered by the use of two pairs plain dissecting forceps. It is not necessary for the erator to put any part of the hand into the peritoneal ity. The peritoneum and muscle coat is incised down the mucosa and the abdomen is closed. The closure surprisingly easy, as the peritoneum comes together thout tension.

In a recently published textbook on surgery for udents one finds this statement: "Speed is highly important, and the mortality will depend upon the surgeon's skill." Gentleness is more important than speed. And if the child is under local anaesthesia, and the theatre is warm, speed is of little moment. The essentials of after-treatment consist of guarding the child from the "dangers of gastro-enteritis" and the slow gradual resumption of normal feeding. Appended are feeding charts which have been reproduced from the latest edition of the Infants Hospital *Pharmacopoeia*.

Congenital Pyloric Stenosis Post-operative Feeding

Artificial Feeding: Commence Three and a Half Hours after Operation

Hours after Operation		
3½	1 dr.	7.5% glucose in half-strength normal saline
4	1 dr.	do.
4½	1 dr.	do.
5	1 dr.	do.
5½	1 dr.	do.
6	1 dr.	do.
6½	1 dr	do.
7	1 dr.	do.
7½	1 dr.	Half-strength ½ Cr. C. & G. Special
8½	2 dr.	do.
9½	3 dr.	do.
12	4 dr.	Full-strength ½ Cr. C. & G. Special formula
13½	6 dr.	do.

Hours after Operation		
15½	1 oz.	Full-strength ½ C. & G. Milk Mixture
17½	1 oz.	do.
19½	1 oz.	do.
21½	1 oz.	do.
23½	1½ oz.	do.
25½	1½ oz.	do.
28	2 oz.	do.
31	2½ oz.	do.

Then 6 × 3 for 12 hours and thereafter increased according to *directions*. Water by mouth in small quantities between feeds p.r.n.

Formula (Full Strength)

½ Cr. C. & G. Special	2½ *dr.*
Dextrimaltose	1 *dr.*
Water	2½ *oz.*
Lactic Acid (*B.P.*)	10 *drops*

Breast Feeding: Commence Three and a Half Hours after Operation

Hours after Operation		
3½	1 dr.	7.5% glucose in half-strength normal saline
4	1 dr.	do.
4½	1 dr.	do.
5	1 dr.	do.
5½	1 dr.	7.5% glucose in half-strength normal saline + ½ dr. breast milk
6½	1 dr.	7.5% glucose in half-strength normal saline + 1 dr. breast milk
7½	1 dr.	do.
9	3 dr.	Breast milk
10½	4 dr.	do.

Hours after Operation		
12	6 dr.	Breast milk
13½	1 oz.	do.
15½	1 oz.	do.
17½	1 oz.	do.
19½	1 oz.	do.
21½	1 oz. 2 dr.	do.
24½	1 oz. 2 dr.	do.
27½	1½ oz.	do.
30½	1½ oz.	do.
33½	1 oz. 6 dr.	do.
36½	1 oz. 6 dr.	do.
39½	2 oz.	do.

Then six or seven feeds three-hourly. Baby put to breast if condition allows two to three days after operation.

Summary

A series of 100 consecutive operations on breast-fed infants for pyloric stenosis is reported without a death.

A similar series of 46 operations on bottle-fed infants resulted in 5 deaths, all from gastro-enteritis.

The practical implications of these results are discussed, and it is pointed out that statistics comparing medical and surgical treatment of pyloric stenosis are worthless unless accompanied by information as to the method of feeding.

I should like to thank the physicians at the Infants Hospital for allowing me to publish the records of the patients admitted under their care.

Stockholm has a scheme for collecting and distributing mother's milk for sick children. At a special centre at the principal milk distributing company nursing mothers who have more milk than their children require are examined free of charge by a physician, including x-ray examination of the lungs, blood tests, etc., and are supplied with sterilized bottles into which the milk is pressed directly from the breast. The milk is paid for at the rate of 4 kronor (4s.) a litre and as little as 1/4 litre or even less a day is accepted. The bottle is left at the nearest of the milk company's shops and taken by the company to the centre, where the contents are examined, pasteurized, and then placed in refrigerators.

OPHTHALMIC CASUALTIES RESULTING FROM AIR RAIDS

BY

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We are now becoming familiar with the types of ocular injury which result from air raids. They usually occur in conjunction with other injuries and are regarded as of secondary importance, particularly during the first few days of treatment. I have had the experience of preparing an ophthalmic hospital which was closed again before any emergency arose, and of starting from " scratch " immediately after a big air raid in a hospital unequipped for ophthalmic work. It has shown me that an ophthalmic hospital as such is impracticable except for protracted cases, and that the ophthalmic surgeon must be prepared to take his instruments and equipment to any centre where his services may be required. He may be met by a total absence of ophthalmic nursing and a lack of appreciation of the importance of vision in a patient who has multiple other injuries. These difficulties can be overcome, but I mention them in the hope that those who are in charge of E.M.S. hospitals will bear them in mind. The provision of ophthalmic drugs, a skeleton set of instruments, and the inclusion on the staff of one or two nurses with ophthalmic training would greatly facilitate matters. If possible some provision should be made for the ophthalmic surgeon to operate elsewhere than in the main theatre, since the latter is likely to be occupied continuously by general surgeons for several days after a raid.

Types of Injury

There appear to be three main causes of ocular injury: (1) explosive incendiary bombs; (2) the sudden compression and expansion of the atmosphere caused by blast; (3) direct blows on the eye.

The resulting injuries present certain features and problems of treatment which are new to the ophthalmic surgeon, and an outline of my observations on approximately 100 cases may therefore provide an interesting comparison for ophthalmic surgeons in other large cities. These notes were made after the raids in October and November, 1940, and have been modified by further experience.

Effects of Incendiary Bombs

In a mild degree the effect of an incendiary bomb was that of multiple foreign bodies—particles of sand and oil were embedded in the eyelids, conjunctivae, and corneae. Whenever possible the foreign bodies were removed from the cornea immediately, flavine oil and atropine was instilled, and when only one eye was affected the patient was able to return home: the eye usually became quiet in one or two weeks.

There were, however, many cases in which the eyes had been burned, and usually both eyes were affected. The lids and conjunctivae swelled, and the corneal epithelium was too oedematous to admit of removal of the foreign bodies for perhaps a week. The patients suffered severe pain and had to be removed to a base hospital, where they made a slow recovery. It was found by experience that metycain and merthiolate ointment gave great relief in the initial stages, without any ill effects on the cornea. Atropine was also adminstered, and, later, saline lotion and collosol argentum drops were employed. It was found better to remove the foreign bodies a few at a time. In one case in which a large number were removed from both corneae a week after injury an alarming infection followed within forty-eig hours; there was a general rise in temperature, and a corne abscess and hypopyon developed in both eyes. Large dos of sulphapyridine were given, followed by graduated intr venous injections of protein-shock T.A.B. Both eyes we retained; one had 6/12 vision, but in the other there was perforated cornea.

I was impressed by the softening of all the ocular tissue In addition to the softening of the cornea I noticed a pe sistent oedema of the conjunctiva; sutures put into flaps cover a perforating injury very quickly cut out, and ma cases showed lymphatic blebs in the conjunctiva which pe sisted for weeks after the injury. The sclera, too, appear to be oedematous, for two cases in which deep bu penetrated to the sclera, developed a spontaneous ruptur and prolapse of the vitreous several days after injur Secondary infection was rare, but in one case a most intrac able attack of superficial punctate keratitis occurred. T resulting vision was usually good, except in the few cas with infection of the cornea, but the eyes remained irritab and injected for many weeks, and there was permane staining of the conjunctivae.

In addition to the injuries already described, incendia bombs often caused burns of the eyelids and face whi were usually superficial and which were best treated wi sterile petroleum jelly. This facilitated the dressing of t eyes and retained the mobility of the lids.

In contrast to these, deep burns of the eyelids occurr in conjunction with extensive burns of the face in firem and A.R.P. workers directly exposed to fire. The ey themselves were usually uninjured, and this enabled t gentian violet - silver nitrate treatment to be used in t first instance, followed by petroleum jelly when the low lids became softened by lacrimation. Contraction was ve apt to occur, and necessitated stitching the eyelid margi After three months two cases were treated successfully wi Thiersch grafts.

Effects of Blast

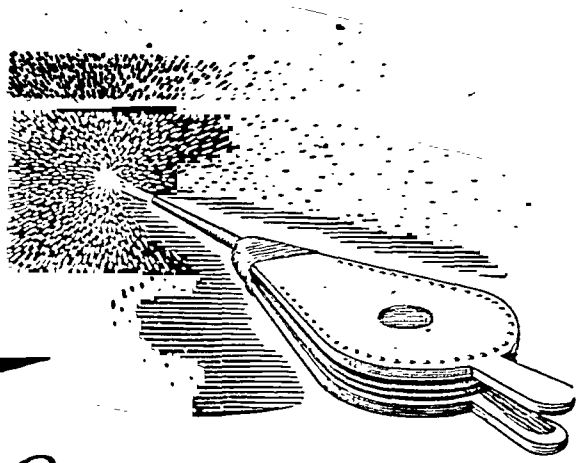
Some peculiar effects on the eye of sudden compressi and expansion of the atmosphere were noticed: (a) Pro tosis due to a sudden retrobulbar haemorrhage causi immediate total loss of vision: the usual signs of evulsi of the nerve were absent, yet subsequent optic atrop occurred. (b) Extensive intra-ocular haemorrhage eith from an iridodialysis in which the iris vessels were to through, or from a torn retinal vessel. (c) One or more ru tures of the choroid appearing as crescentic tears near t optic disks: these were quite different from the famili contusion changes of the retina and were accompanied small haemorrhages at the macula, with loss of centr vision. (d) Acute iritis and acute secondary glauco occurred in several cases about a week after injury. The were slow to recover. Investigations were made for a constitutional factor, but they appeared to be due entire to trauma.

Effects of Direct Blows

Perforating injuries of the cornea and rupture of t sclera from a direct blow were common injuries, and usuall the eye had to be removed. Several cases showed a seve traumatic keratitis with multiple folds in Descemet's mem brane. Although the cornea cleared well there were alway associated contusion changes in the retina, particularly the macula, giving rise to defective vision. Several cases penetrating wounds of the orbit occurred in which lar particles of wood and glass were buried deep in the tissue but the sinuses healed up well, as did wounds of the eyelid There were no cases of intra-ocular foreign bodies requirin the use of the magnet.

Stimulant

OF THE VITAL CENTRES



BRITISH MADE **Coramine** TRADE MARK REGISTERED

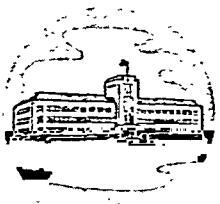
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Large doses at the critical moment
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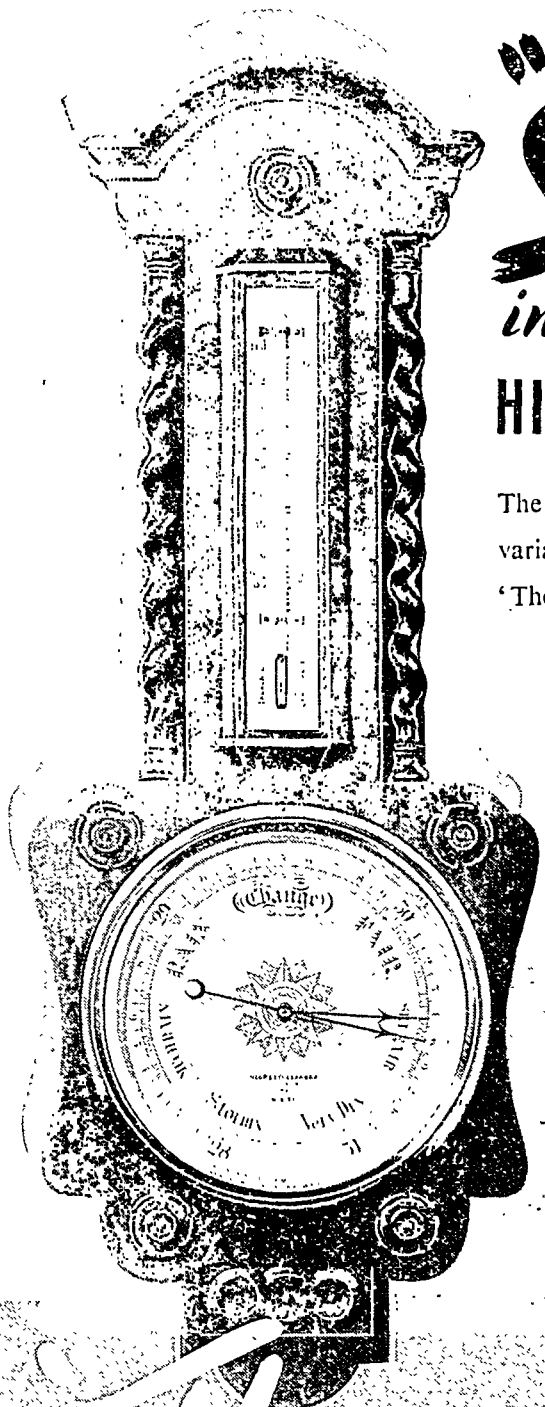
J. R. Naval med. Service (1940), 2, 138.

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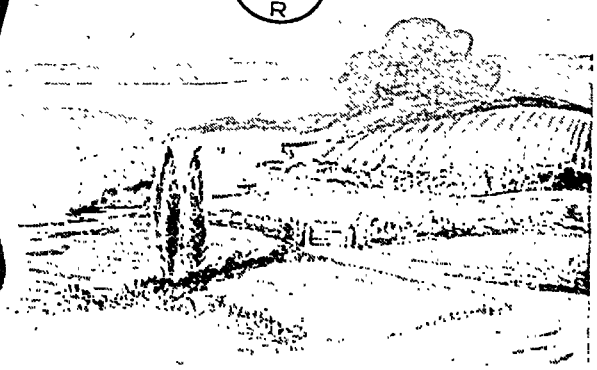
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Medical Memoranda

Flat-foot in Recruits

To anyone who has been responsible for the medical supervision of recruits it becomes obvious that the condition of flat-foot in all its varying degrees is by far the commonest cause of doubtful efficiency; and it is, I think, experience alone that guides one in the most satisfactory disposal of these cases. I have therefore collected statistics as complete and accurate as possible relating to the incidence methods of treatment, and progress of all cases of flat-foot in an infantry battalion during its first six months of training.

All degrees of flat-foot have been encountered. The "severe" form, in which the head of the talus has gone right over and the flatness is "complete," causes least trouble. Some men with this condition are placed in a category barring them from an infantry regiment. Of those who are not the majority have no trouble with their feet at all, they can perform long route marches, and suffer only from blisters occurring through pressure on the boot. It is a recognized fact that the severest pain is always caused by the high arched foot beginning to give way, and I have amply proved this in my limited experience.

Treatment

I was guided by the *Army Manual of Chiropody*, Mercer's *Orthopaedic Surgery*, and that excellent monograph *Military Orthopaedics*, written by Sir Robert Jones during the last war.

Exercises.—At first I enthusiastically ordered the exercises advocated by the *Army Manual of Chiropody*. To ensure that these were correctly performed I arranged for a class to be held during the times set aside for P.T., and this was supervised by one of my medical orderlies. Sir Robert Jones stated: "If the principle of deviation of body weight on to the outer edge be loyally adhered to every ordinary case will recover, even without special tiptoe exercise." My results, however, were discouraging, and after about six weeks I discontinued this altogether. The crux lies in "loyally adhered to," and it is a crux which I considered impossible to overcome satisfactorily.

Strapping to Support the Ankle.—I did not consider this method of treatment. I had a rise of one-quarter of an inch, or one-third of an inch, according to the severity of the condition, put on the under-side of the heel and sole of both boots. At first I met with a barrier of resistance from the cobbler, who, despite most elaborate instructions and diagrams, would insist on putting a rise on the inside under the arch of the foot. This invariably aggravated the symptoms! However, I succeeded in the end in getting what I wanted.

Alteration to Boots.—This I found was the only satisfactory

Rest.—In the limited number of more acute cases which occurred a week's rest with no additional treatment was enough.

Results

Altogether 30 men reported sick with symptoms caused by fallen arches. There were 33 other men in the battalion with marked degree of flat-foot, as evidenced by footprints and arance—some with extreme splaying and eversion—who r complained. These were all of the first or second ree, in so far as the arch can be restored. Some of them exceptionally good walkers, and all have been for route rches, reminding one of the story told of the last war, en hundreds of American Indians were said to have walked thousand miles to enlist at an eastern town. On being amined they were turned down on account of "flat feet." Whereupon they proceeded to walk the thousand miles back again! It is, however, significant that of these 33 cases of "accidentally" discovered flat-foot there were just over twice as many in "HQ" company (drivers, signallers, etc., who had little marching to do) as in any one of the other companies.

Of the 30 men who complained 14 have already been before a medical board or are waiting to do so—these I class as failures; 6 are still under treatment; 4 have left the station, and so are out of touch; and 1 who only had blisters under the sole is recovering. Of the 14 who have been "boarded" 7 did not complain until the sixth month in the Army, when training became very much more severe, and all the 6 who are still being treated did not complain till the sixth month of training. The results of the 30 cases are therefore as follows: 14 failures, 6 successes, 4 lost touch, 6 doubtful. At least 3 of the last group were probable failures. Thus we have 17 probable failures out of 26 followed-up cases.

Conclusions

The conclusions which I have drawn from these figures are as follows: (1) In cases of flat-foot exercises with the limited facilities afforded by a regiment "in the field" are useless. (2) Any case which fails to respond to treatment within three weeks should be "boarded" without delay. (3) In the examination of recruits very little regard should be paid to the appearance of flat feet, and very much regard to the "foot history" of the patient. This would help to avoid the time wasted by men carrying on until training became severe at the end of six months and then "cracking up." The 14 "failures" had together already wasted six years' training.

I should like to express my thanks to Sergeant Fraser for the great care with which he kept the records of all my patients.

R. T. BURKITT,
Captain, R.A.M.C.

A Case of Prolonged Gestation

The case reported below seems to be worth recording for its medico-legal significance.

Case Record

The patient, a healthy, cheerful, and intelligent woman of about 9 stone, aged nearly 35, did not begin to menstruate until the age of 18. The menstrual cycle has always been a consistent 56 days, regular and painless. By her first husband she had two healthy children—a girl aged 12½ who weighed 9 lb. and had one tooth at birth, and a boy aged 10 who weighed 7½ lb. Both pregnancies were abnormally long—"about an extra month." The first labour was prolonged (four days), and was ended by forceps; the second labour lasted two and a half days, but was otherwise normal.

As the result of a motor crash she was told that it was unlikely she would have more children, and when she married for the second time she took no precautions against becoming pregnant. Her second husband went on war service on March 15, 1940, leaving her with her father and mother, both over 80, on a small-holding on Dartmoor. Her period had ended on March 8. Before the end of March she had symptoms which from her previous experience convinced her she had become pregnant.

By December an active child in normal vertex position occupied an apparently full-time uterus. At nine and a half, and again at ten, months quinine was tried to induce labour, with no other result than "an extra good night's sleep." On February 7 she delivered herself in eight and a half hours of a healthy male child weighing 8½ lb., fully mature and with the fontanelle more closed than usual.

The grandmother was nearly 48 when the patient was born, and all five of her children were carried "over-long." but no exact data can be obtained. March 14 to February 7 is 330 days.

Newton Ferrers. W. F. BENSTED-SMITH, M.B., B.Ch.

The existing arrangements whereby local authorities were authorized at the expense of the Exchequer to provide nursery schools for children under 5 who had been evacuated are to be extended, and Wartime Nurseries for all children under this age, including those of women in employment (whether the latter have been evacuated or are local residents) are to be established in all areas according to local needs. They may be part-time nurseries open approximately during school hours or whole-time nurseries open for periods up to 12 to 15 hours, and medical officers of health are to make arrangements for the regular medical inspection and supervision of the children.

Reviews

PERVADING INTELLIGENCE

Life Magnificent. By Henry Atkinson. (Pp. 316. 7s. 6d. net.) London: Watts and Co. 1941.

The human brain was not developed for the purpose of thinking about the illimitable but to enable man to contend with his immediate environment; therefore reason, being dependent on the brain, cannot really grasp abstractions. Nevertheless, his boundless curiosity will always urge man on to a pursuit doomed to inevitable failure, but yielding many rewards by the wayside. This we take it is the purpose of Mr. Henry Atkinson's *Life Magnificent*, in which he emphasizes two principles—an all-pervading intelligence in the universe, and the non-intervention of any power external to that intelligence. This is not quite so remote from Bishop Berkeley as the author seems to think. It is too often forgotten that the bishop did not claim that material things only existed in our thought, but, with Plato, that they also existed in the mind of deity. True he differs from them when he says that "intelligence is within the universe, within existing things, within all development, not outside it, and that in consequence everything consists of Intelligence itself." But when he goes on to say, "Intelligence has developed in the same manner as that of man and all organic forms; it is not an autocratic dictator . . . it knows no more of what man may become than man himself does; it endeavours to tune existence to finer harmonies," he is really in agreement with the philosophy of Prof. S. A. Alexander, though starting from different premises. The author was led to his conclusions from watching the healing of a simple wound, a profoundly impressive spectacle to any thinking mind, which convinced him that here was an obviously intelligent sequence. He argues back to the postulate of a primitive unit which he labels the mitron and maintains that, if we reject the development of the universe from the movements of such a primitive particle by means of its own intelligence, we must accept the separate creation of all sorts of energy and matter which have adjusted themselves to one another by a truly marvellous series of miracles. The physicist suggests that his waves which result in definite impressions on our senses have no material existence; Mr. Atkinson suggests that "if one can swallow that camel, there need be no straining at the gnat of Intelligence."

This thesis is skilfully maintained by abundance of scientific illustrations ranging from spiral nebulae to sociology. It is a pity therefore that the index should be wholly inadequate to a book of this importance. For the author is anxious to turn his theories to practical use in the conduct of life by showing how the evils of the artificial conditions of man's present physical and mental life lead frequently to disaster, and how his future welfare depends on the perfect association between his individual intelligence and that of his environment. By way of illustration he asserts that perhaps the greatest tragedy of mankind was the disappearance of Cro-Magnon man some 20,000 years ago, for he regards this as a higher type than the one from which the existing races developed. It is indeed a recurrent tragedy that the more civilized races tend to be destroyed by the more brutal when they have acquired an ease of living which gives them a higher sense of values. It is a tragedy which impends like a sword of Damocles over civilization to-day.

Space forbids more extensive quotations, but we cannot omit the author's criticism on the laboratory attempts to interpret the nature of matter from the results of violent ...tting of the atom: "Are we to discover the intelligence involved in the erection of a noble cathedral from th manner in which it is blown to pieces?" We must l content simply to refer the reader to his views on th origin of life (p. 207).

The book "is addressed to Youth, because only you will dare to tread a path so startlingly new." Yet its new ness is not so subversive of older philosophies as to rend its pages unpalatable to those of riper years, who are alive to our present dangers as are the most callow. W have read it with great interest, though we might sugge as a more descriptive if less sensational title, "Th Immanence of Intelligence."

THE BIOGENIC AMINES

Die biogenen Amine. By M. Guggenheim. (Pp. 564. No price given.) Basel and New York: S. Karger. 1940.

Dr. Guggenheim has long been recognized as the outstan ing authority on the amines present in organisms, and a biochemists will therefore welcome the appearance of th third edition of his monograph on the biogenic amin and their importance for the physiology and pathology vegetable and animal metabolism. The last editio appeared in 1924, and knowledge in this field has advanc greatly since that date; hence the present volume is pra tically a new work. The author remarks that the increa in knowledge has been so great that it is no longer possib to make a complete presentation of the subject in a sing volume.

The monograph gives a full account of modern kno ledge of well-known and important amines such as acety choline, histamine, and adrenaline, and also provides systematic survey of their less famous relatives. Th latter feature is of special importance because is so much easier to obtain information about wel known substances than about substances which ha not attracted general attention. Besides describing th amines that occur in nature the author also mentio the additional forms produced by the organic chemist. Th number of these precludes more than a bare descriptio For example, a simple list of the known phenyl alk amines occupies ten pages, while a similar list of th homologues of choline occupies eight pages.

Dr. Guggenheim has managed to compress an enormo amount of information into a single volume, and bi chemists and physiologists in general will be very gratef to him for the labour he has expended in providing a authoritative account of an important and difficult subjec

APPLICATIONS OF X RAYS

Applied X-Rays. By George L. Clark, Ph.D., D.Sc., Professor of Chemistry, University of Illinois. Third edition. International Series in Physics. (Pp. 674; illustrated. 42s.) London: McGraw-Hill Publishing Company, Ltd. 1940.

The third edition of this book contains an up-to-dat account of the applications of x rays in science an industry. The direct medical interest in the work is ver limited. A paragraph or two are spared to the subje of medical radiography. There is a fairly comprehensiv chapter on the biological effects of x-radiation, whic includes a brief outline of work on radiogenetics. Th effects of radiation on normal and pathological tissue a summarized. This part is of restricted value from i very brevity. For example, on page 213 the statemen "28 and 34 per cent. respectively of an erythema dos (600 r), effective in the ovaries, will produce temporar and permanent sterilization" has little value without refe ence to the patient's age; and the "statistics of the cance problem" can hardly be summarized adequately in a sho paragraph of a dozen lines, as on page 219.

The technique of radiotherapy does not come into the scope of the work. The physics of x-radiation are dealt with concisely and clearly, though the chapter on "Scattering and Absorption" is too sketchy to be very informative. There is a condensed account of the modern method of describing the vector model of the atom. A superficial knowledge of the rules of quantization is assumed.

The main interest of the work lies in the last two-thirds, which is devoted to an excellent account of x ray analysis of the ultimate structure of materials, both organic and inorganic. Of particular merit is the chapter on the fundamentals of crystallography and x-ray methods of crystal analysis, which will prove helpful to research workers taking up this study. The later chapter on the interpretation of diffraction patterns presupposes familiarity with the complex mathematics of the atomic and crystal "structure factors." Finally there is a discussion of some practical applications in the metallurgical industry and in the study of synthetic materials.

Notes on Books

Dr. HUGH MORRIS's *Medical Electricity for Massage Students* was commended in these columns as a clear and practical textbook when the first edition appeared six years ago. A second edition is now published by J. and A. Churchill at 8s., and the author in his preface says that it differs so much from the first that it is really a new book. He has revised and compressed the material, and added new chapters on diathermy and ultra-violet rays. It is essentially for the groundwork it provides that Dr. Morris's book is valuable, and mastery of its contents will give a sound basis for all the more advanced electrical work.

A second edition has been published by Dale, Reynolds and Co., Ltd., at 1s. 6d., of Major NORMAN HAMMER's pamphlet *First Aid for War Casualties*. This handy practical guide first appeared in September, 1940, and went rapidly through four reprintings. The material has now been brought up to date and enlarged. In its revised form the pamphlet will no doubt have a ready sale among those engaged in civil defence first aid work. The author has had large experience in ambulance work, and was for some time medical adviser to the Home Office A.R.P. Department.

A review of Dr. ALBERT C. SNELL's *Treatise on Medicolegal Ophthalmology* appeared in the *Journal* of May 17 (p. 753). The publisher of the book in this country is Henry Kimpton.

Preparations and Appliances

FIXATION OF SKELETAL TRACTION PINS

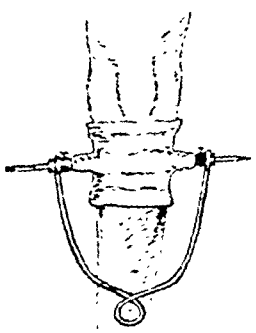
Mr. D. V. MARSHALL, M.B., F.R.C.S.Ed., F.R.F.P.S.G., writes:

At the Beverley Road Hospital, Hull, some five years ago skeletal traction for the treatment of fractures of the lower extremity requiring prolonged extension was adopted almost as a routine. It was found that, apart from the accepted general efficacy of the method, the nursing of the cases was made much easier and pressure sores of all kinds were avoided.

Many of the patients who had to be treated were elderly, in poor condition, restless, non-cooperative, and occasionally demented. It was noticed that when through these causes the transfixion pin slipped transversely or by rotation, or because it had not been driven at right angles to the traction axis, infection developed at an early date. In other cases, where there was no slipping or working on the pin, infection did not occur. These results were noted constantly, irrespective of whether the skin wounds around the pin exits were dressed by various methods or left exposed. Having regard to these observations, attempts were made to devise some mechanical means to prevent the pin moving either transversely or by rotation in the tissues. Experiments were tried with various distance pieces screwed on the ends of the pin impinging on the bone through the soft tissue, and with fins on the pin (Smith Petersen style), but the results were not encouraging, and the apparatus was costly to make up. Accidentally, it was discovered that an arrangement with plaster-of-Paris described later solved the problem.

The results have been so consistently good, whether used in the elderly, the demented, children, adults, or air-raid casualties, that it is felt the method is worth recording.

The average case under my care has the pin left in until the need for extension ceases, usually eight weeks, with gradual reduction of the weight from six weeks onwards. On many occasions the pins have been left in for ten to twelve weeks.



In no case has there been any sepsis or trouble of any kind, and all the pin tracks have healed at once when the pins were removed. I have not noticed the method in use in any other hospital, or heard of it from other surgeons, though it is more than likely that others have devised similar measures with similar results.

The method is shortly as follows: A Böhler's or Steinmann's pin is introduced through the tubercle of the tibia, condyles of femur, or os calcis, or other site, as may be suited to the particular case. The skin around the pin is painted with picric or a similar antiseptic, and a paster-of-Paris bandage is applied immediately around the leg and pin in the form of a collar three or four inches wide. The distal and proximal margins of the plaster collar are prevented from pressing injuriously upon the skin by pieces of white felt. The extension stirrup having been applied, distance pieces integral with the collar are formed by winding the bandage round the pin outward to the stirrup bushes. The plaster is moulded carefully with the hands to fit leg and pin as it sets, and no dressing is used between the skin puncture and the plaster.

The method has been found satisfactory even when the pin is not driven square and it can be used to give oblique traction in fracture-dislocations of the ankle or knee. The accompanying sketch illustrates the arrangement.

The annual general meeting of the London and Counties Medical Protection Society was held on June 18 under the chairmanship of Sir Cuthbert Wallace. The annual report stated that during the past year 1,192 practitioners had been elected to membership, 917 of them within twelve months of their registration. The losses by death, resignation, or default numbered 699. Over 1,000 applications for advice and assistance from members were received during 1940—a decrease as compared with the previous year, but including a larger number than usual of serious cases. It is pointed out that no practitioner, however competent or discreet he may be, and to whatever branch of the profession he belongs, is immune from litigation on account of his professional work, and that practitioners holding Government or municipal service posts have just as much need of protection as those in general or private practice. Service with H.M. Forces does not relieve an individual of his civil obligations, and the experience of the past year has demonstrated the soundness of the advice given to Service members that they should continue their membership. A few of them have resigned in spite of this advice, and some have realized later that such discontinuance was unwise. During the year over 600 matters were referred to the solicitors, many of them concerning altered circumstances arising out of the war. An unusually large number of cases have been defended in the courts, mostly with satisfactory results. The accumulated funds of the Society amount to just upon £80,000. At the meeting Sir Cuthbert Wallace was re-elected president, Dr. G. F. Stebbing chairman of council, Mr. W. M. Mollison treasurer, and Dr. R. W. Durand secretary.

BRITISH MEDICAL JOURNAL
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THE DANGERS OF DUST

One of the major lines of medical progress during the present war has been the study of air-borne infection. The effect of this intensified study has been profoundly to alter our conception of how infection is spread through the air, and in fact largely to restore beliefs which were chiefly current half a century ago. Dust has always been recognized as a vehicle of infection, but it was relegated to a secondary status by Flügge's work on the aerial dispersion of fluid particles from the upper air passages, and "droplet" infection has been regarded almost throughout this century as the principal mechanism by which pathogenic bacteria of many kinds are able to travel from person to person. This belief had to be qualified more recently in view of Wells's work on the behaviour of fluid particles in air: he showed that in an ordinary atmosphere a drop of fluid either falls to the ground or, if smaller, evaporates before it reaches the ground, leaving a "droplet nucleus" which remains suspended in the air. These particles if derived from natural secretion would consist of dried mucus containing bacteria which are known to be capable of survival in them for hours, or even days. Droplet infection of the more distant kind was thus merely translated into terms of droplet nucleus infection: the material concerned is certainly dust, if you will, but the supposition remains that suspension in the air continues until the micro-organism reaches a new host.

It is chiefly in connexion with streptococcal infections that even this qualified belief in Flügge's original doctrine has now apparently to be abandoned. To apply conclusions recently reached about the behaviour of pyogenic streptococci outside the body to infectious disease generally is unjustified; it remains possible, and indeed likely, that purely aerial spread is the important mode of transmission of some of the specific fevers and of many infections involving the air passages and lungs. We have little new knowledge on these subjects: on the epidemiology of streptococcal infections we have much. There have been strong motives for acquiring it, of which the foremost was the deplorable mortality from puerperal fever. There is a peculiarly exact method of acquiring it, thanks to the immense achievement of the late Frederick Griffith in establishing the thirty serological types of *Streptococcus pyogenes* by which his name will always be remembered. Aided by this delicate means of tracing the migration of a streptococcus from patient to patient, ward epidemics have been increasingly studied, and it is now widely known that under the average hospital conditions one patient may infect many others, the manifestations often varying from case to case, taking the form of a wound infection in one and a throat infection or otitis media in another. These epidemics have always existed, particularly among children, and (as was first clearly pointed out by the late C. C. Okell) in ear, nose, and throat wards; they become a major and constant problem where large numbers of war wounds have to be treated. Exactly how infection spreads in these circumstances is therefore a question of the first importance.

There are certainly two main avenues to be considered, one of which is contact infection. That imperfect technique does lead to the direct transference of streptococci, particularly from wound to wound, has been well brought out by the recent observation of A. A. Miles and his collaborators.[1] The alternative route is aerial, and here the patient suffering from a throat infection or the "throat carrier" has been looked upon as the usual source, and the vehicle of infection as the infected particle suspended in the air. There are two reasons for altering this view. One is the recent work of R. Hare,[2] who studied the expulsion of infected droplets by streptococcus carriers by an ingenious method involving the exposure of blood-agar plates disposed round an arc of a circle whose centre was the carrier's mouth. He found that haemolytic streptococci are ejected only in comparatively small numbers, and that they are contained chiefly in large droplets which fall rapidly, forming colonies only on those plates in his experiments which were below the mouth rather than on those level with it. There is much conflicting evidence about the extent to which bacteria are ejected from the mouth in talking, and a factor often overlooked is that pathogens may be localized in a particular area in the throat, whereas indicator bacteria such as *Chr. prodigiosum*, used in experiments on this point, are universally distributed throughout the mouth. Earlier observers have also failed to detect the expulsion of haemolytic streptococci by carriers in a manner and on a scale which would explain their supposed aerial infectivity. On the other hand, while the suspended droplet has been slowly falling into discredit, dust as a vehicle of infection has been receiving more and more attention and the support of many practical observations. We referred recently[3] to the studies of H. D. Wright and his colleagues on cross-infection in diphtheria wards: they found large numbers of virulent diphtheria bacilli in ward dust and established that these were capable of survival for at least a month. That haemolytic streptococci can exist in the same medium has been proved repeatedly, and ward dust, particularly that shaken up during the process of bed-making, must now be regarded as a major source of danger.

There are two ways of combating this, directed respectively to the floor and to bedclothes. The treatment of floors with spindle oil, as recommended by M. van den Ende, D. Lush, and D. G. ff. Edward,[4] is simple as well as effective. The "oiling" of blankets, which are readily contaminated by patients and at the same time a prolific source of ward dust, is not so easily carried out. When the necessary apparatus is available the result is not disagreeable to the patient, and the effect is striking. With the collaboration of van den Ende the process has been given a practical trial in two hospitals, experience in one of which he describes with E. T. C. Spooner,[5] while in another the results are

[1] *British Medical Journal*, 1940, 2, 855, 895.
[2] *Canad. publ. Hlth. J.*, November, 1940, 539.
[3] *British Medical Journal*, February 15, p. 247.
[4] *Lancet*, 1940, 2, 133.
[5] Ibid., 1941, 1, 715.

scribed on page 983 of our present issue by Wing-Cdr
Squadron-Leader Major J. C. Thomas. Here elaborate obser-
vations were made which reveal the very large numbers
of streptococci that may be contained in blankets and
in wool dust generally, and confirm the increase in
aerosphere contamination that results from bed making
and other disturbances. The old treatment of blankets
is certainly effective in reducing this, and its general
adoption will have to be considered seriously. No one
reading these papers can deny that our whole outlook
in the epidemiology of streptococcal infection has been
changed, and that preventive efforts must take a new
direction. To correlate Hare's findings with recent
statistics in detail, it must be concluded that large droplets
and infection drying on bedclothes and floors are the
principal agency in spreading infection from the air
passages: exudates drying on dressings and persons
probably behave in the same way when the surface
exhibits a wound. Other ways of dealing with the
problem will no doubt be devised, but to us it
seems that the terrible evil in both its forms deserves every effort
to be done.

A sharp outbreak of yellow fever in the Sudan led to the Foundation's supplying a quarter of a million doses of vaccine, and preparations for the supply of at least a million in all. Their researches show that yellow fever is primarily a disease of jungle animals; the virus circulates in the blood of susceptible ones for only three to four days and does not subsequently appear to reinfect. Mosquitoes, however, once infected tend to carry the virus for the remainder of their lives.

After detailing several other activities of the Foundation Dr. Fosdick goes on to an interesting discussion of the sharp attack on science resulting from the growing public realization that its powerful tools can be used for man's enslavement and destruction. Power can be used by evil men to do evil even more than it can be used by men of good will to do good; but, as he says, "Power is one of many things in life, and he quotes Plato: "Power to the effect that the spread of the truth is the only guarantee against whole-sale mendacity by propaganda." The question for the future is how can the social adjustment of human affairs be arranged with less frustration and more justice. The hard fact is that scientific work may not do

There is much food for thought in this report of disappointments of expectations and of fears. One striking fact emerges—the total expenditure for the year on all the beneficent work of the Rockefeller Foundation was roughly 24 million sterling, a trivial sum compared with the cost of the destructive forces at work today.

A WARTIME SURVEY

The wealth of the Rockefeller Foundation flowed from
endowed by the irony of fate its beneficent work is now
seriously curtailed by the struggle for the power that
could can give. This makes Dr. Fosdick's review of the
year's work of the Foundation grim reading. All over
Europe its activities have been brought to a stand-still.
"Even in the shadows that are deepening over that conti-
nent the lights of learning are fading one by one. The
conception of knowledge as an international respon-
sibility has vanished. . . . As German forces have moved
into one country after another a definite pattern has
been followed." Where this was resisted, faculties were
sent to concentration camps and student demonstrations
were broken up with machine guns and tanks." The
tradition of university life and standards on the Conti-
nent is now little short of appalling. Due to flight,
imprisonment, or disappearance the number of professors
has been reduced by at least 50%." The same applies
to the Baltic States absorbed by Russia. Even in neutral
countries scholars are under pressure to follow a
totalitarian interpretation. The German Minister of
Justice gave as his opinion that the old ideal of
objectivity is nonsense: the one question must be, Does
any scientific work serve the welfare of National
Socialism? But, "In all the history of the race know-
ledge has never flowered in a subject people . . . it is
only through free thought that the soul of a people can
be kept alive."

Turning to brighter topics, Dr. Fosdick reports the
success of the campaign against the *Anopheles gambiae*,
the dreaded malaria-carrying insect which was imported
from Africa to Brazil by an airplane or fast French
destroyer plying from Dakar. The virulent outbreak of
malaria which followed is an interesting example of the
fact that epidemics travel at precisely the rate of human
intercourse; formerly at the speed of a horse or sailing
vessel, now at that of a plane. Thanks to the efforts
of Dr. Soper and his staff no evidence of *gambiae* in
Brazil was found in the last forty-seven days of 1940,
though probably certain mopping-up operations remain

THE LESION OF PNEUMOCOCCAL LOBAR PNEUMONIA

The criteria for the experimental production of pneumococcal lobar pneumonia were laid down by Blake and Cecil in 1920.[1] The cocci must be deliberately placed in the lumen of the trachea or of a bronchus in a susceptible animal. Subcutaneous or intravenous injection gives rise to septicaemia with very occasional secondary lung lesions or is without effect; inoculation into the nasal or upper respiratory passages is usually negative. Blake and Cecil suggested that the infection traversed the lung from its hilum as a wave of acute spreading lymphangitis of the interstitial tissue, the cocci travelling in the peribronchial and perivascular lymphatics, the alveoli being invaded from without. On this view the peripheral parts of the lung should always show oedema or early consolidation when the lesion at the hilum shows well-developed lobar consolidation. The conditions laid down by Blake and Cecil have become part and parcel of the experimental study of lobar pneumonia, but their conclusions regarding the evolution of the lesion have been strongly attacked. Loeschcke,[2] in 1931, examined the lungs of forty-seven fatal human cases of lobar pneumonia and claimed to have discovered the primary focus of infection in them all. According to Blake and Cecil this should have been found near the hilum. Loeschcke always found it to be at the periphery, usually in a dorsilateral position. He satisfied himself that the spread of infection was from alveolus to alveolus through the pores of Kohn, that the infective agent was freely flowing oedema fluid in which very large numbers of pneumococci were growing but in which cells were scanty, and that as this fluid increased in volume it was spread by coughing and movement, travelling in the

1 *J. exper. Med.*, 1920, 31, 403, 445; 32, 401, 691, 719.
2 *Beit. z. path. Anat.*, 1931, 86, 201.

small air tubes. Terrell, Robertson, and Coggleshall[3] produced lobar consolidation of the lungs in dogs by introducing pneumococci suspended in a viscous starch emulsion into a terminal bronchus by means of a fine catheter. They found spread to take place radially from the primary focus and the pneumococci to be carried in large numbers in oedema fluid which travelled along the small air tubes. Suspension of the inoculum in a viscid medium protects the pneumococci from phagocytosis, allows them to proliferate locally, and prevents their wide dispersion.

Hamburger and Robertson[4] have recently published an account of experiments which give strong support to the contention that lobar pneumonia spreads from a primary focus in the lung by aspiration into the fine air tubes of pneumococcus-laden oedema fluid. They have taken the matter further, and offer a reasoned explanation, founded on accurate experiments in dogs, of the mechanism of spread of the disease from lobe to lobe and lung to lung. The first problem was to determine the exact anatomical disposition of the main bronchi and their main lobar branches. This was done by making metal casts of the bronchial tree. Primary foci of lobar consolidation were then established at different sites in the lung in a series of animals by injecting pneumococci in 6% starch broth into a terminal bronchus. For each primary site the location and order of appearance of secondary lesions arising from it were determined. For instance, with a primary focus in the right lower lobe the secondary foci appeared in the right middle, right upper, and post-cardiac lobes in this order. Having regard to the fact that the habitual posture of the animals was prone with the head and upper thorax slightly lower than the rest of the body, and by reference to the metal cast, it was demonstrated that the factor deciding where secondary lesions shall appear and in what order is the flow, purely under the influence of gravity, of oedema fluid from the primary focus. It was repeatedly observed in those animals with secondary foci that the primary lesion was much more oedematous than when secondary lesions did not arise. In a word, the spread from lobe to lobe depended in the first place on the degree of acute inflammatory oedema in the primary lesion, and the situation of the secondary lesions in the lung on gravity. This is borne out by further experiments. Cultures from different parts of the lungs were taken from animals with a single lesion and from others with a primary and several secondary lesions. In the first group pneumococci were strictly limited to the primary lesion. In the second, the primary lesion being "wet" and oedematous, there was spread of oedema fluid, and pneumococci were found throughout both lungs. An attempt was then made to induce a secondary focus of pneumonic consolidation in a part of the lung remote from the primary focus by plugging with viscid fluid the fine air tubes to a lobe. This was done by injecting mucoid by a fine catheter introduced through a bronchoscope into the bronchus to a lobe. In a series of nineteen animals no secondary lesion developed in the "plugged" lobe in sixteen. It is therefore reasonable to conclude that the site of a secondary focus is not determined by absence of the normal mechanism for expulsion of fluid from the airways. A series of animals was then infected by injection of the freely flowing watery exudate taken from the air passages of dogs with severe lobar consolidation. Secondary lesions were readily produced by maintaining the animals in positions favouring the flow of fluid to the depths of the lungs, and lesions in various lobes could be obtained at will by varying the position of the animals. When viscid slowly flowing exudate from lesions showing less acute inflammatory oedema was used consolidation did not appear.

[3] *J. clin. Invest.*, 1933, **12**, 595.
[4] *J. exper. Med.*, 1940, **72**, 261, 275

"THE BIRTH OF A BABY"

About eighteen months ago a film entitled "The Birth of a Baby," which had been produced by the American Committee on Maternal Welfare, was sponsored in this country by the National Baby Welfare Council. In some comment in these columns at the time it was remarked that the educative value of the film was undoubtedly high, though it had an opulent American setting which might make it seem rather unreal to the British mother, but that there was nothing in it to shock "even a congregation of churchwardens." Since then it has had to run the gauntlet of the licensing authorities, numbering in some counties twenty or thirty or more, and in others, like London and Middlesex, only one—namely, the county council. A striking difference in the attitude of the authorities to such a film is shown as between the north and the south and west of England. In Lancashire, out of 65 licences required, passes have been given in 58 cases, and refusals in 4, including Warrington and Blackburn. In Yorkshire, out of 55 licences required, passes have been given in 36, and refusals in 6, including Sheffield. In Northumberland and Durham, out of 57 licences required, passes have been given in 41, and refusals in 5 (the refusals include Durham city, where the authorities have declined three times even to see the film). On the other hand, in London, after a preliminary showing at Hammersmith, further licences for cinemas have been refused, and, as showing in town halls and similar buildings is impracticable, a further request is now before the Entertainments Committee. In Middlesex the county council will not permit it anywhere. In Cornwall, where, incidentally, the infant death rate is more than 2% above the average, the county council has refused to see it or pass it. Nevertheless, with many decisions still outstanding, the film has been approved by 77% of the authorities approached and has been seen by about two million people. In Lancashire helpful co-operation is reported from all the 26 boroughs that have passed it, and an excellent response from the public. In spite of anything that Shakespeare may have said, there remains a great amount of importance in a name, and although the film itself contains nothing to offend the susceptibilities of the public, a different title, such as "Safe Motherhood," might not have aroused the squeamishness which has operated against the film in certain quarters.

MILK SUPPLY IN TIME OF WAR

Before the war the total milk production of this country was about 1,500 million gallons per annum. Of this an almost constant amount throughout the year was sold in the liquid milk and cream market. During the summer months a considerable surplus was available for manufacture, and a much smaller surplus during the winter. Roughly equal quantities of milk were used for the production of cheese and of condensed and dried milk, and a quantity equal to these two together for the manufacture of butter. According to Dr. Norman Wright,[1] the Director of the Hannah Dairy Research Institute, who gives these figures, a fall in the total milk production of the country equivalent to 25% of the pre-war figure is to be expected in the near future if the present policy of the Ministry of Agriculture is continued. This will result in a serious shortage of liquid milk during the six winter months, amounting to about 73 million gallons. No surplus for manufacture will be available during the winter, and to make good the winter deficit in liquid milk practically the whole of the summer surplus will have to be used for the manufacture of condensed and dried milk. Only 7%, in fact, will remain for conversion into cheese and butter. It is doubtful whether the existing

[1] "The Milk Supply in Time of War," *J. roy. agric. Soc. England*, 1941, **101**, Pt. ii

lants could deal with the surplus available, and unless, herefore, dried and condensed milks were imported the ountry would have to reduce its milk consumption during ie winter months to an undesirably low level.

Dr. Norman Wright analyses the position and is of the inion that this fall of 25% could and should be avoided xperience during 1914-18, when there was a similar fall, howed that it was due not to the increase of arable at the xpense of grass land, but to the scarcity and high price f feeding stuffs and to a deterioration in the quality of ats and cereals for cattle. Under the present rationing cheme preference is given to dairy cattle in the allocation f feeding stuffs, but though this will ensure an equitable istribution within each priority class, it will not increase he total amount of feeding stuffs available. In the last ear the import of feeding stuffs for animals fell to 40% of he pre-war level, and there is reason to believe that in he present war an even greater fall may occur. The only emedy, therefore, lies in an increased home production of eeding stuffs for cattle. This might be done in two ways. irst, more grass should be grown, particularly for use in pril and August, in order to reduce the consumption of urchased feeding stuffs. Secondly, farmers should be ncouraged to produce silage, using for this purpose herbage n the young leafy stage, when its nutritive value and rotein content are at their highest. It is calculated that f every moderate-sized farm in the country were to produce nly one 35-ton silo of high-quality material, which could e obtained from a single cutting of seven acres of good rassland, the result would be the conservation of three illion tons of silage—an amount sufficient to produce over 0 million gallons of milk, or nearly the whole of the 25% nticipated deficiency. The production of milk constitutes he most economical method of converting feeding stuffs nto animal products, and the maintenance of the milk upply should be the most important objective of wartime usbandry. It is to be hoped, therefore, that the suggesions put forward by Dr. Norman Wright will not only eceive the careful consideration of the Ministry of Agricul-ure, but will, if sound, be translated into practice before t is too late.

CHEMOPROPHYLAXIS OF RHEUMATIC FEVER

We have referred before to the efforts made at two centres n the United States to prevent recurrences of rheumatic ever by prolonged administration of sulphanilamide. As uch as 3 grammes daily has been given even to children or as long as eight months with no apparent ill effects, and heumatic activity seems to have been suppressed while he drug was being taken. A further and more detailed ccount of this study at Baltimore, where it has now been n progress for four years, is given by Caroline B. Thomas, . France, and F. Reichsman.[1] The subjects were out-atients leading ordinary lives, and were allocated to reated and control groups in such a way as to make the wo groups as similar as possible. Two doses each of 1.6 gramme of sulphanilamide were given daily, the first on ising and the second twelve hours later, the resulting oncentration in the blood varying between 1 and 3 mg. er 100 c.cm.; this treatment was begun each year in October and continued until the following June. Very few atients experienced any ill effects; only two patients uring the past two seasons were transferred to the control roup on account of intolerance, although others were also ransferred who failed to take the drug regularly through orgetfulness rather than any objection to its effects. The esults may be stated shortly by saying that during seventy-ine "person-seasons"—a season being the annual period of medication—involving fifty-five patients, there were no major rheumatic attacks, whereas fifteen such attacks occurred during 150 person-seasons in the control group of sixty-seven patients. It was also found by repeated pharyngeal swabbing that haemolytic streptococci were less often to be found in the throats of the treated group or were present in smaller numbers. None of the treated patients died; one control patient died from acute rheumatic fever and two of subacute bacterial endocarditis. Minor rheumatic manifestations were seen in two cases during treatment, and one treated case had a major rheumatic attack in August when medication had been suspended for the summer months. These findings seem to show clearly that rheumatic activity can be suppressed by sulphanilamide treatment and that the small dose which suffices can be taken without discomfort or interference with an ordinary life. It is interesting to speculate on the meaning of this effect with reference to the aetiology of rheumatic fever. It is, of course, possible that some agent other than the haemolytic streptococcus is concerned in producing the disease, and that this second hypothetical micro-organism is also susceptible to sulphanilamide. On the other hand, it is just as reasonable, if not more so, to regard the therapeutic argument as further evidence of the essential part played by haemolytic streptococci themselves. This evidence is only additional to an imposing mass of data accumulating from other directions. The serological studies of Coburn and others have recently[2] been extended with such results as to suggest strongly that streptococcal infection remains active throughout a rheumatic attack, while C. A. Green[3] and others have actually cultivated the organism from affected tissues, notably heart valves. It may well be asked why, if rheumatic fever is an infection by the *Streptococcus pyogenes*, the acute stage should not be amenable to sulphanilamide treatment; it seems to be generally agreed that it is not. This question may perhaps be countered by another: Why is sulphanilamide of so little benefit in scarlet fever? The haemolytic streptococcus is the most versatile organism we know; it has several weapons of attack, and the capacity to produce an astonishing variety of effects, not all dependent on the nature of the tissue affected. It may well be that certain forms of streptococcal activity are less amenable to chemotherapeutic control than others, and if we conclude that rheumatic fever is one of these, the fact of its resistance to chemotherapy may even afford a clue to its more intimate mechanism.

[1] *J. Amer. med. Ass.*, 1941, 116, 551.

[2] *J. clin. Invest.*, 1939, 18, 141.

[3] *J. roy. nav. med. Serv.*, 1939, 25, 218.

Sir Charles Wilson, P.R.C.P., has been appointed Consultant Adviser in Medicine to the Minister of Health for the Emergency Hospital and Medical Services.

We regret to announce the death at the age of 57 of Robert Robison, D.Sc., F.R.S., head of the department of biochemistry at the Lister Institute of Preventive Medicine since 1931, and professor of biochemistry in the University of London. Prof. Robison joined the Lister Institute in 1913, and served with a commission in the R.A.M.C. during the last war. He received the Baly Medal of the Royal College of Physicians of London in 1933 for his distinguished work in physiology.

At the course arranged by the Ling Physical Education Association to take place at Leeds University on Saturday, July 5, Dr. M. Burbury, medical director, Manchester Child Guidance Clinic, will lecture on "Interactions of Mind and Body," and Dr. G. Prince, assistant school medical officer, Leeds, will open a group-discussion on "Co-operation between the School Medical Officer and the Gymnastic Teacher."

CHEST SURGERY IN WAR

This is one of a short series of articles based on lectures given at the British Postgraduate Medical School, Hammersmith

CLOSED WOUNDS OF THE CHEST, AND THE PHYSICIAN'S PLACE IN A CHEST TEAM

BY

J. A. NIXON, C.M.G., M.D., F.R.C.P.

Changes in climate, the nature of the soil, the character of weapons and missiles, render the aspect of gunshot wounds of the chest exceedingly variable. In the South African War it was decided that chest wounds were best left to the natural processes of cure. In the war of 1914-18 sepsis was so frequent in all varieties of chest wound that by 1916 Duval of the French Army and Gask of the British Army first began to apply the general rules of surgery to lung wounds. In July, 1917, a meeting of consulting surgeons and physicians drew up a memorandum which was communicated as a guide to all medical units.

A Guide for Medical Units

Briefly the following rules were laid down:

1. An open pneumothorax should be temporarily closed by suture at the earliest opportunity, either at the field ambulance or C.C.S. If suturing is impossible the wound should be packed and strapped to render it airtight.

2. Extensive parietal wounds, including the above, should be treated as any other large wound, and comminuted rib fragments removed.

3. A large foreign body shown by radiographs to be accessible should be removed, haemothorax evacuated, and the chest closed. Bullets or small fragments may be left.

4. Any large haemothorax attended by persistent respiratory distress should be aspirated; this is best done after a lapse of forty-eight hours.

5. Gross infections may be treated by rib resection and drainage. Mild infection may be closed after thorough cleansing of the pleural cavity.

6. Set operations should not be performed until initial collapse has passed off.

7. Always close a wound of the diaphragm discovered at a thoracotomy.

8. Any case subjected to open thoracotomy must be retained for ten days after operation.

9. Reliable *x*-ray plant and immediate access to a pathological laboratory are essential to successful chest surgery.

These rules made a great change in the number of cases left to expectant treatment. Gask estimated that perhaps 25% of cases needed surgical treatment in the first twenty-four hours; even through-and-through rifle-bullet wounds often become septic. Captain Mann of No. 3 Canadian C.C.S. (with whom I worked for a short time in 1917) noted that septic empyemata were not more common with retained missiles than with through-and-through wounds, and that fragments of high-explosive missiles showed only a slighter tendency to become septic than did rifle bullets. Of cases with retained foreign bodies (10% bullet, 90% shell) 16% developed septic haemothorax at the C.C.S. (11% bullet, 89% shell). Of cases without retained foreign bodies (39.5% bullet, 60.5% shell) 21% developed septic haemothorax (20% bullet, 80% shell). The determining factor seemed to be the character of the wound rather than the nature of the missile. Injuries to ribs and laceration of soft parts were mainly responsible for the production of sepsis.

So it came about that the proportion of cases that would from choice (not military necessity) be left to expectant treatment was small. The idea that "closed wounds" as a whole class do not need surgery is dangerous. This is especially true of "stove-in chests" with several ribs smashed and driven in without any penetrating wound. These are veritable "closed wounds," but it was universally agreed that they required immediate operation.

During the summer of 1917 Major Lockwood (of Toronto) and I had the good fortune to be so stationed at Zuydcoote, near Dunkirk, that we received our chest cases direct from the line. They came to us at No. 36 C.C.S. without stopping at a field ambulance. The Passchendaele battle did not affect us, except that no ambulance trains could be spared to take our cases to the base, so we kept our patients through to convalescence. In parenthesis I may remark that we shared the vast sanatorium at Zuydcoote with the French Mobile Surgical Unit 21, of which Prof. Duval was the chief surgeon. We worked there from August to November, 1917. The total number of "G.S.W. chest" admitted was 168; operations were performed on 82, and non-operated cases amounted to 86. Of the non-operated cases 9 were brought in dead, 21 died within a few hours of admission, yet 55 survived. It appears that we refrained deliberately from operation in only 56 cases. As I look through the fatal non-operated cases I think No. 48 is the only one upon which we decided of free choice not to operate. The results of this group of cases turned the scale in favour of early operation rather than early evacuation to the base.

I have one other set of figures of Lockwood's and mine. In September, 1916, 203 cases were admitted to a special chest ward at Heilly. Of these only 16 died in the C.C.S., but this low death rate is partly explained by the fact that abdomino-thoracic injuries were taken into surgical wards and classified separately. I do not know what was the after-history of the 187 cases evacuated to the base; but of the 168 cases at Zuydcoote 113 lived and were discharged by us convalescent. Lockwood noted in his paper that the figures showed a high percentage of recoveries in cases that previously showed a mortality of nearly 100%.

I lay stress on this experience because it shows how few cases a physician will choose to treat expectantly. Perhaps the prophylactic use of sulphanilamide may justify a change in practice.

Classification of Cases

It comes to this, then: there were very few "G.S.W. chest" that, in the climate and soil conditions of France and Flanders, a physician would choose for expectant treatment. But circumstances may compel expectant treatment—for example, the absence of surgical facilities or, even with these facilities, the absence of radiographic facilities; or the patient may be unfit for operation owing to the severity of the intrathoracic injuries, the severity of external or complicating wounds, loss of blood, or collapse or shock due to cold or transport. Allowing, however, for such considerations, there remain two classes of "closed wound" which the physician may be allowed to look after: (1) the cases in which no operation has been deemed necessary and the patient's condition is good; (2) the cases

a which operation has been performed and in which the eon has closed the chest. No physician without rience of war surgery of chest wounds is competent to t cases for Group 1.

Early Aspiration

he whole plan of treatment of closed wounds may be marized in a short sentence: No fluid, whether blood, m, or pus, must be allowed to collect in the chest ly and frequent aspiration must be resorted to whether acotomy has been performed or not.

s a rule it is injudicious to aspirate for either pneumo- ax or haemothorax immediately after the wounding. sionally it is obvious from the urgency of the dys- ea that relief might be obtained by immediate aspira- . Sometimes this becomes evident after resuscitation been tried without success or with only partial success. patient recovers partially from his shock and, as he vers, dyspnoea, which is often absent while the respira- s are feeble and shallow, begins to show itself. It is ortant to recognize that urgent dyspnoea with cyanosis t after wounding is more pronounced in cases of exten- collapse or deflation of the lung without much mothorax or pneumothorax than in cases in which the er conditions are unaccompanied by collapse of the tively uninjured lungs. A useful point in diagnosis is t haemothorax or pneumothorax pushes the heart away, reas collapsed lung pulls it.

he post-operative aspiration of a chest must conform the one rule that no fluid must be allowed to collect in pleural cavity. Looking back at Lockwood's cases I l it was the rule that a chest closed at operation was lored eighteen hours later. Exploration was usually eated several times. Cultures were made, but the dis- ery of pyogenic organisms or pus did not mean that chest was reopened and drained. We always tried eated aspiration. Lockwood's comment on this point s: "The rapid recovery by aspiration from an empyema cted by aerobes and anaerobes demonstrates that eated aspiration should be resorted to before con- ering resection and drainage. The mortality of the er-operation in chest wounds at C.C.S. is nearly 50%." kwood's rules should be adhered to.

"Chest cases should be nursed in the open air if possible Aspiration is carried out as a routine eighteen hours after peration and at the end of the third day. Exploration of he chest is performed at frequent intervals whenever an ccumulation of even small quantities of fluid is suspected. uid fluid, if found, is removed by aspiration. Fluid must ot be allowed to collect after operation. Physical signs are misleading, and nothing but repeated use of the exploring yringe and aspirator, aided by x-ray examination, will keep a chest safely emptied of fluid. Non-operated cases should be treated precisely as post-operative cases."

It is noteworthy that open drainage did not come into s scheme.

We did not recognize in the war of 1914-18 a separate ass of "blast injuries" of the lung such as has been scribed amongst the air-raid casualties of the present ar, and I have not seen enough examples to express any inion about such injuries. It must be realized that the ctims of air raids reach hospital alive with injuries to ich a soldier succumbs on the battlefield, and we know at 50% of all chest wounds resulted in death on the attlefield in the last war. *No one knows whether* "blast juries" contributed to these deaths.

The Physician's Place in a Chest Team

Now I want to say something about the physician's place a chest team, because there is always a definite place r a physician. One of his first duties is to decide as to e intrathoracic injuries in the following way: Is there a sufficient degree of pneumothorax, haemothorax, collapse of lung, laceration or haematoma of lung, injury to heart, pericardium, or great vessels, injury to diaphragm and abdominal viscera, or injury to vertebrae or spinal cord to account for the severity of the symptoms?

Radioscopy and radiography are indispensable in order to reach a correct conclusion on these points. If the patient is unfit to undergo immediate x-ray examination the decision is easier. He is unfit for any immediate operation save one of the following: immediate and rapid operation for the arrest of visible haemorrhage from the chest wall or thorax; arrest of haemorrhage from coexisting wounds, aspiration for relief of pneumothorax (usually valve pneumothorax); aspiration for relief of haemothorax, temporary closure of open pneumothorax.

Duval pointed out the immense value of blood-pressure observations in the differentiation of shock from haemorrhage. The patient must be kept warm and every half-hour the blood pressure be gauged by the sphygmomanometer. In cases of pulmonary haemorrhage great care must be taken not to lower the head and not to administer subcutaneous or intravenous injections. If the blood pressure progressively falls operation is indicated, as haemorrhage is outweighing shock. It must be realized that a patient with a simple through-and-through wound or one with a small missile retained should not be profoundly collapsed or in great respiratory distress after being kept warm and at rest for an hour or two. If at the end of this time the condition has not improved the following possible causes must be considered in addition to the intrathoracic lesions just mentioned: haemorrhage, severe parietal and external thoracic injuries, diaphragmatic and abdominal injuries, and multiple wounds other than abdomino-thoracic.

Haemorrhage

This may have been very large in amount, and there may still be active bleeding As a rule with closed thorax the amount of intrathoracic haemorrhage will not of itself be enough to produce severe shock. When there is an "open thorax" the estimated size of the haemothorax is no guide to the quantity of blood lost, as the greater part of the bleeding may have been external. In such a case physical examination is of little assistance beyond determining that there is an "open thorax" and that the patient is suffering from loss of blood. If the missile has been retained it is of the greatest importance to locate it accurately by radiographs. Signs of increasing effusion after twenty-four to thirty-six hours are scarcely ever due to active haemorrhage. Lockwood and I saw only 5 cases of recurrent haemorrhage.

Severe Parietal and External Thoracic Injuries

Comminuted fractures of ribs, scapula, or sternum produce the gravest symptoms even in the absence of severe intrathoracic injuries. It is of the utmost importance in such cases to determine the extent of the intrathoracic or pulmonary injury. Physical examination by auscultation and percussion is difficult to perform and more difficult to interpret. It will give little information beyond establishing the presence or absence of haemothorax or pneumothorax. But it is essential for the surgeon to know beforehand whether his operation should be limited to the parietes or should extend to the interior of the thorax. As a general rule, if the entrance wound is small and clean and there is no comminution of bone, whilst the extensive bony injury is confined to the exit wound, there will be no in-driven fragments, and the operation may be limited to the parietes. But if the entrance wound is large, if there are in-driven fragments of bone or pieces of clothing, and especially if a large missile is retained, the operation must extend to the interior of the chest.

Associated Injuries

Careful attention has always to be paid to injuries other than purely thoracic which may have been caused by the missile or missiles which have struck the chest, particularly injuries of the diaphragm and abdominal viscera. A prompt decision must be made as to whether there is sufficient thoracic injury to produce the symptoms or whether the thoracic injury may be ignored and a further explanation be looked for below the diaphragm. To the surgeon a definite and reliable opinion expressed by the physician that the intrathoracic injury is negligible is of great assistance. In order to form a definite opinion in such a case, physical examination of the chest becomes more important than in the class of case previously considered. If the heart is not displaced; if there is no great degree of surgical emphysema; if there is no large amount of air or fluid in the chest; but, above all, if there is a fair degree of air entry into the lungs, it may be assumed that, although the missile has entered the chest, the grave lesion exists elsewhere. In a through-and-through wound the track of the missile may make it obvious that no important structure has intervened; failing this, radiographs will be required unless the presence of an abdominal injury is made clear by other signs and symptoms. Abdominal rigidity and immobility are not by themselves clear indications of abdominal injury; these signs are often present in pure chest injuries. Increased dullness in the spleen area, haematuria, the presence of dullness in the flanks, localized tenderness and pain in the abdomen, the peculiar "catchy" breathing suggestive of diaphragmatic injury, and hiccup are signs that should be noted and interpreted as indicating injuries below the diaphragm.

Spinal Injuries and Multiple Wounds

Spinal injuries demand recognition, and not merely those which involve the actual spinal cord. Injuries to the body or processes of vertebrae may cause the gravest symptoms and present very puzzling features. Excessive pain, radiating very irregularly, is constantly met with in injuries of the vertebral bodies, and resembles the intense and erratic pain due to erosion of the vertebrae by aneurysm. Profound collapse which resists all efforts at resuscitation is often seen in spinal injuries, even when the cord is undamaged.

Apart from the associated injuries which the missile entering the chest may have produced, there may be other wounds that make it difficult to decide whether the patient's serious condition is attributable mainly to the chest wound or not. Here, again, if there is fair air entry into the lungs, the intrathoracic injury may be put on one side. A patient with one lung expanding well should not be greatly distressed even though the other lung is completely out of action, provided some hours have elapsed to allow him to adjust himself to his new conditions, and provided he has been kept at rest.

Mr. Thomas Johnston, M.P., Secretary of State for Scotland, has urged Scottish local authorities to improve their schemes for the relief of people rendered homeless by enemy attack. In a memorandum issued by the Department of Health for Scotland the authorities are instructed to make certain that their plans will actually work even in the severest conditions. The rest centre and billeting organization in each area ought to be so efficient that the local authority will be able to deal with its own homeless no matter how severe the raid may be. The Secretary of State is convinced that while much preparatory work has been done by local authorities the relief scheme can be still further improved He attaches the greatest importance to the testing of emergency relief organizations, and urges every local authority to arrange rehearsals on as large a scale as possible.

MEDICAL PLANNING RESEARCH

MANIFESTO BY THE "YOUNGER HALF"

The following letter, signed by forty-eight members of the me profession, has been received for publication.

SIR,—The nature of the war has made it clear that a siderable degree of peacetime reconstruction of all kinds be inevitable, and the Government have already recognized by the appointment of a Cabinet Minister to inquire into s of its aspects. Medicine will unquestionably be affected, we feel that serious consideration should be given now t future needs. There are many signs that the younger doc in the country appreciate this, and it is our aim to collect co-ordinate their thoughts so that they can be, clearly st at the proper time. We are aware that the B.M.A. have se a Planning Commission, and other bodies have set up c mittees with similar purpose, but we feel that there nee no conflict. While we wish to emphasize the views of younger half of the profession, we also hope to enlist sympathy of many of our seniors, and will welcome t support and criticism.

Three Guiding Principles

We therefore invite all who agree with our guiding princ to join us. Our principles are three:

1. In assessing the past, and in planning the future, will proceed by scientific methods. We will collect all a able evidence, we will believe according to the evidence, we will admit ourselves wrong whenever we are shown t so by the evidence. So far as is humanly possible, we examine all proposals (and the evidence on which they based) without prejudice. We will give to tradition custom their due weight, but not more than their due wei and we will not disregard a thing merely because it is nor regard a thing merely because it is new. By so d we hope to avoid unseemly squabbling and makeshift c promise, and at the same time achieve a high degre unanimity.

2. We regard committees, congresses, and meetings valuable for exchanging ideas, but of much less value scientific research, executive work, or practical planning. decision is reinforced by the practical difficulties of graphy and transport, which make such meetings impos at the present time. Our proposed plan of campaign, lined below, enables all who care to do so, including doc serving in the Forces at home or abroad, to express t considered views, and the reasons behind their views.

3. The first consideration of all planning and propc must be the maximum benefit of the maximum numbe patients. The second consideration must be the condit of work of those who serve the patients (doctors, nu lay administrators, almoners, technicians, etc.). Where t two clash, the first must have precedence. But, unless t are considered, the first will be nullified.

Since we wish to press our claims on their merits as object scientific, and practical proposals rather than as having backing of so many thousands of supporters, we invite those who are prepared to co-operate *actively* to join in research. Co-operation can take either or both of two fo We give below a list of subjects which we propose to consi Any member may choose one or more of these subjects prepare a draft report (giving a summary of the present si tion, together with his proposals for the future). The t allowed for this preliminary drafting will be three mon It is hoped to have at least three *drafting members* reporting each subject, and on the major subjects considerably m When the drafts on each subject have been received, they be collated, and a single "preliminary" report prepared. work of collating will be carried out by an editorial gr composed of the signatories of this letter and any who volunteer to join them. Each of these preliminary rep will be submitted to *all* members for comment and critici The criticisms and comments will be studied, and wherever t are an improvement on the preliminary reports they will embodied. Thus a series of final reports will be prepared, we hope to issue these as a book. When this stage is reac our task will be ended.

Ordinary or critical membership is open to all. is intended that in most cases drafting membership be for any doctor or dentist who has been quali less than twenty-one years, or for any final-year medi student, nurse, lay administrator, almoner, dispenser, h pital technician, or other person interested in or c nected with our health services who is not over 45 ye

age. The membership fee in either case is 10s. 6d. This is essary to cover clerical costs and postage, further, we believe at those who have something worth saying will think it worth le to pay 10s. 6d. to say it, and that those who have t will not. Prospective members should send their subscrips to Dr. Kenneth Perry the Connaught Hospital, Walmstow, London, E 17. Critical members must bear in mind at they can anticipate nothing beyond a receipt for at least months only then will the first preliminary reports be ady. All members should keep Dr Perry informed of anges of address.

Drafting members should name their subject or subjects at e time of paying their subscriptions. They will then receive neral matching orders and suggestions—which, of course ey will be fully at liberty to disregard. In general we will k them to pursue the scientific method of collecting evidence d basing their conclusions upon it. In this connexion we ve recommend the P E P report of 1937, or in shorter form e summary by S. Mervyn Herbert, *Britain's Health* (Pelican 4).

The subdivisions of our problem which we propose and from ich we invite our drafting members to take their pick are as follows:

General Problems

The Medical Needs of the Population.—The post-war population—the distribution of the population—the population's needs in terms of doctors (general practitioners, consultants specialists, research workers, public health workers); dentists, nurses, almoners and social workers, clinics, hospital beds, environmental services, nutritional services.

The Capacity of the Population to Pay for its Needs.—The national income—the proportion spent on the health services—how it is collected—how it is spent—the individual capacity to pay. The proportions of the population in different income groups. Family budgets.

How should the Population Pay?—The patient's point of view: cash payment, insurance, rates, taxes. The doctor's point of view, fees, capitation fees, salaries for G.P.s, consultants and specialists, hospital staff, public health workers. Grading of patients on capacity to pay.

How should the Population be Served?—General practitioners—free choice of doctor—clinics—health centres—small hospitals—large hospitals—hospital groups.

How should the Services be Distributed?—Chance—tradition—planning—local authorities—regional authorities.

Administration.—The need for individual autonomy—the need for local autonomy—team work—the firm in general practice—the firm in hospital—medical and lay administrators. Committees: advisory and executive—small and large, medical and lay. Authorities: local, regional, national. Forms and red tape.

Special Problems

The Hospital Services.—Regionalization—unification of control—unification of finance—regional hospital authorities—local hospital authorities—size of hospitals—nursing homes—dispensaries—hospital groups—town or country hospitals—design of hospitals—preservation of traditional features (names of hospitals wards, etc.)—special hospitals, as part of hospital groups, as national specialist centres of teaching and research—out-patient services—appointments for out-patients—clinics—emergency services—the non-urgent patient; waiting lists—attendance services—medical superintendent or firms and units—resident medical officers and resident surgical officers—medical or lay administrators—hospital committees, lay, medical—internal administration of hospitals—consultant and specialist services, in hospital, in the home; "consultoids," "Harley Street"—the "private patient"—medical staff, part-time, honorary—resident medical staff—continuity of treatment—hospital records—clerical assistance for medical staff.

The Specialist Services.—The apportioning of beds according to the needs of the patients—need for flexibility within hospital services according to changing needs of the population—general medicine—general physicians or special physicians—diseases of the chest—tuberculosis services: tuberculosis officers; sanatoria; Papworth; the employment of the tuberculous in sanatoria—cardiology; cardiac invalidism—gastro-enterology—biochemical medicine—neuropsychiatric services, neurology, psychiatry, psychotherapy, occupational therapy, child psychiatry and child guidance, institutional treatment, neuropsychiatric clinics, mental hospitals, institutions for defectives, epileptic colonies, prisons and criminal psychopathic hospitals, the case for a combined service with periods of work in each type of institution, the psychopath at large—arthritic services, physiotherapy, hydrotherapy, spas—fever services—paediatric services—school medical services—venereal services—dermatological services—tropical diseases—convalescence—rehabilitation—the chronic sick—general surgery—general surgeons or special surgeons—anaesthesia—*cancer service*—traumatic surgery, fracture services—burns—orthopaedics—care of the crippled and permanently incapacitated—plastic surgery—massage and physiotherapy—pulmonary surgery—cardiac surgery—abdominal surgery—genito-urinary surgery—cranial surgery—ear, nose, and throat surgery; tonsils and adenoids; the deaf and dumb—ophthalmology; spectacles; opticians; the blind—gynaecology—midwifery; institutional; domiciliary; the midwife—maternity and child welfare services—abortion—birth control—sterilization—euthanasia—eugenics—radiology, who should interpret x rays?—radiotherapy, radium, radiographers—pathology, bacteriology, biochemistry, clinical pathology, laboratory technicians, transfusion services—dentistry, as a part of a national health service, internal problems—pharmaceutics dispensers cash chemists, manufacturing chemists, patent medicines.

Medical Education.—The supply of students—cost of medical training—pre-clinical studies—clinical studies—social studies—environmental studies—apprenticeship in practice—examinations, multiplicity bookishness, cramming—postgraduate training—refresher courses—foreign travel—mixed and unisexual medical schools—university hospitals—research—the film in medical education.

General Practice.—Single-handed or firm—the locum—the assistant—sale of practices—pensions for G.P.s—scope of general practice—need for consultants—pathology in general practice—G.P. specialists—G.P.s and hospitals—the panel and its extension—number of patients per doctor—certificates—dispensing—the panel from the patient's point of view; sickness benefit additional benefits, approved societies—contract practice—clubs—workmen's compensation—domestic help for the sick—should the G.P.s run the clinics?—co-ordination of G.P.s panel committees, regional medical officers—special war problems, shelter doctors, evacuees.

The Environmental Health Services.—Local authorities or regional authorities—duties of the M.O.H.—size of M.O.H.'s area—sanitation rural problems; water supply; refuse disposal—food, protection, nutrition, school meals—epidemiology—vital statistics—port health authorities—industrial medicine—hours of work—holidays—unemployment and health—health education—physical education—medico-legal services, coroners, medical witnesses medical assessors, need for an institute of forensic medicine.

Medicine and the Defence Services.—R.N. Medical Service—R.A.M.C.—R.A.F. Medical Service—Ministry of Pensions Medical Service—I.M.S.—Colonial medical services—Merchant Naval medical services—the case for a combined service with periodical work in each.

The Nursing Services.—Recruitment—training—payment—pensions—domiciliary nursing, the district nurse, the private nurse—*health visitors*—*specialized nursing, fevers, tuberculosis,* the chronic sick, mental nursing, midwives, industrial nurses—seasonal features of nursing, need for a pool of nurses—the male nurse.

The Almoner and Social Services.—Recruitment—training—payment—pensions—scope of work—specialized social work, mental health, family visiting, social research.

Miscellaneous Problems.—The Emergency Medical Service—the State's liability in war—ancillary medical services: opticians; masseurs; chiropodists; laboratory technicians, etc.—special problems of medical research, "pure" research, clinical research, social research, attempts to combine teaching, administration, and research—health services in other countries—medical missions—Highlands and Islands medical service—Gloucestershire medical services—Nuffield Provincial Hospitals Trust—Pioneer Health Centre, Peckham.

The list is a formidable one. With its fifteen main headings and some 320 subject headings, we hope that it is fairly comprehensive. Experience may show that it needs revision, and we are ready to admit errors of omission or commission. There has inevitably been a small amount of overlapping, where the same matter requires consideration from more than one aspect. The list illustrates the size and complexity of the problems which have to be studied; as a corollary it illustrates how essential it is that planning for the future should be done as a large-scale co-operative research rather than as a series of isolated efforts.

It is, of course, open to a drafting member to choose a main heading, or several subject headings. Even if each drafting member undertakes a wide subject or range of subjects, we shall need a large number of such members. If any drafting members also wish to undertake the work of assessing, collating,

and subediting reports, they should indicate this when writing to Dr. Perry.

The signatories of this letter were recruited solely by personal contact. They make no claims to represent the whole profession, and, while they are drawn from as wide a circle as has been possible, there are necessarily many gaps to be filled. They profess no sectional interests.

We are, Sir,

Sidney Abrahams	L. A. Hawkins	Kenneth M. A. Perry
Stanley Alcock	W. H. Hayes	G. White Phillips
Stanley Alstead	Alastair Hunter	Hugh Ramsay
G. O. Barber	Donald Hunter	A. H. T. Robb-Smith
R. H. R. Belsey	Margaret N. Jackson	Alan F. Shirras
Frank Bodman	V. M. S. King	A. H. M. Siddons
R. E. Bonham-Carter	W. N. Leak	Charity Taylor
E. J. R. Burrough	C. G. Learoyd	Stephen Taylor
W. I. Card	A. David Le Vay	W. A. R. Thomson
George Day	Duncan G. Leys	Doris M. Thornton
Richard H. Dobbs	A. Macdonald	R. E. Tunbridge
S. C. Dyke	H. H. MacWilliam	J. Michael Vaizey
J. A. Fathi	D. McGavin	H. J. Voss
A. F. Foster-Carter	Andrew Morland	Philip Wiles
A. S. Hall	Gerald Parsons-Smith	Clifford Wilson
J. R. G. Harris	J. E. G. Pearson	Henry Wilson

FIRST AID IN AIR RAIDS

EXPERIENCES OF BRISTOL PRACTITIONERS

A very largely attended meeting of the Bristol Division of the British Medical Association was held at the University on June 12, when there was a symposium on "Experiences of First Aid in Air Raids." Dr. J. A. NIXON, chairman of the Division, presided.

Mobile Units

Dr. H. M. GOLDING said that when the sirens first howled in Bristol last year and were followed by bomb explosions the doctors at his post collected with commendable rapidity and presently came back with exciting stories. It was commonplace enough now, though to the speaker the most fearsome part was still the drive alone from home to the post in the middle of a "blitz." In Bristol it had been the policy to place first-aid posts at established clinics or hospitals, thereby ensuring a fully equipped staff. Although he was on the mobile unit he had had a good deal of experience of post work, waiting up all night for casualties which never came, and on other occasions having the post full to overflowing. Shock had been encountered in all its forms, and they had learned that its degree did not depend on the severity of the injury. A patient with a scratch might be profoundly shocked; on the other hand, a man who had been trapped under falling debris was brought in with ruptured patella and forward dislocation of the knee-joint and showed practically no shock at all, although to his injury was added uncertainty as to the fate of his family. On the human side a great deal had been learned. Patients were no longer asked to go home before it had been ascertained that there was a home for them to go to.

The mobile unit was a van fully equipped to set up an emergency first-aid post near the scene of severe "incidents." Unfortunately it had not worked quite so easily. Either there was no suitable accommodation just where it was needed or the building chosen was not blacked out or the black-out had been blasted away. The mobile unit, sent out on orders from the report centre, was manned by a doctor, a trained sister, five auxiliary nurses, and a driver. His own unit had belied its name by remaining completely immobile for many months. The first "incident" attended was a quarter of a mile from any suitable building in which the post could be set up, and the casualties had been collected in a large surface shelter. The casualties varied from a sprained ankle to a depressed fracture of the skull, and they had to be treated under most difficult conditions. It was a great relief to see them taken away in the ambulance.

"In the prevention of shock immediately after injury one was told to ensure freedom from worry, and I had an interesting lesson about that. A woman was completely buried in debris. When her head and shoulders were exposed she cried, 'I have lost my handbag.' A man who was standing by said, 'It's all right, missis, the policeman's got it.' Actually the handbag was not dug out of the ruins until some four later, but the woman had been most effectively treated shock."

Dr. Golding concluded with a special tribute to the si and nurses of his unit, who had turned out in the hazardous conditions without hesitation, and to the p ambulance, and rescue parties, the co-operation between w had been all that could be desired.

Control of the Air-raid Services

Dr. A. M. FRASER (Assistant M.O.H., Bristol) said tha experience had been in the control, where it was his bus to help the divisional report centres in the operation o casualty services. These centres controlled the ambul first-aid, and rescue parties for the division, which also at least one first-aid post, one mobile unit, a bliste cleansing station, and an emergency mortuary. All were co-ordinated by the officer in charge. Reports from wardens were passed to the central control, which was to supply more help where it was needed. The chief of reinforcements from outside was not during the first night, but on the following night should the attack repeated. A second important job was to keep in touch the hospitals. If the control discovered that one hospital receiving a heavy load while others were not rece casualties, instructions were sent to the report centre deflect ambulances accordingly to places where surgeons beds were waiting.

Dr. M. E. J. PACKER said that he had had the privile turning out for every raid, and had learned useful lesso each. On the first occasion, when a factory was "blitz the first-aid unit was called out rather late, and by the it arrived most of the casualties had been cleared away. described certain experiences which showed how necessa was for the doctor attending an "incident" to have e gency equipment with him. He now adopted the pla having a ready-packed bag to be taken wherever nee Any unwanted first-aid vans and personnel should be cle as quickly as possible from the vicinity of an "incide where another explosion might very well occur, disastrous effects. One of the disadvantages of distribu patients in near-by houses in the care of nurses where might receive dressings and injections was that these h were very likely to be deprived of light, and he thoug was important to provide facilities for the antitetanic s injections to be given in the van itself to obviate unneces journeys to the first-aid post. Afterwards, instead of ta the rather cumbersome van to the different points, he le as a kind of headquarters at the main crater and himself round with nurses in a small private car, which turned easily. Dr. Packer mentioned also the greater safet wriggling through narrow holes rather than large, becaus overhanging debris was not so likely to collapse; also danger of the steel helmet knocking against a lot of stuff and precipitating a fall. The doctor should be ac panied by several nurses, who might be left at different po and thus he and they could keep in touch with all "incidents" at the same time.

The Casualty Doctor's Equipment

Dr. J. MORTON EVANS, jun., said that his main diffic in charge of a mobile unit was in getting from the post t casualty. He took three things in his pocket—a torc hypodermic outfit in a spirit case, and a rubber-capped b filled with a solution of morphine, 1/2 gr. per c.cm. It impossible to get sterile water at the scene of an "incide but even in the dark one could push the hypodermic n through the cap and fill the syringe. To give some ou protection to clothes when crawling over debris he custom wore a muffler, an overcoat, an old pair of golf trousers, gauntlet gloves. Of 250 casualties he had attended just one-half had been eye injuries or burns. Many of these firemen who, if not actually burned, had smoke in t eyes to such an extent that for a time they were comple blinded. Washing their eyes out and putting in li paraffin gave them great relief. Of the rest, 7.5% of casualties were burns to the hands or limbs; 10% injuries, 27% wounds of the limbs, 1.5% wounds of trunk, and 3% shock or blast injuries. Of this nur probably 10% were sent to hospital.

r. R. J. STEPHEN spoke also of the large number of burns ting the eyes. He had felt the need for some anaesthetic tion for treating damaged eyes. The usual procedure was sh with an alkaline solution and put in liquid paraffin of the difficulties in treating casualties on the spot was mitting oil of water and electric supplies. Spare water was d in the first-aid van, but it soon became a bowl of mud

r. W. H. HAVES said that he was not attached to the al organization, but had gone to "incidents" near him ped that the scheme for calling upon doctors nearest to ccurrence would soon be completed so that they would alled out instead of going out on their own. On the tion of administration of morphine, it was useless idling about" with ampoules. He thought doctors should upplied with something similar to army field dressings h could be put straight on and bandaged round

r. H. D. PYKE said that there were occasions when he that he had done nothing beyond giving moral support. were he a victim he would like to feel that there was a or handy and that he had equipment ready for use

r. I. G. DAVIES (Deputy M.O.H., Bristol) said that rience had shown that the doctor must be completely ile, with possibly a nurse, and very light emergency ipment. Nobody appeared to have predicted that alties would have to be dug out of buildings amid mbable dirt and dust. First-aid and rescue parties had arn how to dig people out of wreckage without adding to r injuries.

r. N. S. B. VISTER said that in his district outside Bristol ster of doctors had been drawn up for call as needed presence of a doctor was of great help to the first-aid y.

Mobile Units

lonel E. T. POTTS (Ministry of Health) said that mobile s were originally intended for work in rural areas, not in n, but experience had shown that they could be of great e in urban localities. It was useless to call them out, ever, to small "incidents" of three or four casualties ssible to have a roster of doctors who would be ared to go to "incidents" scattered over a considerable so that there would always be medical help available never the need arose. A scheme of that character had been loped in South Wales and in other places whereby a ce summoned the doctor direct and advised the control he had done so. Morphine was originally issued in the of tablets, but the difficulty of dissolving the tablets in dark had been brought to the Ministry's attention, and d now been arranged that first-aid posts and mobile units ld be issued with morphine in solution in rubber-capped les. Among the casualties the large proportion of injuries and and face was noticeable all over the country; next e wounds of the upper extremity, followed by wounds he lower. Burns had increased appreciably since the wide- use of incendiary bombs. Cases of shock were decreas- notwithstanding the greater intensity of air raids.

r. TREVOR JONES (Cardiff) said that Cardiff had taken all ors in active practice who were willing to do the work had attached them to wardens' posts. The doctors were e who lived near the posts and knew the wardens person- When an "incident" occurred the wardens sent diately for the doctors, who were equipped with a bag aining the requisites mentioned, most notably morphine tion and a syringe. Control was notified directly the tor was called out, and thus knew where each doctor was. re were not enough doctors to go round, and sometimes a tor was attached to more than one wardens' post. Senior ical students were also available.

Before this very successful meeting ended it was agreed to d on July 10 a similar symposium on the casualty services r-aid victims in hospitals.

As a result of representations made by the British Hospitals sociation, and pending the conclusion also of definitive rangements, supplies of rationed goods to voluntary hos- ls and other hospitals not covered by existing arrange- nts may be made by traders without coupons against a ipt of the same type as that provided in the case of supplies local authorities.

CENTRES FOR TREATMENT OF FRACTURES

Further centres for the treatment of fractures are to be set up under the Emergency Hospital Scheme in addition to the twenty special Orthopaedic Centres already established. The latter are not able to deal with all types of fracture cases as well as the special orthopaedic cases for which they were designed; and, with the extension of fracture treatment under the Scheme to industrial workers and members of the Civil Defence Services, it has become necessary to arrange facilities at a large number of additional hospitals. The new centres will be grouped as follows:

(1) Fracture Departments "A" in hospitals suitable from their situation for cases requiring treatment over a long period. These departments, which will normally be able to accommodate 100 to 150 patients, will be under the direction of a surgeon experienced in the treatment of fractures, will provide for proper segregation of cases, and will have facilities for massage, electrotherapy, remedial exercises, and occupational therapy.

(2) Fracture Departments "B" in hospitals with the necessary medical staff, experience, and equipment for the treatment of fractures but suitable only for ambulant cases and those not requiring more than about a week's in-patient treatment.

(3) Fracture Clinics "C" within reach of the patient's home for out-patient treatment after discharge from hospital. *Arrangements are being made to recognize certain clinics for this purpose*, and as soon as these are settled details will be sent to hospital authorities

This information is given in a Ministry of Health circular (No. 2395) which has been sent to local and hospital authorities and in some instances to medical officers of health and is accompanied by a list of the Orthopaedic Centres and the hospitals which have been selected as Fracture Departments A and B. Instructions are being issued as to the types of cases which should be transferred to Orthopaedic Centres and to the various fracture departments and, for the benefit of the latter, information concerning personnel, accommodation, and equipment.

INTER RELATION OF MAN AND FUNGUS IN HEALTH AND DISEASE

A Chadwick Lecture on this subject was given on June 19 at the Chelsea Physic Garden, S.W., by Mr. J. Ramsbottom, D.Sc., with Sir William J. Collins, M.D., in the chair. The lecturer began by recalling that the outstanding characteristic of fungi was that they had no green colouring matter—chlorophyll—and were unable to form their own carbohydrates from the carbon dioxide of the air and water as did green plants. They must therefore have organic food already elaborated and thus must live a parasitic or a saprophytic existence. Apart from the use of some of the larger fungi as food and the poisonous properties of a few of them there were many ways in which fungi affected the welfare of man. He himself might be parasitized by ringworm fungi of various kinds or by more obscure but more virulent forms; his ox and his ass might likewise suffer from similar diseases. Fungi levied a constant and sometimes disastrous toll on his crops, and the fruit he grew was rarely without spot or blemish unless precaution was taken against attack. The larger fungi often killed forest trees, or produced a "wet rot" which would cause structural defects if the timber was used haphazard. Moreover, all fallen logs, leaves, herbs, grasses, and other organic material were gradually removed by fungi. Without saprophytic organisms acting in this way the surface of the earth would soon become so covered with remains that seedlings would be unable to take root or obtain food, and vegetation—and life as we knew it—would end. But if man wished to preserve anything organic for his own use he must wage constant war against fungi. If his buildings were not kept dry and well ventilated the woodwork was almost invariably attacked by the dreaded dry-rot fungus, *Merulius lacrimans*. His stored food must be dry, or sterilized, or kept at a low temperature, otherwise it would rot and putrefy. But all fungal action was not to man's disadvantage. Every nation had its fermented liquors; yeasts raised the dough in breadmaking; moulds ripened cheese. Modern practice was to control the age-long methods, for otherwise there might result products other than those traditionally

anticipated. Man, moreover, was beginning to harness fungi to carry out processes according to his wish. Taka diastase, used so much in medicine, was produced by the same fungus which fermented soy sauce, the basis of all table sauces. In spite of Italy's being at war there was abundant citric acid, for it was easier to produce this by mould fermentation than to extract it from lemons. Just as man depends on green plants for his existence and developed them for his enjoyment so he depends equally on saprophytic fungi and was using them in increasing measure for his benefit.

HOSPITALS AND GAS CASUALTIES

NOTES ON RECEPTION AND MANAGEMENT

Should the enemy employ gas the medical services would inevitably be heavily taxed and the hospitals would be confronted with a number of new problems, both clinical and administrative. Some of these must remain unforeseen. For others, past experience and various sources of information provide a solution. As with bombing, so with gassing: modifications of plan and method in respect of the collection, transport, hospital treatment, and evacuation of casualties would evolve from experience derived in new situations. In the meantime it must be considered urgently necessary to establish in every suitable hospital in the country a state of preparedness for such contingencies as can at present be anticipated. Such preparedness demands thought and action and training, but need not involve any undue elaboration or expenditure. Much information and much instruction have already been issued on decontamination and the treatment of the individual case. Outside the hospitals training and preparation should by now be well advanced. The present notes relate to organization within the hospital.

Medical Officers in Charge of Gas Casualties

In every hospital capable of receiving casualties there should be at least one physician whose duty it would be to take charge of the reception, sorting, and care of gas cases. From the available manuals and other literature, and attendance at lectures or courses, he should make himself acquainted with the essentials of diagnosis and treatment. He should hold himself responsible for the instruction of house officers, sisters, nurses, and orderlies, and, in the teaching hospitals, of students, in the methods of treatment advocated for casualties due both to the vesicant and to the pulmonary irritant gases: where staff is short the co-operation of dental surgeons for assistance with oxygen therapy and apparatus could also be sought. In conjunction with the medical superintendent or medical officer in charge, he should ensure the arrangement and equipment of the hospital decontamination centre. He should personally supervise the training of a decontamination unit (male and female). In conjunction with the medical superintendent or medical officer in charge he should acquaint himself with the storage, source, and reserve sources of supply of oxygen cylinders. He should procure or improvise* sets of apparatus for the distribution of oxygen from one cylinder to several patients. He should ensure that all those likely to be concerned understand the use of the nasal catheter, the B.L.B. mask, the spectacle-frame outfit, and fine-adjustment valves and flowmeters, and that there is a sufficient supply of all of these and of rubber connexion tubing and glass connexions.

Organization

As with wounds, so with gas casualties: "reception and management" may be held to cover decisions in relation to (a) the initial reception and sorting of cases; (b) the grouping or separation of cases into categories for special treatments; (c) the disposal of cases, including suitability and optimum time for transportation elsewhere of special types of case. Such decisions clearly require different consideration and arrangements in the case of vesicant and pulmonary irritant casualties.

* A note on inexpensive improvised distribution will be issued later.

Reception and Management of Casualties due to Vesicant

Although every hospital should have its decontami centre and a trained decontamination unit it should not, good co-operation on the part of the public, the A.R.I vices, the first-aid posts and cleansing centres, be called to deal with the generality of mildly or moderately taminated cases. It should, however, expect to handl severely contaminated cases (liquid) or persons who hav recently contaminated (liquid or vapour) when withou mask or otherwise inadequately protected; (b) cas simultaneous wounding and gassing; (c) its own per who have been exposed in or in the neighbourhood hospital. Of such cases, once decontaminated and in r of initial treatment for skin and eyes, it should be pc (when necessary) to evacuate the majority as stretch sitting cases forthwith or at an early date, excepting those whose associated wounds are of such severity as t clude movement.

During the hours or days following a local gas attack probable that cases other than those in the above cate would begin to arrive for treatment of developed le Minor skin and eye cases could be treated as out-patien if desirable on other grounds, evacuated. Admission be necessary for cases of severe or extensive skin lesion which a good supply of cradles is necessary. Again, hov the evacuation of most of these, excepting the more s broncho-pulmonary cases, should generally be justifi Cases in the above categories would be in a stage past in which further decontamination by washing would be sary or, in fact, of any value. In the case of persons rec gassed and suffering from wounds and wound shock, d tamination should not go beyond careful undressing with use of scissors, attention to exposed parts, initial treat of the eyes, and cropping of hair if liquid contaminati suspected. Once undressed and so treated, patients wou longer present any dangers to those working in the oper theatres or to other patients or personnel in a ward.

Casualties due to Pulmonary Irritant Gases

Phosgene casualties on or soon after arrival may be veniently sorted into (a) mild, (b) moderate, and (c) s categories. The "mild" cases (perhaps 50% or more o admissions) may present with such symptoms as cough tightness or pain in the chest, but with good colour, the rate and quality not greatly or at all disturbed, little dyspnoea, no cyanosis, and no physical signs of pulm oedema. Such cases should be treated in a separate ward the weather permits and war conditions are no contraindica in tents or marquees, on balconies, or otherwise in the They can be nursed on stretchers if beds are not avail They should not be allowed to exert themselves or to ge they may be given fluid nourishment as required and sedatives.

The "moderate" cases will show the same sympton more severe degree, with the addition of more "tightne the chest," dyspnoea, and perhaps slight forms of cya They can be similarly treated, and may be further ben by the administration, for a few minutes at a time quarter of an hour, of pure oxygen from an ordinary ni oxide bag with small, easily movable cylinders. In this one nurse or orderly can take charge of some dozen c Once a sufficient improvement is manifest, oxygen the can be discontinued. Should any case, on the other h deteriorate in spite of these measures, continuous ox therapy must be immediately instituted.

The "severe" cases (perhaps 20% or less of the admissi show urgent dyspnoea. Blue or grey cyanosis may be pr or appear, often with auscultatory signs of pulmonary oe or with actual expulsion of froth from mouth or nose. T may be collapse, with feeble pulse, low blood pressure, cold extremities. The cases should be treated from the with continuous oxygen given in sufficient quantity to m tain a pink colour. It may be necessary to continue treatment for twenty-four, forty-eight, or even seventy hours. The closest watch must be kept on such cases an the efficiency of the cylinders and oxygen-feeding appar It may be necessary to raise the feet and lower the hea facilitate the escape of oedema fluid. Ideally, no patient

known to have been exposed to phosgene gas or who sents indisputable symptoms should be evacuated to a ance or otherwise than as a stretcher case for a period of ty-eight hours. Exertion may bring on serious symptoms a patient previously but little affected. No case requiring inuous oxygen is likely to be fit for evacuation in under eek. Absolute rest, fresh air, oxygen, posture, adequate ds, and good nursing are the essentials of treatment. The egation of the severe from the mild cases is important m the psychological point of view as well as to ensure xtive supervision and treatment.

There should be a weekly "drill" in reception, decontamination, and oxygen therapy, employing personnel as atients."

All hospital personnel should be instructed to keep their s-masks near their place of work. On one day in each week personnel should wear and work in their gas-masks for a ater of an hour. They should also carry A.G. No. 2 ument with their masks.

AWARD FOR GALLANTRY IN CIVIL DEFENCE

e award of the George Medal to Dr. LAURA BATEMAN, dical officer, Brook Hospital, Shooter's Hill, is announced a *Supplement* to the *London Gazette* dated June 13. The announcement reads as follows: "When the Brook spital was bombed two maids were imprisoned by debris. Bateman quickly relieved the suffering of the first maid. the other was buried under girders and masonry. Dr. teman volunteered to crawl under the wreckage and minister an anæsthetic. A porter held her, suspended by r ankles, while she reached the casualty and successfully ried out the injection. A slight subsidence might have sulted in her being trapped and fatally crushed. The nger was very apparent, but this did not deter Dr. Bateman m carrying out a gallant and difficult action."

ROCKEFELLER MEDICAL STUDENTSHIPS

the *Journal* of March 15 (p. 368) we announced the facilis generously offered by the Rockefeller Foundation for itish medical students to pursue clinical studies in medical hools in the United States and Canada. The composition as given of the British committee formed (with Sir John xford as chairman) to select between twenty and thirty idents from among those nominated by the deans of medical hools in this country. Nearly a hundred applications were ceived and about two-thirds of the candidates were interwed. The following are the names of those chosen by the lection committee for Rockefeller medical studentships. These enty-six students are being sent to nineteen universities in e U.S.A. and Canada.

Name	*University Medical School*
BAINBRIDGE, J.	Oxford
BARTLEY, C. W.	London Hospital
BEAZAN, E. F. B.	Liverpool
DAVIES, J.	Leeds
EDWARDS, D. A. W.	Cambridge
FLOWER, M. A.	Cambridge
GIBSON, J. B.	Edinburgh
GOSLING, R. H.	Birmingham
GRAY, I. R.	University College, London, Faculty of Medical Sciences
HARE, P. J.	University College, London, Faculty of Medical Sciences
HAY, P. R. A.	Cambridge
HILTON, M.	Cambridge
O'HEA, M. A.	Glasgow
REID, D. A.	Cambridge
RANKINE, G.	St. Andrews
SCOTFORNE, R. J.	Leeds
SHARP, J.	Manchester
SHEPPARD, R. H.	University College, London, Faculty of Medical Sciences
SHEPPARD, J. V.	Liverpool
SHILLINGFORD, J. P.	London Hospital
STEPHENS, J. D.	St. Andrews
STOKES, J. M.	Cambridge
STYER, G. I. M.	Oxford
TANNER, J. M.	St. Mary's Hospital
TOOD, I. P.	St. Bartholomew's Hospital
TREVER, R. G.	Cambridge

Reports of Societies

DERMATOLOGY IN MILITARY PRACTICE

In an address delivered to the North of England Branch of the British Medical Association at Newcastle-upon-Tyne Major R. M. B. MACKENNA, Command Specialist in Dermatology, Northern Command, discussed a number of points in practical dermatology which had arisen in his Army experience.

Major MacKenna said that a reference to the Official History (1923) of the last war showed that, with the exception of pediculosis corporis, the cutaneous diseases which then caused most absence from duty were those most prevalent in the Home Army to-day. Scabies with its septic complications, infected (impetiginized) seborrhoeic eczema, impetigo contagiosa, ecthyma and furunculosis all had a high incidence in the last war and had engaged attention during the present one; but the group of diseases classified as "inflammation of connective tissue," including abscesses, boils, pyodermia, and the like, had not been so prevalent as in peacetime. The incidence of diseases such as *moniliasis* and *plantar warts* had been low.

Treatment of Scabies

In the 102nd Field Ambulance during the last war scabies was treated by means of a solution of sodium thiosulphate and a dilute mineral acid. In recent years this routine had been popularized by Wernick in Germany and Huber in Hungary. It had the advantages of therapeutic efficiency, rapidity of action, and cheapness. After a bath or a wash with hot water a 40% aqueous solution of sodium thiosulphate was applied to the patient, from the neck to the feet, with careful attention to the flexures and the webs between the fingers. The solution having dried, the patient was then swabbed or sprayed with a 5% aqueous solution of hydrochloric acid. A whitish precipitate of sulphur and salt appeared on the skin, which was allowed to dry, and the process was repeated. When the second application of acid had completely dried, the patient put on clean clothing, his former clothing meanwhile being disinfected. The whole process was repeated on the following day. This routine was not advisable with children on account of the coughing and discomfort caused by the liberation of sulphur dioxide.

Another good treatment was Nielsen's ambulatory method. During a hot bath the patient was cleansed thoroughly with soft soap, and while still wet his body and limbs were painted with the following solution, applied with a brush:

℞ Isopropyl alcohol, Benzyl benzoate, Soft soap } āā partes aequales.

When the solution had dried a second application was made, and twenty-four hours later the patient had a cleansing bath.

These were two modern methods of treating scabies, but Major MacKenna had found Marcussen's ointment satisfactory when properly prepared and used with discretion. Two quick baths were given each day. After the second bath, in the afternoon, the ointment was applied from neck to feet. By this technique the incidence of sulphur dermatitis was kept low. The average number of days on which the ointment was applied in 100 consecutive uncomplicated cases was 3.7. There was a similarity between the reaction to sulphur and to ultra-violet rays. The red-haired subject invariably developed sulphur dermatitis after a minimal exposure to sulphur; the brown-haired blonde was more immune, and sulphur dermatitis very seldom developed in the brunette.

Ecthyma

Ecthyma, which was uncommon in civilian practice, gave rise to a good deal of prolonged invalidism during the last war. It usually developed as a complication of scabies or pediculosis corporis, and had been defined as a deep or dermic impetigo, differing only in degree from impetigo contagiosa. These cases had caused him some anxiety in military practice because of their very slow response to treatment. Hot fomentations, kaolin poultices, acriflavine emulsion, eusol compresses, perchloride of mercury lotion, iodine, and starch paste had all been tried, but the ulcers were indolent and intractable. Then he recalled that many authorities believed the condition to be streptococcal in origin, and he tried the effect of giving sulphanilamide or sulphapyridine by mouth, but the response was disappointing. Finally he tried the effect of crushing a tablet of sulphapyridine to fine powder, pouring this into the ulcer, and sealing it in place by means

of a piece of gauze or lint thickly smeared with Lassar's paste. He found this to be a very successful line of treatment, to which few cases of ecthyma failed to respond. The same treatment was quite useful in impetigo contagiosa, particularly in those cases in which the oozing was not too copious; and it was also a very satisfactory treatment of chancroid. It was interesting to find that better results were obtained by the crude method of crushing sulphapyridine tablets to fine powder and using this as a local application than by using powdered sulphanilamide.

Major MacKenna also described a case of chronic meningococcal septicaemia—a condition to which there was a brief reference in the *Medical History of the War* of 1914-18, but which seemed to have been forgotten, except by a few authorities, during the last twenty years. He had come across one case, which seemed to be an almost classical example, in a young officer who had had a sudden rigor followed by a rise of temperature; the fever subsided after a few days, but was followed some weeks later by another rigor, necessitating admission to hospital. For two days he had an intermittent temperature rising to 103°, but beyond this there were no definite symptoms or signs. After ten days, during which clinical investigation was made and no reason for the pyrexia was found, he returned to duty, but had another rigor, and came back to hospital with an intermittent pyrexia which lasted for three days. On investigation the only finding of significance was a leucocytosis of 10,000 cells per c.mm., without alteration of the relative proportions of the leucocytes. A further rigor was associated with the development of reddish nodules on the limbs, swelling in the elbow-joint, and pains in the knee. A blood culture was taken during a period of pyrexia, and meningococci were isolated. In a second case meningococci were again cultured from the blood stream. Each case cleared up under intensive dosage with sulphapyridine (a total amount of about 30 grammes being given), although in the first case, small doses of sulphapyridine had been administered when the patient first came into hospital, but had not cured the disease.

Major MacKenna continued his address with some remarks on sulphapyridine in the treatment of gonorrhoea—a full account of which will be found at page 958 of this issue.

SAFETY IN SURGICAL TREATMENT OF RECTAL CANCER

At a meeting of the Section of Proctology of the Royal Society of Medicine on June 11, with Mr. W. B. GABRIEL in the chair, a discussion took place on the factors which make for safety in the pre-operative and post-operative treatment of carcinoma of the rectum.

Prof E. R. FLINT founded his opening remarks on 86 cases in all of which colostomy was done, but in only 49 subsequent excision of the rectum, giving a proportion of 58% in which he thought excision was justified. Unless surgeons were engaged in special hospitals for dealing with these conditions their operative experience was not likely to be large, therefore the surgical methods in use should be standardized so far as possible from the point of view of the safety of the patient. The excision in all these cases was done according to Kraske's method, which he thought to be safer generally than the abdomino-perineal, except in the hands of surgeons of great experience. Unless there was acute obstruction, patients with carcinoma of the rectum were not extremely bad risks. Nevertheless, operation was a tax upon them, and two pre-operative measures advisable were colostomy and blood transfusion. When faeces were diverted from the affected part, excision was rendered much safer in that the virulence of organisms in the neighbourhood was greatly diminished and the rectum could be cleaned. There was no doubt that after a colostomy had been carried out and given time to function properly the condition of the patient was immensely improved. Blood transfusion was customarily given the day before the operation and if necessary was continued at the time of operation and afterwards. Infection might occur when the gut was cut across, or it might take place subsequently in the form of cystitis. To avoid infection of the wound he divided the colon between clamps, burnt the end which was left, and infolded it in the same way as with a duodenal stump in gastrectomy, taking care that the cut end did not come in contact with the wound. At the end of the operation he put in a three-way Carrel tube through which Dakin solution was syringed, and gauze soaked in Dakin lightly laid against the whole surface. The same purpose might perhaps be serve by powdering the surface with a sulphonamide compound To avoid cystitis, which might be fatal, he irrigated th bladder by the continuous method. Apart from the continue irrigation through the Carrel tube and the continued irrigatio of the bladder there was not very much necessity to d anything further.

Pre-operative Considerations

Surgeon Rear-Admiral GORDON-TAYLOR said that one of th most important pre-operative measures was an early decisio by the surgeon as to the type of operation he proposed fo the particular patient. The surgery of cancer was surgery c the lymphatic system, and for many patients the "com bined" operation would carry a heavy mortality. The nex pre-operative measure of importance was that the surgeo should be skilled, experienced, and judicious. He woul consider the age, sex and race of the patient, also the cardio vascular, nervous, and urinary systems; pulse pressure woul also need consideration as indicative of the type of operatio to be performed. Any surgeon of experience would bewar of the patient who was extremely apprehensive, also of th one who "changed his religion the night before the operation or who kept the theatre waiting while he finished his auto biography." Age offered no barrier: most surgeons woul have performed excision successfully in patients over seventy Women stood the "combined" operation better than men Some races were a bad risk. There was no doubt that pre liminary drainage helped enormously.

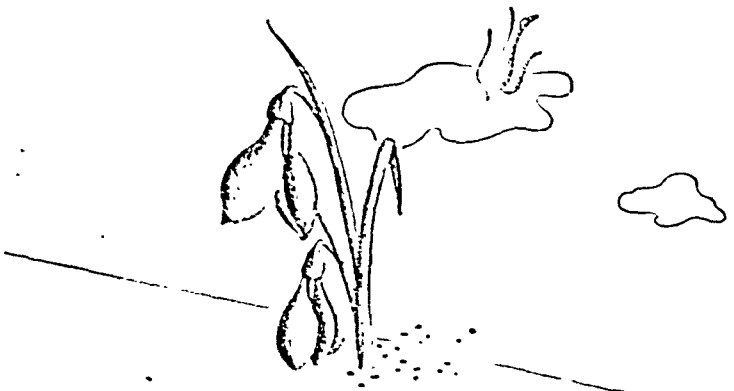
Dr. CUTHBERT DUKES indicated certain ways in which th pathologist could help. It had been the practice at St. Mark' to carry out a routine biopsy in all cases, and this ofte afforded important information as to both the growth an the ability of the patients to stand the operation. Of chie importance was the recognition of anaemia and of defectiv renal function. The pathologist could also be of assistanc in post-operative complications.

Mr. NAUNTON MORGAN said that the control of pre- an post-operative fluid balance was essential, and in a majo operation it was necessary to give an additional 500 to 1,00 c.cm. of fluid. A large amount might be lost by vomitin and must be replaced. The giving of fluid by the mouth might be dangerous, and after excision of the rectum fluid should be given by the intravenous route. Bowel activity might be encouraged by the use of small enemata after flatu or faeces were passed; large enemata should not be given, a distension might cause kinking. Everyone would agree tha routine blood transfusion had reduced the mortality rate.

The Anaesthetist's Part

Dr. T. FRANKIS EVANS spoke of the anaesthesia in such cases. He would first see the patient, learn his temperament, gain his confidence, and give him some reassurance. Examination of the heart, arteries, and lungs should be carried out; it was essential to know of any degree of anaemia, and the blood urea was an excellent criterion of general bodily function. Long operations made shock more likely, and the operation of abdomino-perineal excision had been shortened by the simultaneous work of two surgeons. The anaesthetist should choose the type of anaesthetic which would render the surgeon's work as easy as possible. He believed the best results were obtained after preliminary sedation with omnopon and scopolamine, which he used in preference to morphine, followed by the intravenous use of pentothal. This was followed by a spinal anaesthetic—he preferred percaine. After indicating other anaesthetic procedures, the speaker mentioned the necessity for giving fluids intravenously, and not by mouth, to avoid sickness.

Dr. RONALD JARMAN said that the main points of safety to be considered were the condition and comfort of the patient, team work, type of anaesthetic, and after-treatment. The patient should be reassured and allowed to get to know everybody concerned in looking after him. If the surgeons and anaesthetists were used to working together it made for greater speed and safety. There was not much for the anaesthetist to do after the operation, but he should be prepared to give whole blood or solution in glucose, whichever the surgeon thought necessary. He himself had had five deaths out of 500 cases on the table—two from coronary thrombosis, two with fatty heart, and one from shock—and the range of ages was from 27 to 77. The success of the operation turned



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SAFETY IN SURGERY OF RECTAL CANCER

largely on the speed with which it was done. When patients had partly collapsed on the table dramatic recoveries had been seen on giving a pint of whole blood straight away. From the results of his cases, he believed that pentothal intravenously, light paraffin as a spinal, followed by nitrous oxide and oxygen, were the anaesthetics of choice.

Surgical Procedure

Lieut.-Colonel J. A. MACFARLANE, R.C.A.M.C., said that the risk of obstruction before operation was of the greatest importance. He did not agree that there should be a standard operation; each case should be considered on its merits. Patients should be in hospital for at least ten days before operation and put on a diet of non-residue fluids. If there was evidence of chronic obstruction when the abdomen was opened there should be no hesitation about dividing the operation into two stages, changing one's mind and doing a colostomy, and leaving the patient for a further period of two weeks during which the distal loop should be washed out daily. In acute obstruction it was his experience that satisfactory as an immediate procedure carried with it a high mortality, and it was his practice to do a blind caecostomy under a local anaesthetic, which got the patient over the emergency and left time for thorough investigation and planning of the best operation for the type of case.

Mr. LAWRENCE ABEL was interested to find that Col Macfarlane's procedure was so closely parallel with his own. He agreed with what he had said about getting the bowel clean before operation, and his experience was that if the urine was clean the bowel was clean. No patient who had had a laparotomy should be allowed to drink anything at all, and the bowel began to move; water, salt and sugar should be given by the intravenous route. He recommended the use of fractionated rather than distilled water. A point which had not been mentioned was the question of moving the patient: the more ill the patient the more quickly he should be moved out of bed. The average case with tables should be moved out of bed a little over twenty-four hours after operation, if only for a few moments, and on the second day for a longer period, and then remain up for twenty-four hours.

In some further discussion Dr. MOLLISON pleaded for the use of whole blood rather than plasma or serum. Mr. E. T. C. MILLIGAN mentioned factor, which made for speed in operating; Mr. TURNER WARWICK spoke of the importance of guarding against bladder infection; and Mr. DICKSON WRIGHT spoke of the value of dusting the wounds with sulphanilamide powder. In some recent cases he had used a sulphonamide tablet with excellent results. One advantage was that the patient absorbed the substance into the blood stream and primary complications were prevented.

A Comparison between Two Cities

Glasgow and Birmingham are of almost the same population—just over a million—and in an address to the Scottish Branch of the British Hospitals Association recently, Mr. T. W. Place, honorary secretary of the Contributory Schemes Association, used this fact to make a rather telling comparison in favour of contributory schemes. He said that the amount provided to Glasgow hospitals in 1939 was almost the same as that handed to Birmingham hospitals in the year 1926 before the introduction of the contributory scheme—namely, £100,000. But in 1939 the Birmingham hospitals received over £250,000 from the contributory scheme, and in addition paid some £60,000 to hospitals outside the city for treatment given to patients. In 1939 the Glasgow Royal Infirmary received about £34,500 in workers' contributions, plus another £22,000 from general subscribers, whereas in Birmingham the amount handed over to a comparable hospital was £80,000, with another £10,000 from subscribers. The differences were, in his view, an unanswerable case for setting up a contributory scheme in Glasgow. It was mentioned at the same meeting that all the regional committees with the exception of Dundee had approved generally of the proposals for the reorganization of voluntary hospitals, and the scheme was being extended to include hospitals under local authorities.

Incidence of Rheumatism in Scotland

In an address at the annual meeting of the Edinburgh Cripple and Invalid Children's Aid Society, Prof. L. S. P. Davidson said that if some investigations of the incidence of rheumatism in the north-east of Scotland held good for the whole country then 300,000 persons in Scotland went to their doctors annually for treatment for rheumatism of one kind or another. Perhaps 60% or 70% suffered from the simpler forms of muscular rheumatism but a large proportion were very seriously crippled, and from 50,000 to 60,000 persons in Scotland were crippled so completely as to be unable to work for at least sixty days in the year. He drew attention to the inadequacy of hospital treatment available for chronic rheumatic disease. Probably not more than 10% of those suffering from this condition could depend upon adequate institutional facilities.

Local News

SCOTLAND

Tuberculosis Campaign in Scotland

At the recent annual meeting of the Royal Victoria Hospital Tuberculosis Trust, Edinburgh, Prof. Charles M'Neil, who presided, said that when one looked at the figures for tuberculosis it might seem as if the disease had been conquered. That easy optimism was never entertained by the late Sir Robert Philip, who founded the Trust, nor was it entertained by the executive of the Trust to-day. While the family tragedies which once occurred were now rare, the minute seeds of the disease were still sown within the family, and preventive medicine was addressing itself to the early eradication of infection. Sir William Carnegie said that the executive believed that suitably equipped sanatoria ought to be distributed all over Scotland to work in conjunction with the local authorities. In the annual report of the Trust, which was adopted at the meeting, it was urged that statutory recognition should be given to "care work" in Scotland, including measures to assist the patient before he went into hospital, to help his family, and to consolidate his recovery. This was a special field for voluntary organizations to work in liaison with the official services.

ENGLAND AND WALES

The Birmingham United Hospital

The report for 1940 of the Birmingham United Hospital, which includes the General and Queen's and the Queen Elizabeth Hospital, has now been published. When the effects of air bombardment began to be felt the Board decided that the General and Queen's Hospitals should be organized as casualty clearing stations and that the bulk of the normal civilian work should be concentrated at the new hospital. Nearly 600 beds are now constantly in use at the Queen Elizabeth, whose steel fabric and isolated site render it comparatively safe. At the General Hospital, in collaboration with the Ministry of Health, a system of frequent and rapid evacuation has been worked out by which patients are sent to the country as soon as possible after operation or the completion of other necessary treatment. By this means, though less than the half the usual number of beds is available, the General Hospital actually dealt with a larger number of in-patients in 1940 than in 1939, and the number of operations in the various theatres increased by over 5,000 in the year, this increased surgical work being due mainly to accidents in the black-out and in factories. During the year under review air-raid casualties were treated in the United Hospital. It is stated that the work of the first-aid and rescue parties and of the ambulance service in Birmingham has been excellent. The hospitals receive casualties very soon after the bombs have fallen, and the casualties have been handled well and carefully, with no harmful interference. The Board of the United Hospital has therefore decided that, at no matter what cost, it will continue to provide a casualty service in the centre of the city, so that the wounded may be efficiently treated without the delay and discomfort of journeys to other areas. The buildings of both the General and Queen's are old and fragile, and, deeming it necessary to have some premises in reserve, the Board have taken the basement of some business premises for use as an operating theatre, with three

tables, an *x*-ray room, and a sterilizing plant. This emergency hospital is seventeen feet below ground, with seven floors of steel framework above it, and is ventilated by a forced intake of air. The Board has also assumed responsibility for an outlying subsidiary hospital for convalescent patients.

Salaries of London District Medical Officers

The London County Council is revising the salaries of officers of the district medical service. The proposals of the Hospitals and Medical Services Committee provide, with a few exceptions, for a general reduction in salaries and allowances consonant with a general diminution in the work throughout the county of London. In eight districts, however, the work has been found to have increased, and increases of salaries of two district medical officers and six assistant officers appointed to those districts are proposed. Under the Public Assistance Order, 1930, the consent of the Minister of Health must be obtained before the remuneration of a senior Poor Law officer is reduced, and three months' notice of such reduction must be given to the officer concerned. In cases coming within this provision the revised salaries and allowances will operate from September 1 next for one year or until any reorganization of medical relief districts necessitates their revision; in the remaining cases the proposed effective date is July 1. The reductions of salaries apply in seven cases, and in six of these the provisional allowances are wiped out. The provisional allowances granted to twenty-eight district medical officers are reduced, as are the provisional salaries of forty-three assistant medical officers. Some of the reductions are quite considerable: for example, a salary of £300 is reduced to £165, another of £300 to £210; provisional allowances are reduced, in one case from £165 to £55, in another from £225 to £120, in a third from £124 to *nil*. The largest addition to salaries or allowances proposed is from £225 to £310. The proposals are estimated to result in a saving to the Council of just over £5,000 a year.

Correspondence

America and British Science

SIR,—Some of your readers may have seen my letter to the *Times* of June 20, on the generous gifts recently made to the Royal Society by scientific societies of the United States of America—an earlier one of 10,000 dollars from the American Philosophical Society "for the aid of science in Britain," and now, last week, a gift of 5,000 dollars from the American Physiological Society "for the support of scientific publications in Britain, especially in physiology."

A natural and helpful comradeship between medical men of different countries has always been at least as strong among the physiologists as among those whose work is in other branches of medical science or practice. Certainly we British physiologists are on terms of sufficient intimacy with our American colleagues to know well that the American Physiological Society, like our own, depends for existence and support on the efforts and the contributions of members who are working men of science. Their gift will assuredly have a direct importance for the object which they named in making it; but while we gratefully recognize its immediate and intrinsic value, we shall not miss the wider meaning of the fraternal impulse which determined this fine and generous action. We shall be sure that it symbolizes a desire of our American friends to share with us, as far as national policies allow, in the losses which are being encountered in defence of ideals which are theirs as much as ours.

Such gifts, indeed, are among many signs of the fuller understanding which comes with the recognition of a common peril and a common duty. An interchange of medical personnel has begun. The generosity of the Rockefeller Foundation is enabling a chosen batch of students to go to American medical schools; there must certainly be more of such interchange after the war, and in both directions. Qualified American medical volunteers are arriving in this country. Close collaboration in scientific researches more directly concerned with warfare, has for some time been a necessary and well-established condition of America's share in the equipment of our Forces. Surely it is clear that the greatest gain which can come to us, and to the world, from a war in which so much has been and must yet be sacrificed, is this closer and more conscious unity between peoples who have always been bound together, not merely because they speak the same language and share so much of history and tradition, but because their ideals and their outlook on life are, in very truth, essentially identical. To see in the promotion of such unity the best hope for the future, to work for it in every way and to guard it from the weakening effects of sectional aims and factitious differences, seems to be the best acknowledgment that the medical and scientific men of Britain can at present make to the American colleagues who, with a noble and simple generosity, are showing their desire to be identified with our cause.—I am, etc.,

Hampstead, June 22. H. H. DALE.

Crush Injuries

SIR,—In your issue of March 22 there appeared three papers by Bywaters and Beall; Beall, Bywaters, Belsey, and Miles; and by the M.R.C. Subcommittee dealing with crush injuries suffered during air raids that were followed by renal failure and, in many cases, by death from uraemia. A leading article in the same issue drew attention to these so far inexplicable phenomena and called for animal experiments to elucidate them. In these articles the work of E. Andrews of Chicago (*Arch. int. Med.*, 1927, 40, 548) appears to have been overlooked. Andrews worked on renal and metabolic problems of acidosis, which he induced by giving large quantities of hypertonic NaCl solution to dogs intravenously. During these experiments he accidentally tied a limb of a dog too tight to the operating table so that it became oedematous. On releasing the leg and massaging it immediate and complete anuria set in, followed by a rise of blood pressure, nitrogen retention, coma, convulsions, and death. At necropsy oedema of the brain was found, but no renal lesions were present. The experiment was frequently repeated and identical results were obtained. When the suppression of urine was not complete the urine contained albumin and granular and hyaline casts. The author believes that faulty carbohydrate metabolism in the affected limb was responsible for the results. Andrews also observed simultaneously with the anuria a considerable movement of calcium out of the cells in favour of potassium. On this was based an attempt to counteract the process by giving massive intravenous doses of calcium, and thereby he was able to institute immediate diuresis with subsequent recovery of the dog.

All the human cases of crush injury under air-raid conditions can be said to suffer from acidosis induced by starvation and exhaustion. In the paper by Bywaters and Beall a lowered alkali reserve was in fact observed and taken for an indication to stop further saline administration. All the reported cases showed considerable oedema of the crushed extremity. Thus, the parallelism of these cases with the experiments of Andrews appears rather convincing, and his attempt at reversing the condition seems to merit close attention.—I am, etc.,

London, W.1, June 15. G. SCHOENEWALD.

Da Costa's Syndrome

SIR,—Dr. Paul Wood has rendered an important service by the publication of his Goulstonian Lectures. It may be hoped that they will assist medical officers in the Services and members of Ministry of Pensions Medical Boards in dealing with these difficult cases, which can no longer (as in the last war) be classified simply as "V.D.H." or "D.A.H."

Dr. Wood has enumerated the aetiological factors that have been described by various authors, but it may be doubted whether many of these writers had much "first-hand" knowledge of the soldier's life. No one doubts that personal and family histories are of great importance, but there were many other factors in the last war that conduced to the production of Da Costa's syndrome, and, apart from deliberate attempts to obtain discharge from the Service by eating toxic substances—for example, cordite, soap, or tobacco—there were many other causes. One potent factor was the endeavour to train recruits (too often entirely unaccustomed to physical exercises in civil life) in the minimum time. The instructors were usually hard-bitten old soldiers who showed their contempt for "conscripts" by shouting: "I'll make you or break you."

Another aetiological factor was excessive smoking, especially before breakfast. I have often seen recruits going down to

e ablution benches smoking at 5.30 a.m. (reveille was rlier in those days!). May I relate a personal experience at convinced me that tobacco might be a cause of Da Costa's ndrome? In 1935 I began to suffer from moderate dyspnoea exercise, occasional (L.) inframammary pain, and palpita-on. I consulted Dr. G. E. S. Ward. His first question fter an electrocardigram) was: "How many cigarettes do u smoke?" I replied: "I seldom smoke in the daytime, but ay smoke six or eight cigarettes when reading after dinner." r. Ward's comment was: "You take your poison in con-ntrated doses; you must cut it down." I replied: "If that the cause I will cut it out entirely." I did so, and all the squieting symptoms vanished quickly. I have smoked only ie cigarette since September, 1935; that was pressed upon e by a friend at a mess dinner four years later. I did not ijoy it and have not felt any desire to smoke again. In ctober, 1939, I was passed "fit for general service." The edical officer who examined me said that my blood pressure as only 135/90. While I smoked my systolic blood pressure id been 142 to 146 for more than twenty years.

We know that Vaquez and other eminent French cardiolo-sts considered that tobacco, alcohol, and black coffee were ie three most potent causes of cardiovascular disturbances ifty years ago no men in training for athletic sports were ermitted to smoke. Is it not probable that the modern laxation of that rule has not improved the health of the sing generation?—I am, etc.,

Nether Stowey, June 13. C. W. J. BRASHER.

SIR,—I was much interested in Dr. Paul Wood's lectures May 24 and 31 and June 7), and I wish to compliment him n his magnificent work. Personally it afforded me peculiar ratification inasmuch as I had, to a certain extent, arrived at imilar conclusions in another sphere of research. Like him, hope that the diagnosis "effort syndrome" will be dropped, ut, like many others, I also hope that no more syndromes or liseases will receive a person's name, and for the want of a etter term I suggested "emotional D.A.H." in a preliminary eport published in the *Practitioner* in September, 1940.

In all the cases I have investigated, a *central taint*, the result f fear, could be discovered, but I am not unmindful of the act that strain may be an aggravating factor. Furthermore, t is my opinion that D.A.H. is relatively a lesser concern in his war because the Army is now largely mechanized, and in hat way the soldier's heart is not subjected to the strain of he old foot-slogging days.

I have found children's hearts a fertile field for research, nd during the last year I have been investigating such hearts nder the auspices of the L.C.C. and the Finchley Borough Council. This work was unfortunately interrupted by enemy ction and has been further delayed by my inability to get permission from the local authority to examine children's hearts in this area, despite the offer of full co-operation from the War Office and hospitality at the county hospital.—I am, etc.,

Solva, Pembrokeshire, June 11. J. STEPHEN LEWIS.

Treatment of Mustard-gas Lesions of the Eye

SIR,—An instruction (E.M.S. I.252 (revised)) on this subject has been widely distributed to the officers, consultants, and hospitals of the Emergency Medical Service. It came before the Medical Board of Moorfields Eye Hospital "for your information" The Medical Board considered the instruction and felt that several points in it required comment.

1. The use of albucid solution is advised at first-aid posts and at hospitals in cases in which the eyes have been affected by gas vapour or gas splashing. It must be pointed out that the use of sulphanilamide preparations is not directed against gas contamination but only against subsequent infection of the conjunctiva, and that opinion as to its efficiency in this latter respect is far from being generally favourable.

2. No mention is made in the instruction of the very diverse lesions which may be produced by gas, most of them slight and very few of them serious.

3. No indication is given of the treatment necessary when the cornea is definitely involved, and while water is advised for irrigation of the eye at an incident and at first-aid posts, no advice is given as to the lotion to be used for the irrigations recommended at hospitals.

It would appear that this instruction is not in fact the "result of further experience" and should be withdrawn and replaced by a carefully considered and detailed note based on actual experience obtained in the last war and on substantiated experimental evidence.—We are, etc.,

Royal London Ophthalmic Hospital, June 16. F. A. JULER. MAURICE WHITING.

Differential Diagnosis of Contusion of the Brain and Psychoneurosis

SIR,—Dr. W. A. Brend, in an article in the *Journal* of June 14 (p. 885) on the differential diagnosis of contusion of the brain and psychoneurosis, under the subheading "The Clinical Pictures" makes the following statements: "The outstanding feature in contusion is the headache. . . . The sufferers complain of it at once. . . . They describe the pain . . . as being like that cause by a *tight band round* the head. In neurosis, on the other hand, headache is not a typical symptom . . . it is often mentioned only at the end of the story almost as an afterthought." The clinical fact is that headache is a typical symptom in neurosis. In actual practice the neurotic patient in the consulting-room or out-patient department nearly always complains of it, gives it a prominent place in his list of sufferings, and often describes the feeling he experiences as "*being like that caused by* a tight band round the head"

In the next paragraph Dr. Brend writes: "Inability to concentrate is the other cardinal symptom in contusion. . . . A characteristic feature is the forgetting to carry out small intentions. The sufferers go out intending to do something, but return without having done it. . . . The neurotic may complain of inability to concentrate . . . but when pressed to give specific instances he is often at a loss to find any. . . . The contused person is often abstracted; the neurotic is usually too self-centred to leave his luggage in a train." Again, in practice, the clinical fact is that inability to concentrate is a cardinal symptom of neurosis. The neurotic constantly emphasizes the discomfort he experiences as a result of his failure to perform the ordinary routine of the day satisfactorily; and a characteristic feature of this is "the forgetting to carry out *small intentions*."

Finally, one of the commonest complaints made by the neurotic is that he "feels such a fool" because he is continually leaving his belongings in a train, a bus, a tramcar, or a taxi.—I am, etc.,

London, W.1, June 14 MURDO MACKENZIE.

Orthopaedics

SIR,—The letter from orthopaedic surgeons (May 24, p. 791) contained an unfortunately incomplete statement, which, taken out of its context, can be made to look ridiculous. Some later commentators, with an evident bias against orthopaedics, have shut their eyes to the *obvious meaning—namely*, that such physical medicine as is used in orthopaedics is a part of orthopaedics. Most people are extraordinarily ignorant of the scope and methods of orthopaedics, and this is suggested even by Lord Horder's recent report on rheumatism.

It is unfortunate that we are called orthopaedic *surgeons*. Because of this many people think of us only as manipulative or operative technicians. Whatever other people would like us to be, *the fact remains that our work is not so restricted*. Orthopaedics is concerned with the diagnosis, prevention, and treatment of the deformities and disturbances of function of the locomotor system. (I realize that it is easy to pick holes in this: an intracranial endothelioma or a Bartholin's abscess may both interfere with locomotion, but there is complete understanding between neurosurgeons, gynaecologists, and "orthopaedists" in these matters.) The work is done within organizations and in institutions specially designed, equipped, and staffed for the purpose, giving continuity of treatment under unified control from the onset of the injury or disease until maximum restoration has been achieved. At least two-thirds of an "orthopaedist's" time is spent on diagnostic and preventive measures, in which plans must be prepared and decisions taken, determining a period of treatment lasting from a few weeks to many months. We utilize with thankfulness the help of our colleagues in every field of medicine, but in our own particular schemes we are called upon to direct

the whole clinical organization. Equally we co-operate with our medical and surgical colleagues in other fields and leave them to run their shows as they like; often regretting that they do not take more personal interest in the physical therapeutic measures they employ.

The history of the last thirty years of orthopaedics will reveal an intense open-mindedness and keen investigative spirit which has surely contributed very largely to the advancement of medical and surgical practice in modern times. Orthopaedic principles, however, are at least as old as Hippocrates and are not, or should not be, peculiar to orthopaedics.—I am, etc.,

Exeter, June 16. NORMAN CAPENER.

Physiotherapy

SIR,—I have read with such interest the recent correspondence in your *Journal* on the above subject that I am emboldened to crave yet a little more space to sum up the various points which have been brought forward. I feel that I am perhaps privileged to do this, first on account of my advanced age—a fact that I am never allowed to forget by the Army—and, secondly, that I have had the great good fortune to practise this art in types of hospitals and clinics which it has not fallen to the lot of many of the writers to do.

Physiotherapy seems to convey " so little to some " and so " muddled an idea to others " that the attempt to elucidate its aims and objects as set out in letters both in the lay and medical press needs no excuse. In fact were the truth known one could almost apply the words of our beloved Prime Minister: " Never have so many owed so much to so few," to this branch of medicine.

A few pioneers have not only attempted but have succeeded in placing this science on a reputable basis if not on a secure foundation. That the foundation is insecure is not the fault of the pioneers themselves but due to the fact that the peoples of the countries which they have invaded (if such a term is applicable) have been slow to appreciate the benefits of methods with which until recently they have been unacquainted though the majority make use of them. *Timeo Danaos et dona ferentes.*

Physiotherapy belongs to every branch of surgery and medicine, and cannot therefore be relegated to any particular specialty. An adequate knowledge of all its applications requires years of study not only of physics, electrical phenomena, and dynamics, but also of all the organs and tissues of the body, and can therefore be approached only from a very wide perspective. The adviser in physical medicine must above all things be a general practitioner in its widest sense. To approach this subject without a comprehensive knowledge of disease in all its forms is doomed to failure. If assistance is to be given to the surgeon or physician in all the various specialties then surely the adviser in physical medicine must have a wider outlook than that conveyed by the term " orthopaedic physician." To subdivide the subject of physical medicine into watertight compartments to suit every specialty would be a waste of human energy both male and female.

I have the honour of serving a certain hospital in the Emergency Medical Service where has been instituted a regular monthly consultation between all the orthopaedic and neurological surgeons and the physiotherapy specialist, which seems to work smoothly and to be of infinite value at any rate to the latter. In the end it saves time, and instead of the passage of notes between one department and another ideas are exchanged in a friendly atmosphere and the patient undoubtedly benefits. Why should not this atmosphere exist in every hospital or institution? To my mind, the answer is that there lingers in the minds of the surgical and medical staff of most of our hospitals an element of doubt as to the efficacy of physical treatment and the integrity of the physiotherapy specialist. If this is the case then surely there is a remedy.

No confidence will ever be established in the medical mind—though it has long been established in the lay mind—until one of our great universities takes up the investigation of this subject and either substantiates or disproves its claims. What better opportunity could exist than the present crisis, when unfortunately plenty of material for research abounds? I would go further and suggest that the university of choice would be Oxford University, which, through the munificence of Lord Nuffield, has ample funds at its disposal for research of all kinds. Are we to leave this work once again to our allies the Americans or our present foes the Germans? Can not Britain for once be first in the field and demonstrate to the rest of the world that even in the midst of war her energies can be directed towards reconstruction in a tangible and humane manner?—I am, etc.,

Northwood, June 19. L. D. BAILEY.

The Field of Physiotherapy

SIR,—The executive committee of the Society of Physiotherapists have read with interest the annotation on " Physical Medicine, Orthopaedics, and the Services," published in your issue of April 26, and the correspondence which has followed it.

The British Medical Association was mainly responsible for the establishment of the National Register of Medical Auxiliaries, which pledges the physiotherapist registered therein to work under medical direction. We are therefore surprised to note in the letter from the British Orthopaedic Association published in your issue of May 24 that " the British Medical Association, in one of its most successful reports, deplored the system by which surgeons treated their cases to a certain point and then handed them on to masseuses and physiotherapists, so that the surgeons knew nothing of the end and the physiotherapists knew nothing of the beginning." From this statement it would appear that the British Medical Association were discouraging the employment of a body of trained medical auxiliaries whose registration they had promoted and sponsored.

The confusion which still exists in the field of physical medicine is to be much regretted, and the registered physiotherapist has suffered much on account of this. He has been specially trained for this field and his qualifications limit him thereto and to work under medical direction. Physical medicine needs its trained administrators as much as any branch of therapeutics, yet through lack of appreciation of this point many members of the medical profession employ the non-registered worker in this field. We have many examples of this, and have been in communication with the British Medical Association recently on the subject. In this connexion Sir Morton Smart's remarks in your issue of May 24 on the dilution of labour in our field are most timely, and his warning should not be disregarded.

It has been obvious for some time that some authoritative control of physical medicine is essential: whether this is Governmental or independent is not of great import; but it is essential that the right members of the medical profession who know its history, its scope, and its services should be in control of it. May we hope that the correspondence published in your columns will stimulate interested members of the medical profession to take counsel together and endeavour to bring order out of the present chaos.—I am, etc.,

W. D. A. BURNELL,
Chairman, Executive Committee, Society of
London, S.W.1, June 14. Physiotherapists.

Hospital Administration

SIR,—Some play is made in the current issue of a periodical called the *Hospital*, the official organ of the British Hospitals Association and of the Incorporated Association of Hospital Officers, with the advocacy of lay as opposed to medical internal administration of hospitals. This advocacy is quoted as coming most recently from three doctors, in a literary effort entitled " Post-war Hospital Services " and published in the *Lancet*. Reference is also made back to the utterances of a fourth doctor who is styled the *Lancet* Special Commissioner and who expressed similar views. I make no comment upon the fact that the *Lancet* has twice provided grist for this propaganda mill directed against a section of the profession for which it is published. An attempt is also made to rope in the leading article in the *British Medical Journal* on medical man-power, but it misses fire badly because the remarks quoted had no reference to medical superintendents. I would expect the *Journal* to be conducted with too great a sense of dignity and justice to lend itself to an attack upon a medical section which these glib critics describe as " harassed officers, overburdened with work."

So far as I know, no medical superintendent or medical journal has, so far, made an attack upon the type of official variously described as secretary, secretary superintendent, house governor, or administrator, with or without some letters appended. I do not intend to do so and I hope none of my

colleagues will so demean themselves. Lay hospital officers are, like medical superintendents, busy people with a war on their hands. I will, however, make a few general observations addressed in particular to the type of medical critic which has been quoted.

They are, all four of them, much of an age and class so far as can be gathered from the information supplied by them to the *Medical Directory*. I would remind them that they write at a time when a large proportion of their age group is away serving with His Majesty's Forces, and that we will, by their leave, postpone these heavy decisions until those gentlemen who survive are with us again and in a position to add the weight of their views and experience. What serious-minded and experienced full-time hospital workers, medical and lay, are seeking is not a piper revolution in the absence of so many colleagues, but a sane evolution when they return. In the meantime, responsible persons will have no difficulty in putting statements such as that "the post of medical superintendent should be abolished" at their proper valuation. I would say the same, at the present time, of a similar statement regarding lay administrators.

In the final reckoning this question of medical superintendent or lay administrator will not be settled by the authors of "Post-war Hospital Services," or by the *Lancet* Special Commissioner, or by the British Hospitals Association, or by the Incorporated Association of Hospital Officers. It will not, in fact, be settled by any assiduous section grinding a busy axe. It will be settled by the common people, whose servants the hospitals are—by the force of public opinion expressed by their representatives on controlling bodies in the light of their own knowledge gained by experience.

At the present time all mental hospitals, municipal hospitals up and down the country on an increasing scale, many special hospitals, and even some "voluntary" hospitals, are administered by medical superintendents. Other "voluntary" hospitals have, to meet the needs of the Emergency Medical Service, so designated a member of their medical staff. That is a weighty fact. Medical superintendents can, and will, await the decision for their extension or abolition with equanimity. Time, the stress of war, and the knowledge which comes with experience will all work towards a correct and wise decision. I have friends among lay administrators and have too much regard for their worries and difficulties at this juncture to make an attack upon them as a class. Let us get on with the war and leave these spates of frothy wisdom until the piping times of peace, when our colleagues will be with us to help in building something worth while from the wreckage.—I am, etc.,

Reading, June 10. D. CYRIL THOMAS.

Chronic Sick in Bombed Towns

SIR,—The urgent and important problem in the hospital administration of this country raised by Sir Frederick Menzies concerns every large municipality, and is one which up to the present has not been solved. At this stage the Ministry of Health could with advantage include it in its new sphere of action in dealing with hospital accommodation generally. The Ministry before the outbreak of war did not intrude itself too obviously except in an advisory capacity in the administration of our hospitals. It has now launched the Emergency Hospital System and controls a large number of emergency hospitals all over the country.

The chronic sick question, with which Sir Frederick is fully conversant in his capacity as late Medical Officer of Health to the L.C.C., has reached the stage when only the Ministry of Health can and should deal with it. Estimates of the number of air-raid casualties anticipated at the outbreak of war have up to the present, fortunately, proved to be wrong. It is still possible that a larger number of beds may be required than have yet been called upon. These thousands of beds occupied by the chronic sick in our large industrial areas would be invaluable under such conditions.

The humanitarian aspect so rightly stressed by Sir Frederick is one which should appeal to all. It is astonishing that the leaders in our churches, our religious societies, or some strong voice from this wilderness of chaos, have not cried out on behalf of these poor and tormented souls. I have seen no record of any concern or effort by our colleagues in the House of Commons. This is surely a subject which should come within their purview. At the present time humanitarian grounds alone are sufficient reason, and indeed the principal one, for urgent steps to be taken for the transfer of these sick persons to quiet rural areas.

Large numbers of country houses have been taken over by the British Red Cross and other charitable societies. They have been fully equipped, and most of them staffed by local V.A.D.s, to take in patients. They are still empty and the V.A.D.s are bored and disheartened with no work to do. I have found that nursing staff who can nurse these chronic sick efficiently are competent to nurse any case. They are excellent material for the training of nurses in their profession, and our V.A.D.s would be all the better for this opportunity of relieving trained nursing staff of this arduous and important national duty.

I would not stress the economics of keeping chronic sick in urban areas at the present. This is a question which should have been settled in the pre-war period. It is so full of difficulties that all discussions seem to have led to no settlement. It is like playing with nettles. The old adage "Grasp a nettle and it will not sting" seems to be an appropriate one to this subject. The cost per patient in our large hospitals and institutions in urban areas varies from £3 to £6 a week. This in itself is a problem calling for serious thought. Whereas the healthy wage-earner is expected to pay his rent and rates and bring up his family on an average of £3 a week, the expense of maintaining the chronic sick is one which economists might well delve into. My view is that, economically, the present way of dealing with chronic sick is impossible, and will sooner or later have to be handled drastically. There are many interpretations of the term "chronic sick," and indeed each case has to be considered individually. Many of the patients are senile, others suffer from permanent or chronic disabilities. However, this is not the occasion to discuss this aspect.

The need now is for "evacuation" (not to other industrial areas), making use of all available accommodation in quiet rural areas where the majority of these persons can end their days away from the noise of gunfire and bombs and the fear of impending disaster. Above all let them not be evacuated to institutions where the stigma of "workhouse" still prevails. The "workhouse" dies hard, and this indignity would merely add to their mental anguish and troubles. Our care of the chronic sick in the past has been an example to all civilized countries. Let us not fail in our duties in these critical days.—I am, etc.,

June 12 "DE SENECTUTE."

Treatment of Injuries of the Fingers

SIR,—May I express my complete agreement with Mr. J. B. Oldham's letter (June 14, p. 906) and in particular with the functional and cosmetic advantages of amputation through the metacarpal shaft where this is indicated. There is, however, one further point which should be stressed—namely, that the greater the injury to the hand as a whole the greater the relative advantages of conservative treatment become. One crippled finger in an otherwise perfect hand is a "lame duck" which hinders the rest. The same finger in a damaged hand may contribute its full share to the use of that hand.

A case of mine may illustrate this. Six years ago a shoe operative had the misfortune to have his left hand caught in a press. The flexor sublimis tendons to all four fingers were severed, and the flexor profundus tendons to the middle and little fingers as well, across the proximal phalanges. I sutured each with a single stitch of fine catgut and excised and repaired the wounds. The hand, wrist, and elbow were kept in flexion. He had no later treatment except the movements that he could do himself; in these he was intelligent and persevering. I saw him a few days ago, and, having this correspondence in mind, asked him if he thought I had been in error in failing to amputate his fingers. His reply was appropriate, but cannot be given verbatim. I gather that he is quite satisfied with things as they are. He can flex his hand as a whole, and the index and ring fingers separately. With it he can do a full day's work at his old job, and has done so ever since his recovery from the injury. He also cultivates his garden and an allotment in his spare time. Admittedly he does not have to do fine and accurate work with the damaged hand, but he can do all that he wants to do, and much more than he could have done without his fingers.—I am, etc.,

Glastonbury, June 16. R. M. AINSWORTH.

Subcutaneous Ligature of Veins

SIR,—Dr. H. S. Russell's reply (June 7, p. 870) to the critics of his operation for varicose veins of blind ligature somewhere in the thigh, followed by injections of sodium morrhuate, constrains me to add my deprecation of this dangerous and inefficient procedure. I do so because sodium morrhuate is of variable chemical composition, and enough sudden deaths and anaphylactic collapses have been reported following its use to warrant its final abandonment for the injection of varicose veins, especially as there are many other safer and more effective substances (quinine and urethane, sodium salicylate 30%, quinine and urethane followed by lithocaine). Sodium *morrhuate at best is a poor sclerosing agent.*

I have been interested in the operation of simultaneous ligature and injection of gross varicose veins since 1932, and have performed the operation between two and three hundred times A follow-up has shown that if any ligature is placed lower than the actual union of the internal saphenous vein with the femoral vein it will be followed by recurrence in a high percentage in a period of three months to three years. J. B Oldham's experience corresponded with this. I entirely agree with Mr. N. L. Eckhoff's letter (May 10, p. 729), pointing out the weakness of Dr. Russell's method. I would condemn it as being dangerous to patients, of doubtful service to their need, and likely to bring disrepute to the good name of surgery for varicose veins.—I am, etc.,

London, W.1, June 10 HAROLD DODD.

"Egyptian Tummy"

SIR,—"Gippy tummy" differs clinically in no way from the so-called "Madeira fever" or "Riviera gripes." Colic, diarrhoea, often fever and vomiting present a picture of severe enterocolitis or gastrocolitis. Heat, flies, and filth seem to be the prerequisites of the attack, which is represented in this country by its summer diarrhoeas and food poisonings.

Both in Egypt and Madeira one's chances of dodging the complaint are increased by avoiding uncooked food (except peeled fruit), milk, and water from the tap. I share Sir James Barrett's view (June 14, p. 906) that this is an infective disease which may be influenced, but certainly not caused, by climatic changes. That causative organisms have not been isolated is partly due to lack of enthusiasm to find harmful microbes in expensive winter health resorts (the visitor is always assured that he has been eating too much fruit); partly to lack of facilities for investigation of fresh stool passed early in the attack; and partly to the inherent difficulties of isolating the organism which apply equally to food poisoning in England as elsewhere.—I am, etc.,

London, W.1, June 13. A. H. DOUTHWAITE.

Abdominal Pain after Opium

SIR,—I have read with great interest the account given by Col. H. L. Tidy (June 7, p. 870) of the experiments carried out at the Mayo Clinic to show the effects of morphine on the biliary ducts and the sphincter of Oddi. Some time ago in the *Journal* I drew attention to these experiments in an article on the exploration of the common bile duct for stone,[1] and, if I mistake not, the present discussion was initiated by Dr. J. B. Williamson in a letter with reference to this article—a letter in which he recorded the adverse effect of morphine on one of his patients who had undergone cholecystectomy.

It is to be noted that in the cases investigated at the Mayo Clinic the gall-bladder had been removed, and there is evidence to show that in such cases the sphincter of Oddi alters somewhat in function. Col. Tidy recalls that when a meal is taken the gall-bladder contracts, the sphincter of Oddi dilates, and bile runs into the duodenum. Doubilet and Colp[2] found that after cholecystectomy neither an ordinary meal nor a fatty meal had any influence on the sphincter of Oddi, the sphincter in one case remaining closed for not less than forty minutes after a fatty meal. Furthermore, it must be remembered that all these experiments were carried out on patients who had suffered from pathological conditions of the biliary tract and who were still probably suffering from spasm of the sphincter of Oddi. There is no evidence in the notes of the cases to show that dilatation of the sphincter had been carried out at operation—a step advocated by surgeons generally, including some of the surgeons at the Mayo Clinic.[3] In fact Walters and others[4] suggest the use of morphine as a diagnostic measure in cases with a post-cholecystectomy syndrome—an attack of pain following the administration of morphine being strongly suggestive of sphincter spasm or overlooked stone in the common duct. I have not known of any case of biliary colic following dilatation of the sphincter, and although I have not carried out any investigations to show the effect of morphine on the dilated sphincter, it happened that in one of my cases omnopon (52% morphine) was inadvertently given before cholangiography; this drug did not seem to interfere with the free entry of the opaque medium into the duodenum.

Whether morphine has any effect on the intact or healthy biliary apparatus is another question. Cases are known where repeated administration of morphine gives rise to clay-coloured stools, but not to biliary colic, and the conclusion to be drawn from the investigations already mentioned is that biliary colic following morphine is highly suggestive of a pathological condition of the biliary apparatus.

Biliary colic, however, will hardly explain the abdominal symptoms in every case in which the patient displays an idiosyncrasy to morphine. It would not seem to be the answer to the remarkable series of cases published by Mr. Winsbury White (March 22, p. 461), or the experiences recorded by Drs. Stephen Falla (May 17, p. 763) and Marcus Liddle (May 3, p. 688). From the clear account given by these observers severe spasm or colic of some other part of the gastro-intestinal tract would appear to be the cause of the untoward symptoms. Further experiments carried out at the Mayo Clinic support the views of Dr. Falla. McGowan and others[5] showed by *x*-ray that morphine produces spasm of the duodenum, and similar effects in the large intestine following morphine were observed by Jackman and Bargen.[6] The latter observers found that atropine was not very helpful as an antispasmodic; traesentin was much more effective; best of all was spasmalgin (papaverine compound).

Some doctors are still very reluctant to give morphine after abdominal operation for fear of causing ileus, but a great many surgeons believe that the increased tone and peristalsis produced in the small intestine by the drug prevents rather than gives rise to ileus. In fact it is the practice of some surgeons to combine morphine with prostigmin *before* abdominal operation in an effort to forestall this complication.—I am, etc.

London, W.1, June 16. MICHAEL J. SMYTH.

REFERENCES
1 *British Medical Journal*, 1941, 1, 111.
2 *Surg. Gynec. Obstet.*, 1937, 64, 622.
3 Ibid., 1936, 63, 417.
4 Collected Papers of the Mayo Clinic, 1937, 29, 32.
5 Ibid., 1937, 29, 55.
6 Ibid., 1938, 30, 73.

Vitamin C from Rose-hips

SIR,—Dr. K. E. Barlow (May 24, p. 797) draws attention to the value of rose-hips as a source of vitamin C, with a reference to their use in Denmark. Dr. Barlow is right, as wild rose-hips are used all over the Continent for this purpose, and the Germans planted rose-hips along their new country roads, as well as using now the hips of the conquered Eastern European countries for this purpose.

The *Annales Paediatrici* (Basle), in May, 1939, published an article on this matter entitled "Der C-Vitamin-Gehalt verschiedener Hagebuttenspeisen," by Drs. Gedda and Kjellberg (Vol. 153, No. 2), on work done at the Children's Hospital in Gothenburg, under Prof. Arvid Wallgren. Work has also been done in Scotland by Miss Andross of the West of Scotland Domestic Science College on the preparation and popularization of wild-rose soups. During the past two years I have been collecting and translating Continental recipes and testing and adapting them for easy use in this country. The suggestion that wild rose-hip preparations should be used in welfare centres was put before the Maternity and Child Welfare Section of the Society of Medical Officers of Health in summer 1940, and welcomed as a possibility, if arrangements could be made for preparation and delivery to the centres. During last year negotiations were carried out between the Women's Institutes and several other organizations by members of the Food Education Society and myself, with regard to the organization of parties for picking and preparation of hips. Prof. Drummond, in replying to questions concerning the preparation of rose-hips, writes: "The Eastern hip is a much larger and juicier one than that obtained in this country. Nevertheless, we should do all we can by

local organization to make use of foodstuffs of the woods and hedgerows."

There are also difficulties in the making of hip preparations here which need to be overcome; notwithstanding this fact, all the hip preparations which I finally succeeded in making last year and the year before from local wild hips were attractive in appearance and of a delightful flavour. In one instance where hips were put before a children's party and put on the table without a word with other jams, it was the hip-jam pot which was emptied first.

I am enclosing a leaflet which was prepared last year and which gives the recipes that have been tested. I agree with Dr. Barlow that if official recognition could be obtained for wild rose-hips, a most valuable addition would be gained for the nation's sources of vitamin supply.—I am, etc.,

Hedgerose, Buckland Common, Tring, Herts, May 29. CLAIRE LOEWENFELD.

Sulphapyridine in Subacute Bacterial Endocarditis

SIR,—Dr. J. G. Macleod (June 21, p. 927) contrasts the results in cases treated with sulphapyridine and heparin with those in cases treated with sulphapyridine without heparin. The former method of treatment has as yet justified no hope, but by the latter a few hopeful results have been obtained. These, however, should be contrasted with results without the use of either heparin or any sulphonamide—for instance, with that in a case which I recently described (*Lancet*, 1941, I, 630), in a portion of the cases referred to by J. A. Capps (*Ann. intern. Med.*, 1939, 13, 280), those of M. Haines (*Lancet*, 1941, I, 681), and those of E. Libman, in his pioneer observations of 1913 (*Amer. J. med. Sci.*, 146, 625). In spite of this last class, though remarkable remissions have occasionally been observed—I have heard of one case in which there may actually have been recovery, as the patient was lost sight of after remarkable improvement—I am nevertheless in favour of trying sulphapyridine, because without treatment, if a stage is reached in which all signs of active infection disappear and remain absent, the damage already done (notably results of cerebral embolism) is likely to be already so great that one is not justified in speaking of *recovery from the disease*, though one can suppose there has been recovery from the infection.—I am, etc.,

London, W.1, June 21. F. PARKES WEBER.

Medical Planning Commission

SIR,—At the first meeting of the Medical Planning Commission Lord Dawson of Penn is reported (May 17, p. 759) to have said: "The practice of medicine in all its branches must become increasingly institutional." What, I ask myself, are the full implications of this statement? Does it imply that more and more patients will be treated in hospital, or does Lord Dawson include his primary centre, which the late Sir James MacKenzie considered, in my opinion quite wrongly, as almost the only commendable part of the scheme set forth in a notable Cavendish lecture?

Such institutional medicine as can be carried out in a fully equipped primary centre would inevitably tend to decrease the subsequent need for treatment inside a hospital. Shall we never seek to implement our oft-expressed opinion that the general practitioner is the backbone of the profession by giving him as easy access to the means of early diagnosis and treatment as has the consultant, general or specialist? Such possibility of early diagnosis and treatment should be available to every member of the community irrespective of the individual's means, and the Medical Planning Commission might well make such provision its first consideration. No medical scheme without it can be really satisfactory.—I am, etc.,

London, W.8, June 16. HAROLD H. SANGUINETTI.

R.M.B.F.: Loss in Income of £1,292

SIR,—The above heading sufficiently explains the reason for this letter. This loss in annual income is very largely due to the fact that many of our regular subscribers practising in towns heavily bombed have suffered serious financial loss and have had to reduce or cancel their subscriptions. Their number may well increase before the war is over.

Everybody knows the beneficent work of the Royal Medical Benevolent Fund in helping those members of our profession, their wives, widows, and children, who are living in straitened circumstances, and who, in many cases, are quite unable through age and infirmities to do anything to help themselves. The committee has done everything possible to cut down overhead charges. Administration is carried out with a reduced staff in less costly offices. Expensive annual reports have been abolished, and one way and another we have managed to effect a considerable saving in our annual expenditure.

Unfortunately, however, this is not nearly enough, and if the work is not to be seriously crippled we must get more help. We need donations to meet the present emergency, and especially we need many more annual subscriptions. Poverty is hard to bear under any circumstances, but when accustomed help is curtailed and prices are soaring—as is the case to-day—then the position may well become desperate.

Here is a passage from a letter which reached me the other day: "I am sending you a donation as a thank-offering for the fact that circumstances have placed my life in a spot where there is less danger from enemy action than is the case with my brother practitioners." I appeal to all your readers who feel that they are in similar fortunate circumstances to come forward at this critical time to help in carrying out our duty to our distressed colleagues. Contributions should be sent to the Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15, and will be gratefully acknowledged.—I am, etc.,

ARNOLD LAWSON,
June 18. Chairman of the Committee of Management.

Obituary

JOHN RHODES DICKSON, O.B.E., M.B., C.M.

News has been received of the death of Dr. John Rhodes Dickson of Port of Spain, who has been a member of the British Medical Association for thirty-three years and was appointed honorary secretary of the Trinidad Branch in 1932.

Dr. Dickson was a medical student at the University of Edinburgh and graduated M.B., C.M. in 1889. He took the D.P.H. of the English Conjoint Board in 1899, the D.T.M. of Liverpool in 1905, and the B.Sc. (Public Health) of Edinburgh in 1909. After long service as deputy surgeon-general and medical inspector of health for Trinidad and Tobago he became medical and health officer to the Imperial College of Tropical Agriculture, Trinidad. He represented his Branch at the Annual Meetings of the B.M.A. at Dublin in 1933 and at Oxford in 1936.

At its last meeting the Trinidad Branch Council passed a resolution expressing sorrow at Dr. Dickson's death and condolence with his family, and the president, Dr. Eric de Verteuil, in moving the vote, paid tribute to his memory: "With the passing of Dr. Dickson," said Dr. de Verteuil, "we have lost an esteemed and respected colleague, a devoted and conscientious secretary, and above all a true, fast, and sincere friend. In this Council and among us here now, we may, I am sure, claim to have some of his most intimate, sincere, and genuine friends—friends who were able to value at their true worth his remarkable qualities of mind, character, and devotion to duty and to the public good, the richness of which appeared to grow brighter and to become more accentuated as the years rolled by. Dr. Dickson was fortunate in retaining to the end a full degree of his mental vigour, his gentle yet dignified bearing, and his cheerful and lovable nature. And we too in turn were blessed in sharing this good fortune."

Dr. GEORGE HENRY DUPONT, who retired in 1938 after having held the position of medical officer of health and school medical officer for Twickenham for twenty-eight years, died on June 11. He studied medicine at the University of Edinburgh, graduating M.B., C.M. with honours in 1893, and proceeding to the M.D. in 1898; four years later he took the D.P.H. of the English Colleges. In addition to his official posts in the Borough of Twickenham Dr. Dupont had been consulting physician to St. John's Hospital, Twickenham, and consultant to the Metropolitan and City Police Orphanage until its closure. He was a Fellow of the Society of Medical Officers of Health, a member of the Royal Sanitary Institute, and author of the Health Reports for Twickenham from 1910 to 1938, when he was made consulting M.O.H.

The Services

NAVAL AWARDS

Surgeon Commander John Joyce Keevil, R.N. (H.M.S. *Illustrious*) has been awarded the D.S.O. for great ccurage and devotion to duty in the face of enemy air attack.

Surgeon Captain J. Martin, R.N. (ret.) has been awarded a Greenwich Hospital Pension of £50 a year in the vacancy caused by the death of Fleet Surgeon J. H. Acheson, R.N. (ret.).

Temporary Surgeon Lieut. Thomas Tibbott Davies, R.N.V.R. (H.M.S. *Illustrious*) has been mentioned in dispatches.

AUXILIARY R.A.M.C. FUNDS

The annual meeting of the members of the Auxiliary R.A.M.C. Funds will be held at 12 noon on Friday, July 11, at 11, Chandos Street, Cavendish Square, W., when the annual report and financial statement for the year ended December 31, 1940, will be presented and the officers and committee for the current year elected.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL ARMY MEDICAL CORPS

Missing

Captain Nicolas Shtetinin Seaford.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examination indicated:

FINAL M.B.—*Part I (Surgery, Midwifery, and Gynaecology)*: R. M. Archer, J. D. Atwell, R. C. Barclay, D. V. Bateman, K. F. C. Brown, L. J. H. Burton, H. Butler, W. H. Chase, R. E. W. B. Comerford, E. D. Cullen, P. M. Daniel, B. Dansie, F. M. P. Eckstein, E. J. S. Evans, C. L. Grandage, R. E. A. S. Hansen, D. V. Harris, A. Holmes-Smith, E. B. Jarrett, R. Jenkins, J. S. Johnstone, K. H. Lim, L. R. McLaren, H. L. McMullen, J. M. Mungavin, P. H. Nash, T. P. Pattinson, A. G. E. Pearse, G. E. Pinkerton, G. K. Riddoch, P. Sainsbury, J. L. S. Smith, A. G. Stansfeld, J. H. Tasker, H. D. Teare, D. E. Thompson, D. G. Vulliamy, A. Waymouth, H. G. Wolskel. *Women*: H. M. Comely, A. Davies, D. H. King, M. Redfern Davies.

UNIVERSITY OF GLASGOW

William John Brownlow Riddell, M.D., D.O.M.S., has been appointed to the Tennent Chair of Ophthalmology from October 1, in succession to Prof. A. J. Ballantyne, who retires under the age limit.

Medical Notes in Parliament

Mental Hospital Staffs

On June 17 Mr. SORENSEN asked the Minister of Health whether he was aware of the increasingly serious situation in mental hospitals through the withdrawal of male nurses to the Forces, and if he was considering the possibility of an extension of the Essential Works Order to cover the need of these hospitals. Miss HORSBRUGH replied that as regards withdrawal of male nurses for the Forces, no change had been made in the Schedule of Reserved Occupations. Male nurses over 30 were not called up, and those under 30 were called up only for service in their profession. Applications for deferment of individuals received full consideration by the Minister, and in suitable cases recommendations for deferment were made to the Ministry of Labour and National Service. The Essential Works Order did not affect military service, but the Minister had under consideration the question whether an order of similar effect should be made in respect of mental hospitals.

Committee on Medical Man-power

Sir Francis Fremantle was informed by Mr. ERNEST BROWN on June 19 that Mr. Brown, the Service Ministers, and Mr. Johnston had decided to set up a committee to investigate, in the light of the recommendations of the committee presided over by Sir Arthur Robinson, what further steps could usefully be taken to secure the utmost economy in the employment of medical personnel in His Majesty's Forces, the Emergency Hospitals Scheme, and the Civil Defence Services, and all other medical services, including general practice. This committee was to report from time to time what should be the allocation between these services of the available medical personnel. It would begin its work at once. Its members were: Mr. Geoffrey Shakespeare (Parliamentary Under-Secretary for the Dominions), chairman; Prof. R. M. F. Picken, M.B., D.P.H.; Sir Alfred Webb-Johnson, F.R.C.S.; J. Crighton Bramwell, M.D., F.R.C.P.; Prof. Sydney Smith, M.D., D.P.H.; J. A. Brown, M.D.; William Malcolm Knox, M.B., Ch.B.; and medical representatives of the Admiralty, the War Office, and the Air Ministry. In addition the following agreed to be closely associated with the work of the Committee: Sir Charles Wilson, M.D., P.R.C.P., Sir Hugh Lett, Bt., P.R.C.S., and H. S. Souttar, C.B.E., M.D., F.R.C.S. (chairman of the Central Medical War Committee).

Mr. RHYS DAVIES asked if the committee would inquire into the difficulties of panel practice in National Health Insurance. Mr. BROWN replied that the terms of reference were wide.

Medical Advisory Committees

Mr. GROVES asked on June 19 how many medical committees, advisory or executive, were referred to by Mr. Brown in the national emergency; how, when, and by whom they were appointed; and what were their constitutions. Mr. BROWN gave the following list: The Central Medical War Committee and Advisory Emergency Hospitals Medical Service Committee, the appointment and constitution of which had been set out in October and December, 1939, and February, 1941, respectively; Medical Advisory Committee on Rehabilitation, consisting of a number of specialists on this subject invited by the Minister in November, 1940, to advise the Director-General, Emergency Medical Services, from time to time on the rehabilitation of patients under the Emergency Hospitals Scheme; Standing Committee on Physiotherapy, consisting of medical practitioners with special experience of this treatment, selected in July, 1940, by the Minister's consultant advisers in collaboration with official representatives of the specialists concerned, to advise the Director-General, Emergency Medical Services, on the facilities required for this treatment in hospitals under the Emergency Hospitals Scheme; Lord Horder's Committee on conditions in air-raid shelters (with particular reference to health) appointed on September 14, 1940, jointly by the Minister of Health and the Minister of Home Security, and consisting of Lord Horder as chairman, a senior medical officer of the Ministry of Health, the chief engineer of the Ministry of Home Security, and two lay representatives of voluntary organizations.

Medicine Stamp Duties

Captain CROOKSHANK said on June 19 that before the announcement of the abolition of the Medicine Stamp Duties their yield in a full year was estimated to be £800,000. The yield of the Purchase Tax on prepared drugs and medicines might in a full year be of the order of £3,000,000. Sir KINGSLEY WOOD on the same date told Mr. Horabin that he would not consider the introduction of a Bill to legalize the administration of the Medicine Stamp Duties. The legal action brought by Messrs. Woolworth merely illustrated the difficulties to which the administration of these antiquated Acts continually gave rise. Captain CROOKSHANK said on June 18 that before the decision was announced to repeal the Medicine Stamp Duties, proposals were considered for a revised method of taxation suggested by the Proprietary Association of Patent Medicine Manufacturers.

Mr. WHITE suggested on June 19 that widespread advertising of patent medicines, often with an appeal to fear, led large numbers of people to treat their own ailments instead of using the medical services available under the National Health Insurance Acts. Mr. BROWN said he had no specific evidence than any large number of insured persons treated their own ailments instead of consulting their insurance doctors. This was among the matters considered before Sir Kingsley Wood announced the decision to repeal the Medicine Stamp Duties.

National Health Insurance.—On June 10, Mr. ERNEST BROWN told Captain Plugge that the possibility of securing economy by the substitution of a yearly health and pensions insurance contribution

card for the two half-yearly cards now in use had been carefully considered from time to time, and was discussed with the Consultative Council on National Health Insurance shortly after the outbreak of war. After weighing the arguments for and against the suggestion, the Council unanimously decided that they could not then recommend its adoption, but he would certainly see that the matter was considered afresh in the light of present circumstances. He pointed out, however, that a yearly card would cover the period of a contribution year, running from July to June, and that the change, if found practicable, could not take effect until July, 1942.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The majority of the principal infectious diseases have declined somewhat in England and Wales during the week, with the notable exceptions of dysentery and enteric fever. In Scotland also both diseases are abnormally prevalent, especially enteric fever. About this time last year dysentery was gaining a footing which it established for the three succeeding months of the year. Speed in tracing cases and carriers, strict control over the handling of foodstuffs and instruction in the observance of the elementary rules of hygiene are the golden rules in the prevention of dysentery as well as of enteric fever. Where the communal and individual risk is large, recourse must be had to active immunization.

Scarlet fever advanced very slightly in England and Wales and considerably in Scotland; in both cases it has exceeded the 1940 level. During the last three weeks cerebrospinal fever has declined slightly in England and Wales. Of the 254 cases notified only 28 were in respect of non-civilians.

Dysentery

Despite the increase in notifications, only fifteen administrative areas were affected compared with twenty in the previous week. Lancaster and Surrey remain the chief centres, but an outbreak has appeared in the West Riding of Yorkshire, where last week only one case (in Sheffield) was encountered. More than 3 cases were recorded in the following areas: Lancaster 38 (Blackburn 5, Liverpool 1, St. Helens 1, Blackburn R.D. 5, Warrington R.D. 4, Whiston R.D. 13); Surrey 19, all in Coulsdon and Purley U.D.; Yorks, West Riding, 17 (Bradford 7, Mexborough U.D. 1, Shipley U.D. 9); Chester 5, in Macclesfield M.B.; Hertford 4 (Watford M.B. 3, Hemel Hempstead R.D. 1); London 4 (Kensington 1, Wandsworth 3); Stafford 4, in Uttoxeter U.D.; Caernarvon 4 (Caernarvon M.B. 3, Gwyrfai R.D. 1). In Scotland more than one-half the cases occurred in the burghs of Aberdeen 14, and Dundee 10. Of the remaining ten areas affected, more than a single case was reported only in Aberdeen County 8, Glasgow 3, Renfrew County 3.

Enteric Fever

Enteric fever has increased in geographical distribution as well as in numbers since the preceding week. Twenty-five areas—an increase of five—were involved. Three adjacent counties supplied more than half the total for the whole country—namely, Warwick 23 (Birmingham 14, Coventry 4); Stafford 15 (Smethwick 6, Walsall 3, Wolverhampton and West Bromwich 1 each, Amblecote U.D. 2, Brierley Hill U.D. 2); Worcester 15 (Halesowen M.B. 2, Kidderminster M.B. 7, Stourbridge M.B. 1, Malvern U.D. 1, Bromsgrove R.D. 4). Other areas reporting more than 3 cases were: Lancaster 8, Middlesex 8, London 6, Nottingham 4. In Scotland over three-quarters of the cases notified, which were all of paratyphoid B fever, occurred in Dundee; the remainder were in the counties of Fife 3, Perth and Kinross 2, Sutherland 2, Ayr 1, Lanark 1, Moray and Nairn 1, Renfrew 1, and Glasgow 1.

Cerebrospinal Fever

Despite the recent decline in the incidence of cerebrospinal fever, it remains widespread in distribution. Although forty of the sixty-five administrative areas are involved, in only five were more than 10 cases notified during the week—namely, Lancaster 46, Yorks, West Riding 33, Glamorgan 21, London 16, Warwick 13. In Scotland the disease is less widely distributed, affecting twenty out of the fifty-eight counties and burghs. Only in Glasgow 22, Ayr County 8, and West Lothian County 4 were more than 3 cases notified.

No. 22

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 31.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	(b)	(c)	(d)	(e)	1940 Corresponding Week (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	254	16	56	2	4	275	17	63	1	8
Deaths		—	5				2	8		
Diphtheria	569	42	182	23	21	766	36	253	30	30
Deaths	17	1	6	2	1	13	—	8	—	—
Dysentery	113	4	45	—	—	36	6	34	—	—
Deaths			—	—	—			1	—	—
Encephalitis lethargica, acute	3	—	1	—	—	2	—	1	—	—
Deaths		1	—				—	3		
Enteric (typhoid and paratyphoid) fever	101	6	45	7	—	35	4	7	3	—
Deaths	2	—	—	—	—	3	1	—	1	—
Erysipelas			71	10	6			41	4	5
Deaths		—	—				—	1		
Infective enteritis or diarrhoea under 2 years										
Deaths	24	1	5	6	4	31	—	4	3	3
Measles	13,031	335	142		6	7 842	35	1,334		78
Deaths	11	1	2	—	—	4	—	2	—	1
Ophthalmia neonatorum	32	5	18		—	105	8	26		—
Deaths										
Pneumonia, influenzal*	1 161	49	11	3	4	644	34	4	15	8
Deaths (from influenza)	24	2	2	—	—	19	7	—	—	—
Pneumonia, primary			251	14				266	19	
Deaths		38		12	5		25		1	12
Polio-encephalitis, acute	—	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	5	2	1		1	4	1	1	1	—
Deaths		—	—				—			
Puerperal fever	4	4	23	—	—	5	5	18	2	—
Deaths		—					—			
Puerperal pyrexia	122	9	17		2	157	12	16		—
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,114	66	149	54	17	1,079	57	132	52	96
Deaths	1	—	1	—	—	1	—	—	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus	—	—	—	—	—	—	—	—	1	—
Deaths			—	—	—			—	—	—
Whooping-cough	4,121	130	440		8	633	6	63		17
Deaths	29	3	16	—	—	2	—	—	3	—
Deaths (0-1 year)	329	22	66	46	10	294	43	64	27	26
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,613	604	654	195	119	4,364	733	604	204	160
Annual death rate per 1,000 persons living			14.2	12.9	10.4			12.2	13.6	14.6
Live births	5,110	386	935	441	206	7,443	1,130	1,023	431	294
Annual rate per 1,000 persons living			19.0	29.3	18.0			20.7	28.8	25.8
Stillbirths	186	16	36			249	28	40		
Rate per 1,000 total births (including stillborn)			37					38		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Medical News

The National Association of Maternity and Child Welfare Centres and the National Association of Probation Officers, London and Home Counties Branch, are holding a joint meeting on Monday next, June 30, at 2.30 p.m., in the Hall, at 117, Piccadilly, London, W.1, when Miss J. E. R. Kennedy, probation officer, Willesden Police Court, and Dr. Leslie Housden, chairman, Mothercraft Teaching Subcommittee, will speak on "The Bearing of Mothercraft Teaching on the Prevention of Juvenile Delinquency."

About a hundred doctors who saw service in hospitals, at aid posts, rest centres, and incidents during the raids on Clydeside met in Glasgow recently under the chairmanship of Sir A. S. M. Macgregor, medical officer of health for the city, to discuss and exchange experiences. Dr. James Dunlop, the chief A.R.P. medical officer, described the first-aid and ambulance services in action, and Dr. A. B. Walker, hospital officer, the reception and distribution of casualties, the calling out of reinforcements, and the emergency evacuation of hospitals. Prof. C. F. W. Illingworth discussed briefly the nature of the injuries, the treatment, the indications for morphine, and the work of a large hospital where the windows had been destroyed early in the raid. Other speakers were Prof. J. A. G. Burton, Mr. James Russell, Mr. G. H. Stevenson, Dr. Hunter (medical officer of health for Clydebank), and several doctors attached to first-aid posts. Among the points emphasized were the need for better protection for first-aid posts, and for shelters at posts to be heated and lighted artificially, and the value of senior medical students in the work of a casualty unit. Sir Alexander Macgregor said that the casualty scheme had worked well. Some re-allocation of doctors should be made to minimize the travelling distance to first-aid posts, and more doctors should be available to go to incidents. There had been many examples of great coolness and courage on the part of doctors and nurses.

The name of Dr. George Seymour Swan, surgeon, Birkenhead, has been brought to notice for brave conduct in civil defence.

The February issue of the *Journal of the Indian Medical Association* is a conference number devoted to the proceedings of the 17th All-Indian Medical Conference held at Vizagapatam from December 27 to 29, 1940.

Vitamin preparations containing added medicaments are subject to purchase tax unless the proportion of the medicament is so small that it has only a nutritional effect.

In the Soviet Union there are at present 117,000 doctors to about 200 million inhabitants.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A HOUSE, TAVISTOCK SQUARE, W.C.1.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be addressed to the Secretary.

TELEPHONE No.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES: EDITOR, *Astiology Westcent, London;* SECRETARY, *Medisecra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Urticaria

"H.S." (Carlisle) would be glad to have any suggestions for treating a stubborn case of urticaria in a woman of 24. She has been a sufferer for several years and all the usual remedies have been prescribed without any effect.

Post-herpetic Neuralgia

DR. N. S. FINZI writes: With reference to the two recent inquiries about the treatment of post-herpetic neuralgia, I beg to inform you that treatment with very small doses of *x* rays to the posterior ganglia which are affected is a specific. The only case I have known to fail was one where the doses used were much too large and which was not treated by myself. I have had personal experience of the benefits of this treatment. The condition is made worse for a few hours and then steadily improves. If necessary the treatment is repeated at intervals of four to seven days.

DR. BASIL KIERNANDER (Oxford) writes: With reference to "M.B., B.S.'s" query about the above (June 7, p. 876), it is always worth trying a course of low-intensity, local, short-wave therapy to the painful area daily for a few weeks, as about 50% of the patients definitely find relief from it, in my experience. There is no method of differentiating beforehand, so far as I know, between the cases which will and which will not respond to treatment.

Income Tax

Purchase and Sale of Practice on Accepting Service Appointment

"N.D." retired on pension from one of the Services in 1937 and bought a practice. In September, 1939, he sold the practice and accepted a Service appointment. Can he claim any relief?

* * "N.D." is entitled to pay tax for 1937-8 to 1939-40 on the amount of his actual income; but he is not entitled to deduct any loss he may have incurred in taking over and giving up the practice, as such is a loss of capital.

Apparatus Prohibited from Use

"Diatherm" owns some high-frequency apparatus which he is prohibited from using under the recent Order. What income tax allowance can he claim?

* * As regards depreciation, the income tax allowance is, strictly, applicable only to diminished value by reason of *wear and tear,* and unused apparatus does not qualify for the allowance. But we apprehend that a concession might be made in the special circumstances. As regards loss of income, if the total earnings fall by more than 20% as compared with the previous year, "Diatherm" can claim to be charged on the amount of the profits for the actual year. Apart from this special war-time provision, however, in the long run the loss of income will be allowed for in that "Diatherm" will presumably in the end pay tax only on the amount of his profits taking one year with another.

Liability on Service Pay

"Lieut." gives particulars of his pay and circumstances and asks how he stands as regards income tax.

* * The amount of tax payable by him for 1941-2 is apparently about £58. It is not unlikely that monthly deductions in excess of the current sums are being made pending calculation of the actual amount due for the year. (Presumably our correspondent has made his return for the year claiming the appropriate allowances.)

LETTERS, NOTES, ETC.

Bee-sting Anaphylaxis

"D.S.O., M.D." writes: I doubt if anyone who has suffered from the effects of a bee sting in an acute form has ever described his symptoms, so I thought my experiences would interest some of my fellow members. On June 12, 1941, about 8 p.m., I was stung by a bee on the left ear. In a few moments I felt tingling in the head, neck, back, and the palms of the hands, and then all over the body. My eyes became "gritty" and the conjunctival vessels dilated. My face became very swollen. Next a marked urticarial rash developed all over my body and extremities. My lips were swollen and white; the rest of my face of a dusky blue colour. My pulse became fast and full and occasionally irregular, my breathing somewhat difficult. There were beads of perspiration on my forehead. This condition lasted for about half an hour. I was thirsty and drank about 1½ pints of soda water. Gradually the condition passed off, and in about two hours had practically subsided. I slept well during the night, but next day felt somewhat "washed out," but was able to do my work. Adrenaline was got ready, but as the condition was passing off was not used. I ought to add that in previous years I have had many bee stings, having kept bees for years, but never had a condition of anaphylaxis before. I am 69 years of age, and years ago had serum injections for prophylactic purposes on several occasions—antityphoid, antitetanic, etc.; also serum for diphtheria.

MESSRS. E. and S. LIVINGSTONE inform us that the premises occupied by their binders have been destroyed by fire, with the whole of the contents, which included all work in progress and a large reserve of bound stock of their publications. They are doing everything in their power to replace the more important books and those in constant demand, but some of these will be out of print for some time to come, and medical men interested in their publications are meanwhile asked to make allowances.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY JUNE 28 1941

THE INSURANCE CAPITATION FEE

INSURANCE ACTS COMMITTEE OF THE B.M.A.

A meeting of the Insurance Acts Committee of the B.M.A., principally to discuss the matter of the insurance capitation fee, was held on June 12, under the chairmanship of Dr. E. A. GREGG. A number of resolutions from Panel Committees and B.M.A. Divisions urging that the claim for an increased fee be pursued were before the Committee.

A letter from the Ministry of Health dated May 31 stated that the Minister was not able wholly to agree with the figure of 5½d. as representing the cash value of the enhanced practice costs, but, in view of the introduction of legislation extending the insurance remuneration level from £250 to £420 per annum and the consequential increase of between 400,000 and 500,000 in the total number of insured persons entitled to medical benefit, he was prepared, as from the date of operation of the proposed legislation, if approved by Parliament, to agree to a consolidated increase of 6d. in the capitation rate, being an undetermined amount in respect of increased practice costs rounded off to take account of the new class of entrants into medical benefit. Several members of the Committee took exception to the fact that the Association had not been consulted by the Ministry as to the bringing in of the new class of insured persons, as was done when the level was raised from £150 to £250 during the last war.

The Chairman considered that a large proportion of practitioners would not seriously object to the inclusion of the new class provided that the remuneration resulting from such inclusion was comparable with that received in respect of the same class at the present time. The Minister seemed to recognize that a higher remuneration should be payable for the new class, and had suggested a moiety addition to the amount to which he was prepared to agree as representing the increase in practice expenses—the increase being spread out over the whole of the insured class—namely, the nineteen millions already insured and the half-million to be brought in. On this basis, if the 6d. offered by the Minister was regarded as 5½d. in respect of increased practice expenses, and ½d. in respect of the new entrants, the increase for the new class worked out at 1s. 8d. He thought the Committee should register a protest against the manner in which the new arrangement had been introduced, without sufficient opportunity being given to the Committee to consider the matter and, if thought necessary, to consult the profession.

A member pointed out that as it had been stated that the raising of the income limit from £250 to £420 was a recognition of the increased cost of living, doctors also should be entitled to some consideration in that respect, and this gave the Committee the opportunity to reopen the question of the capitation fee generally as relating to all insured persons. Other members supported this suggestion, and the opinion was strongly voiced that new classes should not have been brought into insurance without an opportunity being given to representatives of practitioners of raising the question of the adequacy of the capitation fee as related to this new class. It was also pointed out that in accepting the same capitation fee for this new class of persons as for those already insured, the profession—which when juveniles were brought in had pressed that the capitation fee should be the same for them as for adults—would be in a strong position to claim the same fee for dependants when these in due course were brought in.

The Committee eventually agreed to three resolutions. The first was that the Minister of Health should be informed of the Committee's dissatisfaction at his action in introducing legislation for raising the income limit for non-manual workers before the Committee had been consulted on the merits of the proposal. The second was that, as the Government had decided to legislate in order to bring into national health insurance a new group, the Committee desired to reopen the question of the adequacy of the existing basic capitation fee and to have it determined now, either as a prior issue or as part of the settlement of a general capitation fee for all insured persons, including the new group. By its third resolution the Committee decided to make no objection to the raising of the income limit for non-manual workers to £420, provided that the consolidated capitation fee in respect of both the existing and the newly added insured population was adequate. It was also agreed that a Conference of Panel Committees should be called so that practitioners could express their views on the subject, and that the Minister should be approached and informed that it was proposed to call such a conference.

Other Business

It was reported that the Ministry of Health had agreed to the Committee's claim for an increase in the ordinary portion of the Central Mileage Fund at the rate of £22,575 per annum as from July 1 next.

Representations had been made to the appropriate Government Departments in favour of medical practitioners being permitted to stock and issue war injury continuation certificates. It was found that in many cases the Assistance Board was willing to take a risk, in the interest of speedy payment, in the case of first certificates, and men were collecting such certificates from their doctors and being paid on them. After the first certificate, however, the question of title to benefit had to be ascertained before a man was given a blank certificate to take to his doctor, and there were serious difficulties in the way of allowing practitioners to stock and issue continuation certificates. The Assistance Board had agreed that if its attention was drawn to any delay in issuing medical certificates in any area to approved cases it would immediately take the matter up.

At the recent first meeting of the Medical Planning Commission the Insurance Acts Committee was asked to nominate four practitioners (one of whom should be engaged in colliery practice) for co-option to the Commission. The Committee made the following nominations: Dr. D .O. Twining (Salcombe, Devon), Dr. P. V. Anderson (Shildon, Co. Durham), Dr. I. G. Innes (Hull), and Dr. D. J. B. Wilson (High Wycombe).

The Committee agreed to advise practitioners engaged in national health insurance work to use the War Emergency Formulary now in course of preparation.

SOCIALIST MEDICAL ASSOCIATION

The following resolutions were passed at the annual general meeting of the Socialist Medical Association on May 25.

Employment of Refugee Doctors

That in view of the recent appeal for a thousand doctors from the United States and the decision to employ fourth and fifth year medical students as house officers, this meeting protests most strongly against the Government's failure to make use of the medical services of the anti-Fascist refugee doctors in this country. Since only about 100 of the 1,400 now in England are being allowed to use their medical skill and training, we demand that there should be an immediate speed-up of the machinery to effect the registration and employment of eligible alien doctors, and that those now employed on demolition and construction work in the Pioneer Corps be released for work in which their medical experience can be used.

Factory Medical Officers

That this meeting considers that the policy at present supported by the Ministry of Labour and National Service of

appointment of factory medical officers by factory managements would be improved upon, in the interests both of the workers and of the medical profession, by introducing a scheme whereby these officers would be employed by and responsible to a local or central authority and their duties co-ordinated with the work of the local medical officers of health.

EMPLOYMENT OF DOCTORS OF ENEMY NATIONALITY

The Minister of Health states (Circular 2405) that it was not intended that the phrase "total medical staff" in paragraph 2(c) of Circular 2312 (*Supplement*, March 22, p. 38) should be limited to resident medical staff. Visiting medical staff normally attached to the hospital may be included as well as the total resident medical staff employed in the hospital. In a hospital in which the medical staff includes at least two *resident* doctors of British nationality it will be permissible to employ one doctor of enemy nationality, even though the total medical staff may be less than five (in a hospital with fewer than 100 beds) or ten (in a hospital with 100 beds or over).

RATIONING OF CLOTHING AND SURGICAL GOWNS.

The Board of Trade has stated that under present arrangements coupons must be surrendered for the purchase of operating gowns and white surgery coats worn by surgeons, doctors, and dentists. These garments are not covered by the term "workmen's overalls." The Board adds that the question of making some concession is under consideration. In the meantime the number of coupons required for these garments has provisionally been fixed at six. In the case of similar garments required for use in hospitals, practitioners should be able to obtain them through the special arrangements which have been authorized to enable hospitals to get supplies of certain articles coupon-free. Hospitals will give the trader a certificate specifying the goods needed and stating that they are for use in a hospital.

Correspondence

Capital Value of Practices

SIR,—A State service may be near at hand or far off, but before any such service is contemplated the first demand that the B.M.A. should make is that the capital invested in a practice should be returned, not necessarily on what the income is to-day but the actual amount paid for the practice at any time. This money represents a man's capital and often his life savings or borrowed money. No person in a democratic country should have this—probably the only source of income for his wife on his decease or capital for starting off his children in careers—confiscated. In no other business or profession is a business valued at nothing. A good practice has always been worth about two years' purchase, and for security of income it is probably worth more when compared with the purchase value in other professions and business.

Some correspondents in the *Supplement* give as their reason for seizure of capital values the fact that better hours and conditions of work, holidays, locumtenents in illness, and a pension will more than compensate. The opposite view can now be expressed. Many practitioners make by hard work over £2,000 a year; the most we shall be likely to get under a State service will be £1,200 to £1,500. It must be logic that capital should be returned if one is forcibly to have one's income reduced and one's *freedom in work removed*. No pension can compensate these two.—I am, etc.,

E. H. WALKER, M.B., B.S.

Torrington, Devon, June 15.

Why Save Petrol?

SIR,—Why save petrol? At this stage of the war it is proposed to hold a parade and march past of A.R.P. services in this area, at which the Regional Commissioner will take the salute. Half the authorities concerned were opposed to the idea, which was proceeded with on the casting vote of the chairman—a county official. It is proposed to have rehearsals, which will involve sending eight or nine vehic from this district a matter of twenty miles on seven occasio and the seven other authorities will have to do likewise. Th will be the cars of hordes of officials from the county authorit those of the heads of the local authorities and their clerks be presented, and the commissioner's car will have to bri him from his Olympian abode, and we shall march past h in completely bogus array in uniforms borrowed for t occasion, as we have not yet been equipped with our own.

All this would be mildly amusing were it not for the fa that, all told, over 500 gallons of petrol are going to be wast on a project whose value towards the war effort is exactly n I must confess that when I think of the difficulty I have getting a bare minimum of petrol to carry on my practice a that here is enough petrol to last me for nearly a year bei thrown away on a completely fatuous performance such as th rage and disgust are my uppermost feelings and not amus ment.—I am, etc.,

Stokesley, Yorks, June 14. H. M. MACGILL.

Postgraduate News

The Fellowship of Medicine announces the following courses for Fi F.R.C.S. candidates: (1) Revision course at Royal Cancer Hospital, dai 10 a.m. to 1 p.m., July 7 to August 1; (2) Practical operative surg course at Royal Cancer Hospital, Mondays, Thursdays and Fridays, 2 p.m July 7 to August 1; (3) Week-end course of clinical demonstratio Saturday afternoon and Sunday morning, July 12 and 13, at King Geo Hospital, Ilford; (4) Urology course at Colindale Hospital, Thursda 2.30 p.m., August 7 to 28.

A series of lectures on "War Surgery of the Chest" will be given at t British Postgraduate Medical School from Monday to Friday, July 7 to (both dates inclusive), beginning at 10 a.m. daily. The fee for the cou is £1 1s. Officers of the armed forces wishing to attend without payme should apply through their respective Director-Generals. Applications tickets should be addressed to the Dean of the British Postgraduate Medi School, Ducane Road, W. Further war surgery courses will be held follows: Beginning Monday, July 21, "War Surgery of the Nervous System August 11 to 22, "Operative Surgery in Wartime"; Beginning Monda September 1, "War Surgery of the Extremities."

WEEKLY POSTGRADUATE DIARY

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATIO 1, Wimpole Street, W.—*St. Mary (Islington) Hospital*, Highgate Hill, N Wed., 2 p.m., Final F.R.C.S. Clinical Course.

DIARY OF SOCIETIES AND LECTURES

ROYAL SOCIETY OF MEDICINE

Annual Meeting of the Society.—Tues., 5 p.m. To elect Officers and Counci

DAVYHULME MILITARY HOSPITAL MEDICAL SOCIETY.—Thurs., 3 p.m Mr. Graham-Bryce: Injuries of the Chest. Medical men and women any of the Services, including civilian, will be welcomed.

VACANCIES

EXAMINING FACTORY SURGEONS.—The following [illegible] announced: Golspie (Sutherlandshire); Coventr[illegible] Applications to the Chief Inspector of Factories, [illegible], S.W.1, July 1.

APPOINTMENTS

DUTHIE, E. W., M.B., Ch.B., Examining Factory Surgeon for the Crude District (Aberdeenshire).

KITCHIN, KATHLEEN, M.B., B.S., Advisory Medical Psychologist, Wiltshi County Council.

SPROTT, NORMAN A., D.M., M.Ch., F.R.C.S., Medical Superintenden St. Columba's Hospital, Swiss Cottage, N.W.

BIRTHS, MARRIAGES, AND DEATHS

The charge for inserting announcements under this head is 10s. 6d. This amount should b forwarded with the notice, authenticated with the name and address of the sender, and shoul reach the Advertisement Manager not later than the first post Tuesday morning to ensur insertion in the current issue.

MARRIAGES

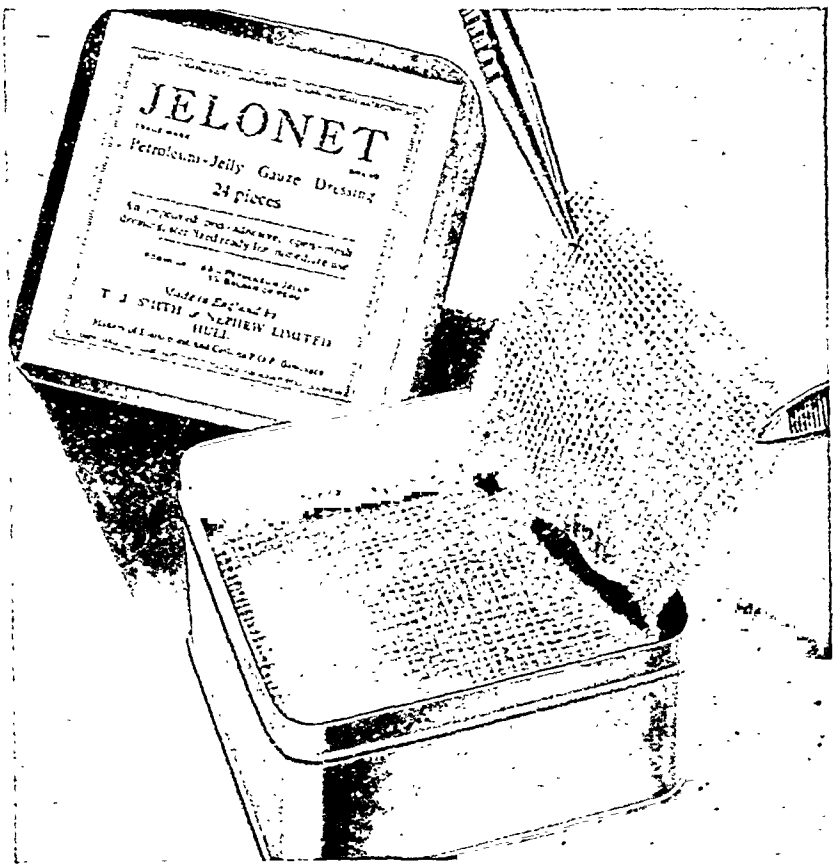
O'DONNELL—DILLON.—On April 14, at Church of Christ the King, Salthill Galway, Michael O'Donnell, M.D., M.R.C.P.I., to Moya Dillon, M.B.

STRATON—ADAMS CLARK.—On June 13, 1941, at Exmouth, very quietly Capt. Charles Noy Straton, R.A., son of the late Lieut.-Col. C. H. Straton R.A.M.C., and Mrs. Straton, of 2, Trinfield Avenue, Exmouth, to Evangelin Adams Clark, M.D., B.S., daughter of the late William Adams Clark M.D., and Mrs. Adams Clark, of Penge.

DEATH

HARVEY.—On June 17, 1941, at 4, Winn Road, Southampton, aged 67.

Local and E.M.S. hospital authorities are asked in a Ministry of Health circular to draw the attention of medical staff and others to the urgent need for conserving petrol. A reduction has had to be made in supplies, and everything possible should be done to see that the use of motor vehicles is restricted to the minimum necessary for the effective working of the hospital.



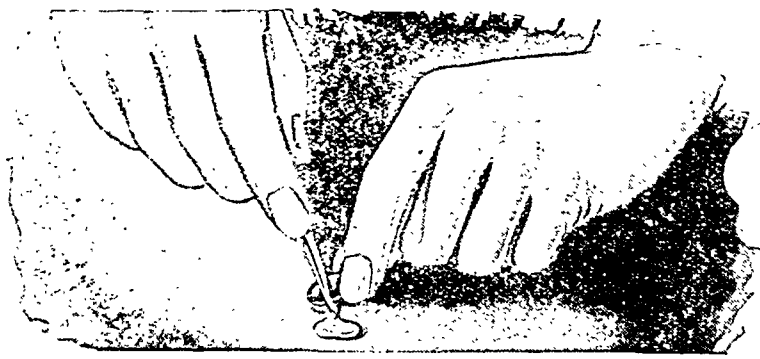
'JELONET' (TULLE GRAS) PETROLEUM-JELLY GAUZE DRESSING is made from a specially woven open-mesh gauze, evenly saturated with petroleum jelly and Balsam of Peru, and is packed in sealed containers of 24 dressings sterilised ready for immediate use.

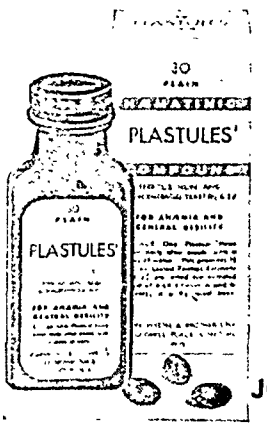
'Jelonet' is indicated for Skin-Grafts, Compound Fractures, Burns etc., as a non-adherent dressing to promote granulation. The open-mesh dressing encourages free escape of discharge, and ensures ventilation for skin-grafts and young epithelium, with minimum trauma to granulations.

Uniform saturation with petroleum jelly prevents serious rise of temperature due to toxic absorption, secondary dermatitis of the surrounding skin arising from irritating discharge, and also permits ready extrusion from deep wounds.

Obtainable through your usual Surgical Supplier, 5/2d. per tin of 24 dressings. Special prices available to Hospitals. Made by the makers of 'Elasticplast' and 'Cellona.'

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BRAND HÆMATINIC COMPOUND REGD.

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ARCHIVES OF DISEASE IN CHILDHOOD

Vol. 16. No. 86. June, 1941

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Royal College of Physicians

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thing more than the mere fitful consultation of voluntary hospitals by municipalities imposed by Sec. 182 of the Public Health Act, 1936, was required, and attention was drawn to the advocacy of this policy expressed by the Minister of Health (then Mr. Neville Chamberlain) immediately after the passage of the Local Government Act, 1929. The response to this appeal by local authorities was reluctant and variable. In some areas, such as Manchester and Oxfordshire, rapid progress was made, and it was in the latter area in 1935 that Lord Nuffield interested himself in the problem. Impressed with the success of the Oxfordshire scheme, foreseeing the precarious position with which the voluntary hospitals would be faced after the war, and conscious of the irreversible change in hospital administration which must emanate from the centralized wartime system of the Emergency Hospital Service, Lord Nuffield approached the Minister of Health (Dr. Walter Elliot) in November, 1939, with the proposal to create a Provincial Hospitals Trust to which he would donate one million share units in Morris Motors, Ltd. It was made clear from the beginning that Lord Nuffield had in mind a scheme of regionalization after the manner suggested by the Sankey Commission, but more comprehensive in its scope by incorporating municipal to the same extent as, and on like terms with, the voluntary hospitals. The Minister cordially approved and a Board of Trustees was appointed. The Board is charged with the double function of promoting regional and divisional councils, with financial aid at their inception, and of affording monetary aid to individual hospitals (not exclusively voluntary hospitals) through approved regional or divisional councils. To assist them in the initial stages the Trustees have embodied the Provisional Central Council, established by the British Hospitals Association, in the Provincial Hospitals Regionalization Committee of the Trust. This committee is provisional, and it is contemplated that it will consist mainly of representatives of regional councils as soon as the sixteen or seventeen of these come into being. A Medical Advisory Council has also been appointed under the chairmanship of Sir Farquhar Buzzard, who is sharing with his capable and energetic colleague Alderman W. Hyde, secretary of the Trust, a large part of the burden of setting the work on foot. This medical body, which is representative of several specialisms in medical science, is, we understand, already addressing itself to particular problems of co-operative medical work in wide areas.

The Trust, which does not transgress on the area of the King's Fund for London voluntary hospitals, has called conferences and meetings in the regions outlined by the Sankey Commission, and good progress had been made with the establishment of some of the regional and divisional councils. In other areas, however, the spirit of separatism dies hard. A minor difficulty arises in connexion with certain hospitals for limited communities whose constitutions preclude admission, by way of transfer for relief of a bigger hospital, for instance, of patients who do not belong to that community. The main obstacle, however, is the reluctance of some local authorities to co-operate, perhaps due to a suspicion that this is a deep-laid scheme on the part of voluntary hospitals to tap public financial resources and at the same time to dominate hospial policy and management. This apprehension should be dispelled. It might be worth while to reassure local authorities at once by reconstituting the provisional central committee in such a way as to give them larger representation upon it without the inevitable delay in waiting for the creation of all the regional councils, but, of course, on the understanding that the authorities or associations of authorities represented accept the principle of regionalization and are prepared to promote it.

The timely letter which the present Minister of Health, Mr. Malcolm MacDonald, has sent to Mr. Goodenough[1] reveals the same interest in the subject shown by his predecessors. He approves of the two points on which the Trust is concentrating—namely, on the one hand, building up the future hospital service on existing foundations and finding the right relation between local authorities and voluntary hospitals; and, on the other, promoting a system not constricted by existing local government boundaries. It is to be hoped that hospital authorities will take this letter as a sign that the present time is not inopportune for planning the future—a common excuse for non-cooperation. The Trust, it may be assumed, will appreciate the disinclination of the public in this country to accept any arrangement which involves bureaucratic central administration or the expenditure of public moneys by non-elective bodies. It will also be well advised to limit its operations to the hospital field and to remember that local authorities provide many medical and public health services which are not based on hospitals. On the wider topic of local government the Minister of Health has recently put the matter in these words: "No doubt there must be some changes in the organ of local government in the future. But the principle of self-government in local affairs is an essential part of our democracy; it is, indeed, a foundation of the sound democratic training and practice of a free people. It must be preserved and supported." The problem is to combine public representation with the utilization of disinterested expert knowledge and experience.

AN EPIDEMIC OF BRUCELLOSIS

Those who are proud of their powers of solving detective riddles will find their ingenuity taxed by an occurrence reported by Forest Huddlesdon and Munger[2] from the Michigan State College, East Lansing, Michigan. It appears that from December 10, 1938, to February 10, 1939, there occurred at the college forty-five clinical cases of brucellosis, of which one ended fatally. Of the forty-five patients forty-one were students, one an attendant in the animal house, one a typist, one a plumber, and one a salesman. *Brucella melitensis* was isolated from the blood of the majority, and as this organism has not been recovered from animals in Michigan for some years the source of the infection was undoubtedly a laboratory in the basement of the Institute, where work was being carried out on *Brucella*. All milk used by the students at the college was pasteurized and no evidence that it was infected was obtained. All the students, with two exceptions, had been taking courses of bacteriology during the autumn term, but no *Brucella* cultures had been handed

[1] *British Medical Journal*, 1941, 1, 94.
[2] *Amer. J. publ. Hlth.*, 1940, 30, 944.

DOUGLAS HUBBLE AND G. R. OSBORN: ACUTE BRONCHIOLITIS IN CHILDREN

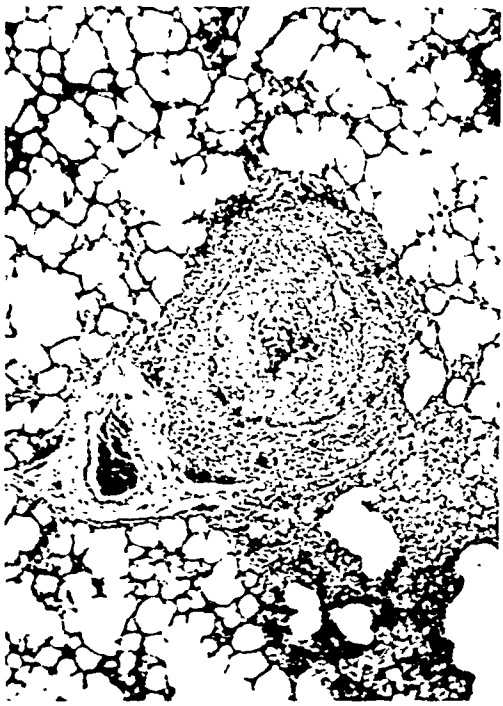


FIG. 1.—A bronchiole 0.7 mm. in diameter. Complete destruction of lining epithelium and plug of almost pure mucus, though there are no glands in the wall. General emphysema and localized alveolar changes well shown.

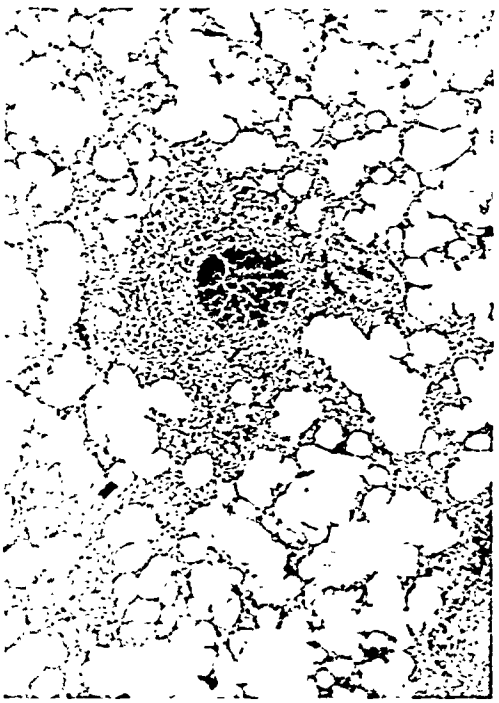


FIG. 2.—Respiratory bronchiole blocked by purulent plug. Peribronchiolitis, interstitial alveolar changes, and general emphysema.



FIG. 3.—Small bronchus blocked by a mucous plug. Damage to lining epithelium and active secretion by mucous glands. Mucicarmine stain.

A. B. SLACK: MULTIPLE FOETAL ABNORMALITIES



Showing herniation of liver, heart, and brain, and cleft palate and bilateral harelip. Placenta adherent to brain.

WILLIAM C. SMITH: UNILATERAL TWIN ECTOPIC PREGNANCY



H. T. LAYCOCK: IRREDUCIBLE INTUSSUSCEPTION IN A BABY, TREATED BY RESECTION



FIG. 1.—Anterior view.



FIG. 2.—Posterior view.

H. T. SIMMONS: PROSTHETIC ULCER OF THE MOUTH



FIG. 1.—Prosthetic ulcer of mouth. Note atrophy of alveolus.

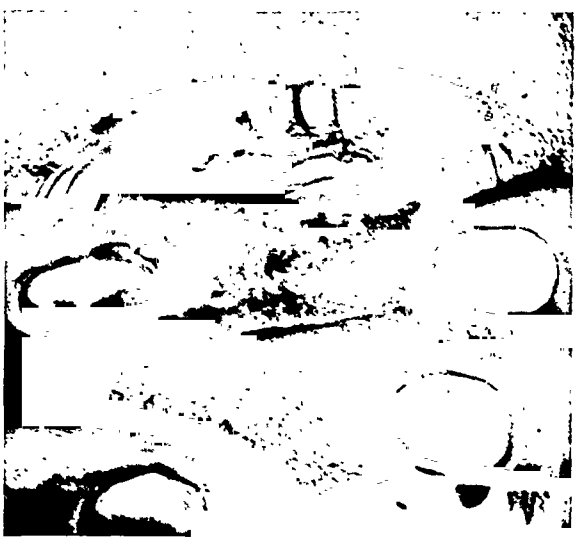


FIG. 2.—Prosthetic ulcer of mouth. With denture *in situ*.

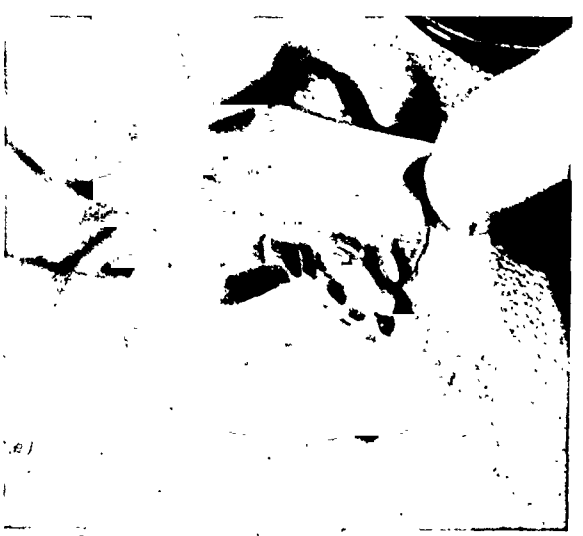


FIG. 3.—Prosthetic ulcer of mouth. Upper lip type.

good for six hundred years more. But with the coming of totalitarian war local government has moved into place as one of the great fighting Services. Every town hall is a sort of military headquarters. The tasks of corporations and even of village councils have grown out of all recognition, not merely in extent but in shape. Civil defence services, the administration of air-raid shelters, hospital provision, casualty services, the evacuation of children, the reception of refugees, food control, the war-time lighting of streets, removal of debris and salvage of material, extension of police, fire, and other protective services to meet the conditions of emergency—all these have imposed immense tasks upon local government officials. In addition the normal activities have had to be continued in changed and strained circumstances—health services, education, public cleansing, housing and slum clearance, libraries, open spaces, supervision of fairs and markets, foods and drugs, electricity and gas supply, smoke abatement, welfare of the blind. During the past year there were thirteen new Acts of Parliament affecting local government, and, what are more onerous, two hundred statutory rules and orders, relating to aliens, to civil defence, to highways and road traffic, to fire brigades, and a host of other subjects.

The way in which local government officials have risen to the occasion has won general public recognition, and the late Minister of Health, in a preface to the present volume, adds his meed of praise. The *Year Book*, which with less capable editing might have been chaotic, is well arranged in nearly fifty sections, not overladen with statistics, and at the end there is a directory giving the fullest details—population, rateable value, names of councillors and officers, and every conceivably useful piece of information—relating to the sixty counties, the four hundred boroughs, the thousand urban and rural districts in England and Wales alone, not to speak of Scotland, Northern Ireland, and Eire. This great local civil service has a chronicle worthy of its pride.

SCENES OF MEDICAL LIFE

Fingal's Box. By Harley Williams. (Pp. 382. 8s. 6d. net.) London: Jonathan Cape. 1941.

Scenes of medical life appear to have an attraction for the average reader of novels provided they unveil sufficiently the mysteries of the operating theatre and the laboratory. The medical man usually finds them pitched in too melodramatic a key, and is often exasperated by gross inaccuracies in novels by laymen. Dr. Harley Williams in *Fingal's Box* naturally avoids both these pitfalls, though we were a little surprised that his distinguished researcher stained his sections *after* they had been embedded in paraffin, and rather incredulous of the senior surgeon to a London hospital who obtained his experience in the South African War yet still thought that any surgeon should be able to carry all the instruments he required in his pocket! We also shared the polite scepticism of the hero's colleagues when he announced his cure of cancer by thyroid and pituitary extracts. But these are trifles, and the main theme of the conflicting claims of research and practice, the clash between love and duty, is attractively developed. There are vivid sketches of student life, the hooliganism accompanying an Edinburgh Rectorial election, the macabre surroundings of "midwifery on the district," and the ritual of the resident staff quarters. We hope, however, that the picture of the horrible conditions in the local infirmary of a North Midland industrial town is not drawn from life. The author's description of the tense excitement there over the League football matches adds point to the saying that in England a revolution would never be allowed if it interfered with cup ties. The story is well told and its interest actively maintained; many recognizable types of students and doctors walk through its pages, and we are left with the impression that it takes all sorts to make a medical world.

Notes on Books

Clinical Pellagra, by Prof. SEALE HARRIS of Alabama, is a work of collaboration in which ten other people have taken part. Prof. E. V. McCollum, in a brief foreword, describes it as a "philosophic treatment of clinical and experimental data of many kinds, contributed by many able workers who have contributed to the development of our knowledge of the biochemistry of nutrition and of the biologic agencies which act in conjunction with malnutritional states to undermine and pervert physiologic functions of certain types." It is not until Chapters 18 and 19 are reached that the editor-in-chief gives his description of the symptomatology and clinical manifestations of pellagra, and the general presentation lacks sequence. This book, of nearly 500 pages with many illustrations, is published by Henry Kimpton at 35s.

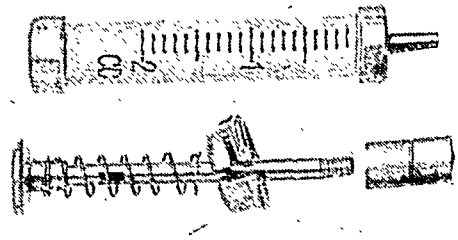
Principal Drugs and their Uses, by A. L. MORTON (tenth edition, Faber and Faber, Ltd., 2s. 6d.), is a pocket volume intended for the use of nurses. All drugs in common employment are listed in alphabetical order and the composition and uses of each are stated in a few lines. Inspection of the volume shows that care has been taken to keep it up to date. The number of editions through which the book has passed proves that it meets a general need.

Preparations and Appliances

SYRINGE WITH PISTON SPRING

Mr. E. LAMING EVANS, F.R.C.S. (London, W.1) writes:

The syringe illustrated, with piston spring, was manufactured by Allen and Hanburys from a pattern made for me by our instrument-maker at the Royal National Orthopaedic Hospital from a small length of a toe-upraising spring and a stock syringe. The spring is easily detachable and can be sterilized with the rest of the syringe. The syringe is assembled by unscrewing the plunger, threading the spring on the piston rod, and rescrewing the plunger.



By depressing the piston rod a negative pressure is exerted in the barrel, and the detection of fluid in vein, cold abscess, pleural cavity, or spinal theca is facilitated. I find it easy to direct the needle by holding the barrel with finger and thumb while the ring finger rests against the flattened end of the piston rod. In some syringes the end of the piston rod where it passes to the screw thread has a shoulder; if so, the diameter of the spring must be sufficient to pass easily over the shoulder on to the piston rod. It is easier to fit the barrel cap on to the piston rod before the plunger is screwed on. The principle of the spring is to make a small negative pressure in the barrel just sufficient to cause fluid to flow into it. The barrel is filled by withdrawing the plunger in the usual way. If the spring is strong enough to fill the barrel as in a dental drainage syringe, control of the piston rod is difficult and the direction of the needle into a small vein hazardous.

I hesitate to think that this simple addition to a syringe has not been suggested before; but if it has been, I have not heard of it.

VITAMIN THERAPY

THE DEFECTS OF MODERN DIET

Views on man's nutritional requirements, at one time so hotly debated, have now crystallised to such an extent that there is no longer any substantial disagreement. For example, authoritative publications [1,2,3] agree that modern diets are often seriously deficient in many respects; and they are unanimous in stressing the great importance of those "protective" food elements which are provided by fresh fruit and vegetables, wholemeal bread, milk and dairy products generally, and fish.

Unfortunately, in spite of this agreement, the day has not yet arrived when the physician can rely upon patients following general advice about "good mixed diets," simply because the ingrained habits of the population effectively prevent the more widespread use of the protective foods, quite apart from economic considerations and other practical difficulties peculiar to the times.

The Need for Supplements

Experience has shown that vitamin and mineral deficiences are almost always multiple. This makes it very desirable to use a well-balanced nutritional supplement containing, in the one preparation, the several substances with synergistic action. Vitamin D has its fullest effect when the existing calcium and phosphorus deficiencies are fully rectified. Iron is best utilised for haemoglobin formation when given with certain trace minerals and vitamin C.

Dietary restrictions, whether they are required temporarily during fever or over long periods as in the treatment of peptic ulcers—or arising through anorexia—may often prove the unwitting cause of vitamin and mineral deficiencies. The vitamins of the B group, for instance, are particularly liable to be inadequate in invalid diets. The supply of available iron, too, may be seriously curtailed when green vegetables and other sources have to be forbidden.

A supplement containing *all* the vitamins and minerals which are likely to be deficient is therefore a valuable adjunct to treatment in sickness and convalescence.

The Economies of Dietary Supplements

In cases of acute illness it is natural that the cost of the necessary remedies should not be regarded as of particular importance. But in the all too prevalent cases of dietary deficiencies, where prolonged treatment is needed, the cost of the prescription has to be considered.

There are two points with a direct bearing on this question of economics. First, as has been said, these deficiencies are almost invariably multiple; and, second, certain of the protective factors require the presence of others if they are to be fully effective. Considering these two points, the physician has hitherto been faced with the unwelcome necessity of prescribing simultaneously more than one supplement—*e.g.*, liver oil, calcium, iron, etc.—the inconvenience and total cost of which may prove an obstacle to the faithful observance of his directions.

Dental Disease and Dietary Deficiencies

If any confirmation should be needed for the now generally recognised correlation between the incidence of dental disease and dietary deficiencies, it is provided by the fact that dental caries is apt to develop rapidly in women during the period of pregnancy and lactation.

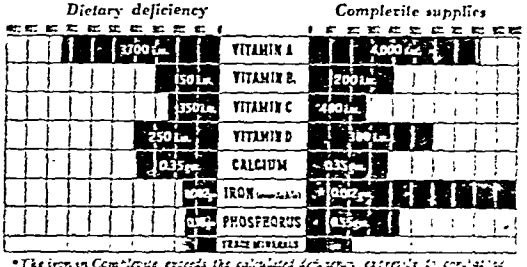
Experimentally there is a close relationship between the structure of the teeth and the supply of calcium, vitamin D and vitamin A. Dental disease and these particular dietary deficiencies are both widespread nowadays, especially among families where expenditure on food is restricted. Resistance to caries throughout life is known to be greater for teeth unharmed by deficiencies during their development. The benefits of correcting such deficiencies in children's diets are therefore not limited to those noticeable at the time. By improving the structure of the teeth—and possibly of other tissues also—they may prove of even greater value in later life.

The First Complete Vitamin and Mineral Supplement

Complevite provides, in a single preparation, vitamins A, B1, C and D with calcium, iron and phosphorus in carefully balanced proportions. The formula of Complevite is based on a careful consideration of the actual deficiencies which are found in ordinary diets; so that where dietary restrictions are unavoidable the dosage may be increased with advantage at the discretion of the physician.

Complevite affords a comprehensive nutritional supplement at a minimum cost.

It will be seen from the chart that Complevite contains all the important protective substances *in amounts carefully related to the known deficiencies.* It has, therefore, a wide field of clinical use.



*The iron in Complevite exceeds the calculated deficiency, as regards its correlation to nutritional anaemia so common in children and in women of childbearing age.

Full particulars and complimentary bottle of tablets on request to Vitamins Ltd. (Dept. B.C.P.), 23, Upper Mall, London, W.6.

Ref. 1.—"*Food, Health and Income.*" Macmillan, London, 1936.
Ref. 2.—"*Feeding the People in Wartime.*" Macmillan, London, 1940.
Ref. 3.—"*The Nation's Larder.*" Bell, 1940.

Milton treatment of wounds

This treatment proceeds by three stages:—

1. MILTON 50% SOLUTION

Thorough cleansing and mechanical removal of all infected plasma proteids, necrotic tissue and pus. Milton (up to 50% solution) dissolves this detritus and rapidly sterilises the clean surface. As a hypertonic saline it produces profuse fluid exudation.

> *"The process of mechanical cleansing is of "most advantage in wounds containing sloughs "and is well served by solutions containing "chlorine or liberating oxygen, both of which "tend to disintegrate and detach necrotic "tissue."—Lancet, May 4, 1940.★*
>
> *"The most rapidly acting antiseptics are the "halogens and those liberating nascent "oxygen."—Lancet, April 27, 1940.★*
>
> *"Profuse fluid exudation can be deliberately "produced by applying hypertonic solutions "of salt."—Lancet, May 4, 1940.★*

2. MILTON 5% SOLUTION

The clean wound is kept sterile by an isotonic antiseptic protective layer, applied by dressing, irrigation or immersion. In this mild aqueous medium a normal granulation proceeds and exudation ceases.

> *"The proper vehicle for an antiseptic to be "applied to a wound is water, and the solution "should if possible be rendered isotonic." —Lancet, May 4, 1940.★*

3. MILTON ½% SOLUTION

The Milton is then reduced to ½ per cent., at which dilution the hypochlorite has been found to actually stimulate cell-division and tissue-growth, with consequent rapid healing.

After débridement, this course of treatment is normally painless.

This therapy cannot be carried out with full success by the use of Dakin's solution or of Liq. Sod. Chlorin., owing to their causticity, their deficient saline content and to their varying strength of hypochlorite.

★ *Prevention and Treatment of Wound Infection. Action of Antiseptics on Wounds.*

Milton the Electrolytic Hypochlorite

stable, non-caustic and of standard strength (1%)

MILTON PROPRIETARY LIMITED • JOHN MILTON HOUSE LONDON N7

BRITISH MEDICAL JOURNAL
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INCIDENCE OF CANCER OF THE LARYNX

Maxwell and Hogg[1] in 1933 found from a study of the Registrar-General's returns that in Great Britain between 1911 and 1930 there had been a steady increase in the mortality from cancer of the larynx, so much so that the figure for 1930 was more than double that for 1911. Moreover, the proportion of cancer of the larynx compared with the total incidence of malignant tumours had risen from 1.29 to 1.92%. In this form of cancer the mortality does not represent the true incidence of the disease, because nowadays a large proportion of cases are cured in the sense that, without evidence of its recurrence, the patients succumb years later to some other disease. In cancer of the oesophagus, where Maxwell and Hogg found a fall of from 4.05 to 3.90%, the mortality represents the incidence almost exactly, for cure of the disease in this situation is so uncommon at present as to be almost a medical curiosity. Unquestionably, therefore, the incidence of cancer in the larynx increased even more than the figures of Maxwell and Hogg indicate, even allowing for the inclusion in the figures of some cases of cancer of the epiglottis and sinus pyriformis. Chevalier Jackson and Chevalier L. Jackson[2] have undertaken a similar inquiry into the incidence of laryngeal cancer in the United States. Taking cancer of the larynx to mean cancer of the vocal cords, they have found a similarly increased incidence, both absolute and relative to other cancers. Parallel with this they have found an even higher increase in the incidence of cancer of the lung.

In the United States the statistical investigation presents certain difficulties which do not arise in Great Britain, because in 1900 the Federal surveys of vital statistics included only eleven States. The statistics therefore are available for the whole of the U.S.A. (divided into five geographical sections) only since 1930; and even now Texas is not included. If statistics over a long period are required, then only those from the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Michigan, Indiana, and the District of Columbia —the registration States of 1900—can be used. In these States the total deaths from cancer per 100,000 increased from 68.3 in 1900 to 120.6 in 1935. Although these figures undoubtedly show an increased incidence, account will have to be taken of such factors as more accurate diagnosis, increased longevity, more careful registration, etc. There is therefore special significance in a table quoted by the Jacksons from the Bureau of the Censor in which deaths from cancer of the larynx are compared with the total deaths from cancer throughout the years 1934 to 1938. Because this period is short and of recent date the errors mentioned are eliminated, and the figures show a steady rise from a total incidence of cancer of 134,528 with 1,100 in the larynx in 1934 (a proportion of 1 : 122) to a total of 149,214 with 1,340 in the larynx in 1938, the proportion changing to 1 : 111. Nearly all writers agree that about 90% of cases of intrinsic laryngeal cancer occur in males, and the figures from America correspond fairly well with this. A curious exception to this 10% incidence in women is mentioned by Tapia,[3] who believes that cigarette smoking is an important factor in the aetiology. In his own 993 cases there were only six female patients, and four of these were smokers. In Spain women seldom smoke, but they do so commonly in Cuba, where Herman Seguí observed thirteen cases in women among seventy-five cases, and all the thirteen were heavy smokers.

During recent years the incidence of cancer in another part of the respiratory tract—the lung—has risen even more steeply. Here again a correction is required between the difference of morbidity and mortality, for cancer is often curable in the larynx but seldom in the lung. The true increase in the incidence of these two forms of respiratory cancer must be more nearly parallel than the figures indicate. Cancer of the mouth and the pharynx does not show any increase, the American figures remaining remarkably steady for each year of the period 1934-8.

The cause of this remarkable increase of cancer in the larynx is naturally the subject of inquiry. Some years ago Dr. Chevalier Jackson[4] expressed the opinion that vocal abuse was an important aetiological factor. The Jacksons now say nothing of this, but express the opinion that alcohol and tobacco play an important part. This seems, however, to be only an opinion, and no supporting evidence is submitted. The statistics recorded by Tapia are, however, in agreement with this view, though they can scarcely be taken as scientific proof. The statistics collected by the Kennaways[5] have a more scientific basis. They noted that, according to the census figures for the twelve years from 1921 to 1931 inclusive, out of a male population of 11,916,285 there were 9,472 who died from cancer of the larynx. In the term "cancer of the larynx" they included the extrinsic form on the epiglottis, aryepiglottic folds, fossa pyriformis, and even post-cricoid carcinoma. The incidence in sixty-three occupations was noted, and the number of deaths that should occur if cancer were evenly distributed through all occupations, in proportion to the numbers employed, was compared with the actual deaths. The result was stated as a ratio of 100 registered deaths. Barmen and cellarmen easily head the list. For barmen the calculated deaths were 8.3, the actual number 39, and the ratio 469. For cellarmen the calculated deaths were 4.4, with 14 actual deaths, giving a ratio of 317. At the other end of the list come blast-furnacemen and labourers. The calculated deaths were 7.4, the actual deaths 3, the ratio 40. Gas stokers and coke-oven chargers, however, came high on the list with a ratio of 186. Whether this can be taken as proof that some occupations induce a greater liability to cancer of the larynx seems doubtful. The occupation of supplying beverages containing alcohol does not nowadays necessarily imply an excessive consumption of them though formerly it undoubtedly did. Although Tapia and the Kennaways may be cited to provide some

[1] *Lancet*, 1933, 1, 1064.
[2] *Arch. Otolaryng.*, Chicago, 1941, 33, 145
[3] *Rev. cient. y Amer. Larynx*, 1939, 31, 269.
[4] *Ann. Surg.*, 1925, 77, 1.
[5] *J. Hyg. (Camb.)*, 1936, 36, 238